# **Building Resilience by Understanding Reasons for Collapse:** A Study of Societal Futures

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# Abstract

The primary area of investigation is resilience and its shadow counterpart societal collapse. Our research explores what resilience to existential risks means for contemporary Canadian society. We analyzed historical examples of societal collapse for clues and common factors that led to their demise. We will also explore concepts and frameworks for resilience and alternate worldviews for insights into how to build resilience.

Borderless global threats like climate change pose an existential risk to all of humanity, but in varying degrees of severity around the world. For example, climate change poses long term implications globally, but some regions are already more heavily affected and face more severe consequences in the near future. We used foresight tools such as scenarios research to understand the interconnectedness of key trends as they relate to existential risks and their implications for Canada. We also collected and analyzed data from expert and non-expert interviews to understand risk perception, crisis experience, and future risk response.

An opportunity exists to decolonize our response to existential risks by incorporating alternate perspectives, worldviews, and cultural values into a framework for resiliency in a contemporary Canadian setting. For example, many Indigenous perspectives inherently incorporate non-human factors by providing an eco-centric rather than anthropocentric worldview, or models that provide alternate economic perspectives to capitalism. We examined these other perspectives and worldviews and what lessons they provide that we can apply to our current Canadian framework that will enhance our resilience as a society.

From our newfound understanding of these four key areas (historical examples of societal collapse, existential risks, resilience, and alternative worldviews and perspectives), we have identified six major themes that embody our key insights: refocusing worldviews, energy continuum, unpacking collapse, resilience framework, actual risk versus risk perception, and dominant and alternate worldviews. Our interview analysis has provided us with four areas of opportunity, and we offer practical and realistic suggestions for specific stakeholders to enhance resilience in Canadian society.

# Land Acknowledgement

We acknowledge the ancestral and traditional territories of the Mississaugas of the Credit, the Haudenosaunee, the Anishinaabe and the Huron-Wendat, who are the original caretakers of the land on which we stand, the water that we drink, and the air that we breathe; all things that when combined provide us sustenance to live and create.

Land acknowledgements are only the beginning of recognizing the struggle for Indigenous rights and the systemic oppression that many Indigenous peoples have faced and continue to face. If reflecting on land acknowledgements leads you to the conclusion that it is not enough to enact real change, take this as your call to action to support Indigenous rights in a more intentional and purposeful way: educate yourself on Indigenization and decolonization, attend a powwow, amplify Indigenous voices.

# Personal Acknowledgement

**Ashwini Gawli** was born and raised in Maharashtra, a state located in the western part of India. Her cultural heritage is deeply rooted in the traditions, customs, and values of the Maharashtrian community, who are the native speakers of the Marathi language and predominantly follow Hinduism. It shapes her identity, influences her values and beliefs, and provides her with a sense of belonging. Ashwini believes that the history of colonization, oppression, and systemic injustices inflicted upon marginalized and Indigenous communities is a painful reality that cannot be ignored. As she engages in her work, she is committed to acknowledging this history and actively incorporating decolonization theories and practices to promote healing, equity, and justice.

**Kassie Miedema** identifies as a Canadian from a European settler background. Her cultural heritage includes family roots from England, Ireland, the Netherlands (Holland as her grandparents called it) and Friesland (a Dutch province and the reason she calls her paternal grandparents *pake* and *beppe*—instead of *oma* and *opa*—unlike most other Dutch grandchildren). Kassie is a third generation Canadian. Kassie is deeply sorry for the past and ongoing histories of Dutch colonialism, the Canadian residential school system, and other acts of colonization and oppression in Canada and makes it a point to incorporate justice, equity, and decolonization practices in her work.

We recognize that, as with any work conducted by humans, we bring our biases, perspectives and worldviews whether consciously or unconsciously to our research. One of the reasons we chose to work together, including our supervisor Nabil Harfoush, was to mitigate our biases because we have very different lived experiences in different parts of the world with different worldviews. We acknowledge that there are limitations to our diversity; we come from similar professional industries (architecture and engineering), and we are all part of academia in a university setting. We have done our best to mitigate this by involving participants from diverse backgrounds, engaging in reflection and careful decision making, and by maintaining open channels for discussion.

# Acknowledgements

Thank you to our supervisor, Nabil Harfoush, who challenged us intellectually to do our best work, supported us with his kindness, and instilled academic rigor in us throughout this journey.

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# Glossary of Terms

**Affinity mapping** – The process of sorting and grouping information based on identified similarities (*What Is an Affinity Diagram?*, n.d.).

**Causal Layered Analysis (CLA)** – The analytical foresight framework that consists of four layers: litany, structures and systems, worldviews and values, and deep myth or metaphor (Inayatullah, 2009).

**Energy transition/Post-carbon economy** – Often referred to as the 'clean energy transition,' this term refers to "shifting energy production away from sources that release a lot of greenhouse gases, such as fossil fuels, to those that release little to no greenhouse gases" (Jawerth, 2020). Similarly, a post-carbon economy is one that relies on clean forms of energy such as nuclear power, hydro, wind and solar.

**Existential risk** – A crisis that has the potential to result "in a society's extinction or near-extinction, during which very large numbers of people die or scatter. Recovery, if there is one, takes centuries [...]" (Wright, 2004)

**Resilience** – The academic research group Resilience Design Lab defines resilience as the ability of a system experiencing a destabilizing event to return to a stable condition within reasonable time (N. Harfoush, personal communication, April 8, 2023).

**Societal collapse** – "the rapid, significant loss of an established level of sociopolitical complexity" (Tainter, 1988)

**Thematic analysis** – The process of identifying emergent themes from a data set (Maguire and Delahunt, 2017)

**Wicked problem** – A social or cultural problem that's difficult or impossible to solve because of its complex and interconnected nature (Rittel and Webber, 1973).

# 1.0

# Introduction

# 1.0 Introduction

The trajectory of humanity throughout history is characterized by an inexorable trend towards higher levels of political and social complexity and continual population growth, pressures under which a few historical societies have survived, and others have collapsed. The same factors leading to the disintegration of societies have recurred throughout history, and with the exponential rate of change that the 20th and 21st centuries have brought, the **resilience** of contemporary societies is now being tested. Despite growing knowledge of **existential risks**, governing bodies fail to address the root cause of these threats that could destabilize Canadian society. Existential risks are those catastrophes or crises that have yet to materialize but are nonetheless worth studying because of their potential long term and short-term impacts on the future of society. The sheer scale of the future at stake makes mitigating existential risks and achieving more resilience highly valuable to society.

The rapid rate of change driven by technological, social, and other forms of progress have made contemporary thinkers foresee an impending societal collapse as a result of threats such as nuclear weapons, resource depletion, and ecological crisis among many others. Scholars such as anthropologist Joseph Tainter and geographer Jared Diamond, who have done extensive research into reasons why societies fail, have proposed theories to explain **societal collapse**. Many of these studied societies have suffered from common failures that have been repeated throughout history due to lack of attention towards the warning signals of potential collapse. In the present global context, trends toward increasingly extractive and damaging practices in our current economic system have created a **wicked problem** that is pushing society in an unsustainable direction. Therefore, the purpose of this research is to find ways to increase resiliency to existential risks for contemporary Canadian society.

We have defined four key areas of inquiry necessary to answer our research question: historical examples of societal collapse, existential risks, resilience, and alternative worldviews and perspectives. The research explores lessons from failures by drawing on analyses and common patterns in the collapse of historical societies to reveal insights applicable to contemporary societies. The research explores perceived existential risks according to individuals and experts to better

understand their awareness of subject matter, and to understand the challenge from many perspectives. To support this exploration of existential risks, we address vulnerabilities in the water, energy and food systems that could lead to the collapse of contemporary Canadian society. The research then turns to resilience building tools and a framework for assessing a country's resilience and how those factors show up in case studies on six modern nations that overcame crises. Finally, the research investigates alternate perspectives and worldviews for insights into how Canada might increase its resilience.

The rest of this section provides a brief overview of key areas of inquiry: historical lessons, current and future risks, building resilience to those risks, and alternate perspectives as a method for building resilience. Section 2 covers the methodology we used to find answers to our research queries: interviews with experts and individuals, analysis using affinity mapping and thematic clustering, synthesis using a causal layered analysis method, literature reviews, scenario research, and limitations to this research. Section 3 provides an overview of the data collected and key insights and findings from analyzing and synthesizing the data we collected. Section 4 presents the identified areas of opportunity and proposed solutions. Finally, the conclusion covers a summary of what was learned through this research and areas for future inquiry.

Fundamental to this research is our guiding question of how to create more resilience for Canada. Resilience as it relates to whole societies is a relatively new field of study, and this area of inquiry seems especially topical in the wake of the existential threat posed by the global COVID-19 pandemic. However, the small body of existing research in these fields is often written about today's great global powers—China, France, Russia, the United Kingdom, and the United States. We hope to contribute contextual insights into how Canada can continue to thrive far into the future.

**Societal Collapse** – "the rapid, significant loss of an established level of sociopolitical complexity" (Tainter, 1988)

**Resilience** – the ability of a system experiencing a destabilizing event to return to a stable condition within reasonable time.

**Wicked problem** – a social or cultural problem that's difficult or impossible to solve because of its complex and interconnected nature.

**Existential risk** – a crisis that has the potential to result "in a society's extinction or near-extinction, during which very large numbers of people die or scatter. Recovery, if there is one, takes centuries..." (Wright, 2004)

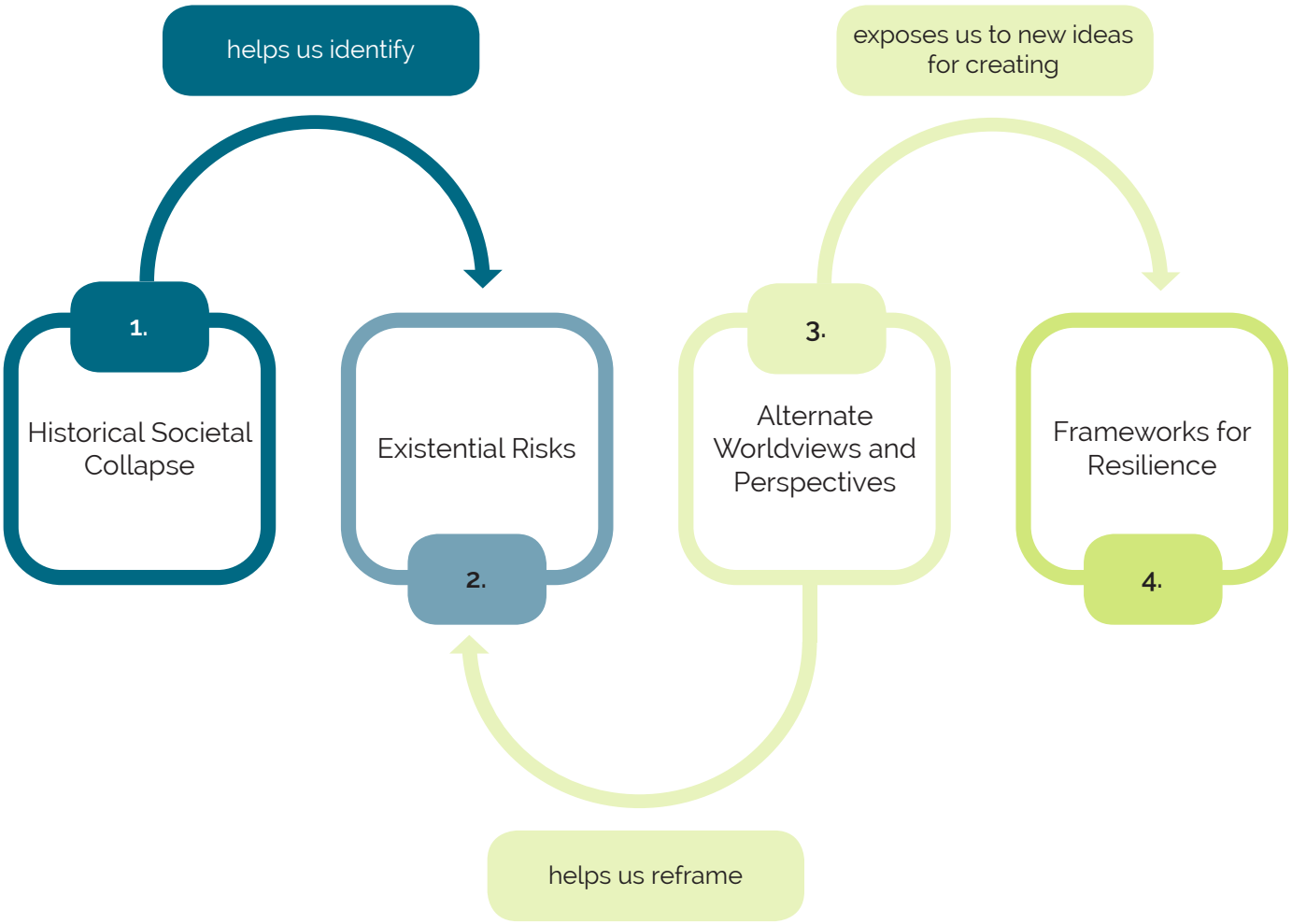



*Figure 1.1 Four areas of inquiry*

## 1.1 Key Areas of Inquiry

### 1.1.1 Historical Societal Collapse

The intent of studying historical societal collapse for our research study was to examine and interpret the underlying drivers that potentially led certain societies to collapse. We sought to decode how individuals, leaders and institutions differed in ideas and cultural practices that shaped decision-making processes that led to the demise of some societies. The disintegration of historical societies has been a recurrent theme in history as a catastrophic event having the highest social, political, and economic impact. We have found that Ronald Wright (2019) supplied a useful definition that helped us frame the scope of societal collapse we aim to focus on in our research:

> *A true collapse results in a society's extinction or near-extinction, during which very large numbers of people die or scatter. Recovery, if there is one, takes centuries, for it requires the regeneration of natural capital, as woods, water, and topsoil slowly rebuild. Therefore, when we refer to societal collapse, we are referring to collapse at the scale of a nation or significant portion of a nation that could lead to destabilization.*

Scholars have used a wide range of methods to analyze the underlying factors behind this scale of disintegration and to propose frameworks of collapse. These frameworks might offer a better understanding of how the past has shaped global, national, and local relationships between societies and people.

To answer our primary research question, applying lessons learned from the past to contemporary society is the key. To analyze contemporary society, individuals' collective actions and decision-making in the past positions us to see patterns that might otherwise be invisible in the current context. In the book *A Short History of Progress* (2019), the author Ronald Wright says, "The great advantage we have, our

best chance for avoiding the fate of past societies, is that we know about those past societies. We can see how and why they went wrong." The challenges of future behaviors of a society can be anticipated by tracing events, causes, and patterns in the past that have contributed to the current world. Similarly, in his book *Upheaval* (2019), Jared Diamond says, "If people, or even just their leaders, choose to reflect on past crises, then understanding of the past might help us resolve our present and future crises." Crises in the past varied according to geography and time but still have similarities in their nature that may help us identify similar patterns in the present.

Diamond offers two reasons to study historical examples of struggling nations, one reason is to better understand how a country may respond in the future by having a historical understanding of how that country has responded in similar situations in the past (2019). By this, he is referring to gaining cultural literacy so that one may understand the underlying drivers (cultural values) that influence a society's decision making. These drivers are useful not only for understanding the evolving geopolitics of presently existing nations, but also for extinct or historical societies in the context of societal collapse. Understanding cultural values that may have influenced poor decision making leading to collapse may provide us with useful insights and cautionary tales of what not to do today. Diamond's second reason refers to patterns that we can identify from historical examples which may be applicable to the present that may give us hints to decisions that could influence preferred outcomes to materialize.

One of the other benefits of studying historic examples is that as outsiders we can objectively assess the root cause of collapse. The explanations provided by scholars are constructed from factual evidence and hence, analyzing and comparing these examples help us reveal the logic behind these explanations and arguments in addition to the facts. In the present context, it may seem that modern societies are more advanced and therefore are less vulnerable to collapse compared to ancient ones, however there is no fundamental reason to believe this presumption to be true. Thus, studying and reflecting on historic examples may provide us with useful insights into what not to do today to avoid crises in the future.

### 1.1.2 Existential Risks

Throughout history, societies have been at risk of extinction due to catastrophic events, but it was not until people, weapons and goods could travel across the world easily that existential risks to the whole of humanity became much more likely. Climate change and pandemics are examples of worldwide issues that threaten our global resilience. Global hazards such as a pandemic directly threaten our existence, but climate change is indirect: it intensifies or propels the occurrence of other existential risks such as food shortages or water scarcity. Scholars are able to pinpoint specific factors of catastrophes, crises, threats, disasters, or emergencies that have led to collapse, especially when two or more factors converge onto society. Existential risks are those catastrophes or crises that have yet to materialize but are nonetheless worth studying because of their potential long term and short-term impact on the future of a society. The sheer scale of the future at stake makes mitigating existential risks highly valuable to achieving more resiliency in society. Having said that, not all existential risks are equal in severity and scope. Some risks could either wipe off a substantial portion of the population or just a small one, while others could lie somewhere between these two extremes. While Figure 1.2 is useful

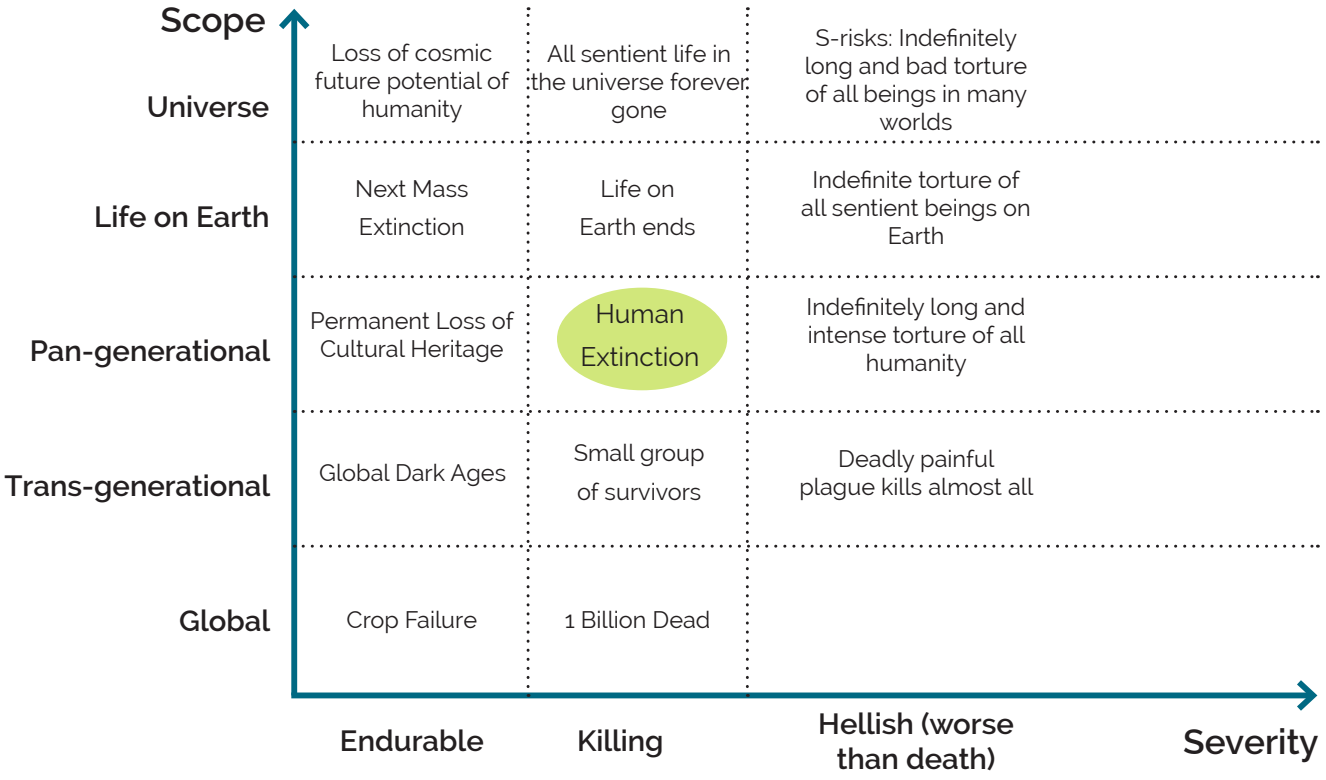



*Figure 1.2 Different scales of risks*

for understanding different scales of risks (Turchin and Deckenberger, 2018), for the purposes of our research we would consider most if not all of the examples on Figure 1.2 as existential risks.

Historically, authors have used threats and risks interchangeably in many contexts. It is important to note that we do not refer to risks as threats. We define risk as the potential loss of life, injury, or destroyed or damaged assets which could occur to a system, society or a community in a specific period, determined probabilistically as a function of hazard, exposure, and vulnerability (*National disaster risk assessment*, 2017). This implies that the presence of vulnerabilities within a system gives rise to risks, and the system's capacity to manage and withstand these vulnerabilities over a period is what determines the magnitude of the risks as well as a society's level of resilience. Factors that affect the magnitude of a risk are considered threats.

To deepen our understanding of how the Canadian system might be vulnerable to existential risks, we ask this secondary question to guide our research efforts: How might we better understand existential risks (such as climate change, pandemics, disease, geopolitical instability, war, terrorism, genocide, famine, poverty, bioweapons, AI etc.) to achieve more resiliency for future Canadian society?

### 1.1.3 Resilience

Resilience is a term whose interpretation largely depends on the context in which it is being used and that has quite different meanings in different fields. A generic definition of the term could be characterized as "the ability to thrive in the face of adversity," (Gaffigan, 2022). From a systems perspective it is the ability to adapt to changing circumstances, dynamics, or influences that force a system to find a new equilibrium. Public Safety Canada describes resilience as "the capacity of a system, community or society to adapt to disturbances resulting from hazards by persevering, recuperating or changing to reach and maintain an acceptable level of functioning" (*An Emergency Management Framework for Canada*, 2017). Another definition of resilience comes from the academic research group Resilience Design Lab: the ability of a system experiencing a destabilizing event to return to a stable condition within reasonable time (N. Harfoush, personal communication, April 8, 2023), which is the definition that best suits our purposes. These definitions all have similar components but have a specific meaning depending on their context.

By breaking down these definitions, we can identify four main components. First, there are the "characteristics" of resilience, typically described as the ability to adapt, thrive, overcome, persist, or continue to function. Second, there is the "system" to which we are attributing the characteristics of resilience. This is the piece that is most context specific; it could be an IT ecosystem, a natural ecosystem, an individual, a community, a free market, an entire economy, or a country or nation. Third, there is also the "conflict," which is typically referred to as hardship, changing circumstances, crisis, or adversity. Lastly, there is also an implied journey, through which our "system" travels into the conflict and emerges on the other side, now as a "resilient system," having survived its perilous journey.

In the context of our research, the "system" is the country of Canada and all its peoples, the "conflict" is a crisis resulting from an existential risk that has the potential to cause societal collapse, and the journey is set in the future (i.e. it hasn't occurred yet). Put simply, we are interested in increasing Canada's resilience by understand the factors that affect resilience and the threats, risks, or crises on the horizon.

The journey to a more resilient future looks different for different people. Our individual behaviours, values and dreams mean we all hold different visions of an idealized future. Canada is at a time of reckoning with its ugly past and mishandling of Indigenous relations. Globally, the nations of the world are reckoning with

planetary limits to natural resources, although some nations are struggling more than others. These issues are not unrelated, as Wright explains how we've gotten to where we are by colonization and over-borrowing on planetary resources: "The Australian biologist Tim Flannery has called human beings the 'future-eaters.' […] We have financed this colossal debt by colonizing both past and future, drawing energy, chemical fertilizer, and pesticides from the planet's fossil carbon, and throwing consequences on to coming generations of our species and all others" (2019). Ultimately, resilience to existential risks means safeguarding future generations, and that includes clearing the "colossal debt" those future generations would otherwise inherit. Clearing the "colossal debt" also requires a decolonization of the future, as our past and present actions of colonizing natural resources and Indigenous peoples have consequences for future generations. At its core, decolonization means questioning the dominant colonial systems that caused these debts in the first place (Thurston, n.d.).

### 1.1.4 Alternative Worldviews and Perspectives

As part of our research, we wanted to recognize and honour a plurality of perspectives and worldviews, especially those different from our own. To get a better understanding of where we, the authors and researchers of this work, come from and our positionality, please refer to the Personal Acknowledgement section. The underpinning of our research is that the dominant Western (colonial) view has led to the degradation of the environment and perpetuated the devaluation of Indigenous knowledge. Therefore, our hypothesis is that by considering alternate perspectives and worldviews, including Indigenous worldviews, we could help shed light on how to create a more resilient Canadian society.

First, let us unpack what we might consider some worldviews to be. The Center for Global Awareness, an educational nonprofit, introduces five main worldviews: Indigenous, Traditional (political conservatives, populist right, alt right, and religious fundamentalists), Progressive (liberal/progressive left), Globalized, and Transformative (Aimes, n.d.). We've adapted this framework to reflect the four main worldviews we encountered in our primary research:

Collaborative and Global Worldview

Transformative and Progressive Worldview

Moderate and Pragmatic Worldview

Modern Indigenous Worldview

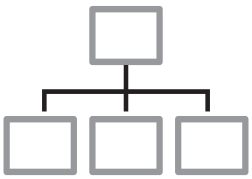
Part of our rationale for examining Indigenous worldviews was expressed by Indigenous author Margaret Kovach, "Many non-Indigenous young people are attracted to Indigenous approaches as well because, I believe, it has to do with a generation seeking ways to understand the world without harming it." (2010). Kovach also outlines two challenges of research involving Indigenous people: first, "finding (and using) a research approach that is not extractive and is accountable to Indigenous community standards on research so as to honour the tribal worldview." Our research aspiration is to be inclusive of Indigenous worldviews, as a modest act of indigenization, to show that a plurality of perspectives is needed to create resilient futures. Second, "There is a fundamental epistemological difference

between Western and Indigenous thought, and this difference causes philosophical, ideological, and methodological conflicts for Indigenous researchers [...] it feels as though the space is uninviting. This sense of exclusion has a direct impact on Indigenous scholars and students within academia" (Kovach, 2010). Our intention to seek out Indigenous perspectives wasn't encouraged by everyone we spoke to, and rightfully so. There is a huge fear in academia of non-Indigenous scholars repeating the same extractive harms on Indigenous peoples. Our inquiry was driven by a desire to respectfully and responsibly understand Indigenous worldviews, to be allies in bringing these alternate perspectives into academic discourse. Especially as non-Indigenous scholars ourselves, we want to act as allies by amplifying Indigenous voices in academic discourse. We believe a first step toward reconciliation should be to try to understand other's perspectives, especially ones not congruent with your own and we hope that our work, this work, makes bringing Indigenous perspectives and worldviews into academic discourse easier for the scholars that follow us.

We want to acknowledge the risks towards being extractive, as well as "the risks of bringing cultural knowledges into Western research spaces [...] the misinterpretations, appropriations, and dismissals that often accompany Indigenous ways of knowing within the academy. The transformative potential for academia in welcoming diverse knowledges is significant, but at what cost to Indigenous peoples?" (Kovach, 2010). Many researchers, like ourselves, are keen to seek out Indigenous participation and we want to acknowledge the engagement and involvement fatigue as a very real cost to Indigenous peoples, which we discuss further in Section 2.3 Limitations. We weighed these risks, mitigated them as best we could, and still we felt the importance of bringing more Indigenous perspectives into academia and their significance to our field of study outweighed the risks. More importantly our intuition told us we had to try because we felt it was the right thing to do.

# 2.0

# Methodology



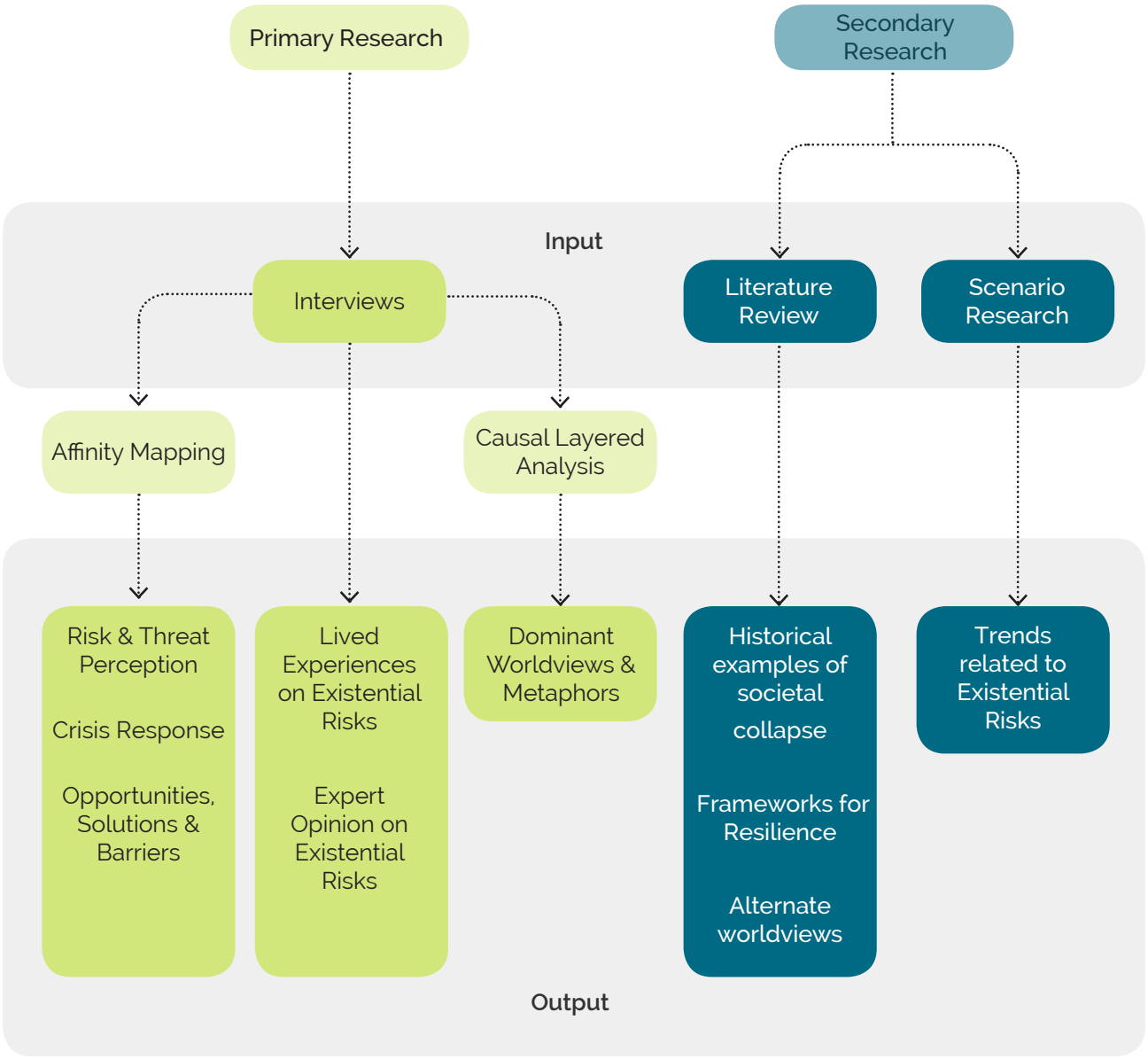



*Figure 2.1 Research process diagram*

## 2.1 Primary Research

### 2.1.1 Interviews

For our research study, we focused on designing and conducting semi-structured interviews to explore how learning from alternate worldviews and systems can help build more resiliency in the current Canadian system. Through conducting these interviews, we sought to explore individuals' perception towards existential risks, their possible approach towards crisis response, and finding new opportunities and challenges in the current system to inform our framework for resilience. Storytelling and qualitative inquiry were the primary methods of information gathering during these interviews.

In the previous chapter (in Section 1.2.4 Alternate Worldviews and Perspectives), we emphasized how diversity and inclusion are imperative to our research study. To examine existential risks and how resilience and affiliated approaches are currently perceived in society, we wanted to invite individuals from different backgrounds, including diverse Indigenous perspectives, who have a myriad of lived experiences.

We aimed to invite two distinct sets of participants:

**Individuals** who have diverse backgrounds, experiences, and worldviews: newcomers, long-term residents, people who live in urban areas, people from rural settings, and people who have lived and travelled abroad to understand their lived experiences. We found these participants through professional, academic, and social networks and sent them a screening questionnaire through which demographic information was collected to better understand their background. We were able to engage with one Indigenous participant who offered fruitful insights into our subject matter.

**Experts** who have experience related to existential risks to gather their perspectives on existential risks in the current Canadian system. Experts were identified and selected based on their experience: professionals from the emergency management

field, academics who have published work on existential risks, people who work in emergent and/or high-risk fields, professionals from the security and defense fields.

The purpose of inviting experts was to compare the collected data on individuals' lived experience with experts' understanding of existential risks to identify potential differences in terms of their threat and risk perception, crisis response, and future risk response.

### 2.1.2 Affinity Mapping & Thematic Analysis

To analyze the information gathered from interviews, we used **affinity mapping** and **thematic analysis** to understand the major concerns and worldviews of participants with respect to existential risks. The affinity mapping process involved coding key comments from the interview transcripts and grouping similar information into thematic groups. The thematic groups arose organically out of the process, rather than starting with preconceived themes. We completed the analysis of expert interviews separately from the individual interviews so that the insights could be compared. We also separated the interview information into three sections—threat and risk perception, crisis response, and future risk response—and completed the affinity mapping and thematic analysis separately for each of the three sections. This allowed us to extract insights relevant specifically to those three domains.

### 2.1.3 Causal Layered Analysis

Following the insights gathered from the affinity mapping and thematic analysis exercises, we used the foresight method of Causal Layered Analysis (CLA) to discover dominant worldviews of the interview participants. Data gathered from the participants was categorized into the CLA layers (see Figure 2.2).

**Litany:** The topmost level captures observations, current events, and evidence that currently exist within the system.

**System and Structures:** This level demonstrates the fundamental structures, organizational frameworks, and recurring patterns in the system that facilitate the manifestation of the litany level into the current state of existence.

**Worldview and Values:** As we progress further down in the analysis, we explore the principles, values, and philosophical perspectives that over a period of time uphold the various systems and structures.

**Deep Myth or Metaphor:** The deepest stratum of analysis delves into the myths and metaphors that enable the system to persist in its current form.

Based on the data collected from the interviews, participants' responses largely corresponded to the first two levels of the CLA: litany and structures and systems. We employed the data obtained from these two levels to extract and scrutinize the third level of the CLA, the worldviews, values, and principles held by every individual involved. The CLA process was repeated to analyze each individual participants' worldviews and values. There were many patterns and similarities in those CLAs that we that were able to synthesize into four overarching CLAs

> *"Myth is an arrangement of the past, whether real or imagined, in patterns that reinforce culture's deepest values in aspirations [...] Myths are so fraught with meaning that we live and die by them. They are the maps by which cultures navigate through time" (Wright,2019).*

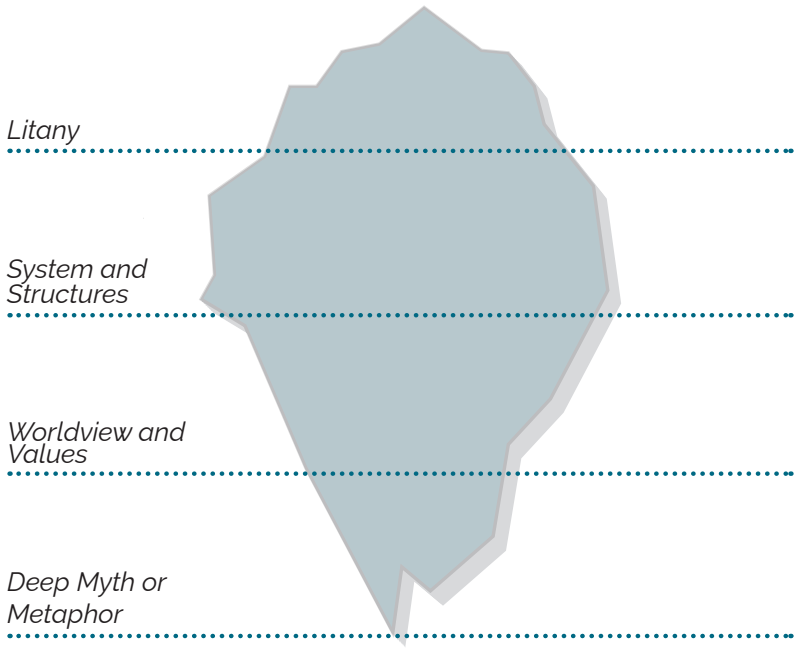



*Figure 2.2 Diagram of the Causal Layered Analysis (CLA) foresight method*

(see Figures 3.14 to 3.17) that represent the prevailing metaphors derived from our participants. It is important to note that these four CLAs are not comprehensive but rather representative of the participants' views shared in the context of this study.

**Causal Layered Analysis (CLA) –** the analytical foresight framework developed by Sohail Inayatullah, which consists of four layers: litany, structures and systems, worldviews and values, and deep myth or metaphor

**Affinity mapping –** The process of sorting and grouping information based on identified similarities (*What Is an Affinity Diagram?*, n.d.).

**Thematic analysis –** The process of identifying emergent themes from a data set (Maguire and Delahunt, 2017)

## 2.2 Secondary Research

### 2.2.1 Literature Reviews

Our literature review covers three main topics: historical examples of societal collapse, frameworks for resilience, and alternate worldviews. The books that cover historical examples of collapse gave us frameworks for understanding main causes or drivers of collapse. We reviewed several texts on societal resilience and found discussions of resilience pertaining to the present-day Canadian context to be lacking. One of the influential books we reviewed was *Upheaval* by Jared Diamond (2019), which is a comparative study of six modern nations and the factors that helped or hindered their ability to overcome a crisis. In essence, it is an evaluation of these nations' resilience. The resilience framework from this book formed the basis for our evaluation of Canada's resilience in Section 3.3.2. We also review other frameworks of resilience and their application to a Canadian context. We also read texts on decolonizing theories, worldviews, and Indigenous perspectives to gauge how various alternate systemic models might help us to obtain a new perspective on our identified problem area. Lessons from our literature reviews inform our final recommendations in Section 4.

### 2.2.2 Scenario Research

To further aid our global understanding of existential risks, as well as how both private and public institutions around the world have responded to these risks, we reviewed and analyzed various scenario generating methods employed by these organizations that helped inform their framework of resilience. We carried out the scenario research method in three major steps:

**1. Scanning Suitable Scenarios:** Initially, we focused on selecting suitable scenario reports that were generated by public organizations such as World Economic Forum (WEF) and the Intergovernmental Panel on Climate Change (IPCC) that have a global understanding of existential risks. Amidst this process, we found reports produced by private organizations that added a new perspective. These private organizations had a different approach to generating future scenarios that tended to be narrower in scope and reflected the organizations' values and worldviews. We found it insightful

to observe and compare these frameworks to examine how different organizations' diverse teams and individuals as well as their beliefs, principles, and values, influence each organization's responses to different risks. We aimed at gathering scenarios positioned around the essential resources for living—water, energy and food.

**2. Evaluation of Frameworks:** We examined how the organizations implemented tools, such as the 2x2 Matrix and variations of this foresight scenario development tool, to develop their future scenarios. The process of evaluation focused on collecting information on the following factors:

- Framing question (timescale)
- Scenario development method (critical uncertainties)
- Mapping key drivers of change (signals, trends)

In many cases, we found it important to analyze and learn from the approach that was considered while building the scenarios. Certain approaches taken by organizations are often driven by their long-term and short-term decision-making planning and processes. Evaluating these different frameworks helped us obtain insights into key drivers, signals, and trends that exist within the current global system.

**3. What do these trends mean for Canada?** It is important to note that these reports provided extensive research on a global scale. Therefore, distilling key information relevant to our research study was vital. We focused the gathered information that spoke to the key areas of inquiry of our research, and we extrapolated what their implications could be for a Canadian context.

## 2.3 Limitations

### Indigenous Involvement

Canada is home to over 600 Indigenous communities representing over 50 distinct nations. Our goal was to include multiple Indigenous voices and perspectives from different cultures as well as an expert who identified as Indigenous. With growing interest in involving Indigenous peoples in research projects, engagement and involvement fatigue for Indigenous people can be a consequence that researchers should be aware of. We are grateful to those who were generous with their time, but we also recognize that we had to supplement our understanding of Indigenous views with secondary sources and that is a limitation to the depth of our study on including and amplifying Indigenous perspectives.

### Global Existential Risks

Many existential risks have global implications, such as our ability to moderate climate change as a driver of existential risks; globally shared resources such as fish, clean water and unpolluted air; geopolitical conflicts between multiple nations and the impacts of war; and nuclear threats and the global implications of a nuclear winter to name a few. This study is limited to the impacts of existential risks on Canadian society and Canada's ability to become more resilient, however we recognize that many of the themes we explore have broader implications for humanity as a whole and cannot be tackled by the efforts of one or even a few countries.

# 3.0

# Data Collection and Analysis

# 3.1 Primary Research

## 3.1.1 Data from Interviews

**Lived Experience:** One respondent identified as a woman, six as men, and two as non-binary or non-conforming. Three identified as having entry-level positions at work and six identified as mid-level, none as senior level. Four identified as North American, two as Asian, two as South American, and one as Indigenous. Six participants are longtime residents of Canada, and three have moved here within the last three years. (See Figures 3.1-3.4.)

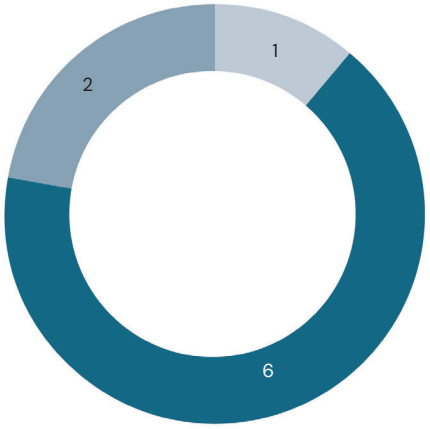



*Figure 3.1 Gender*

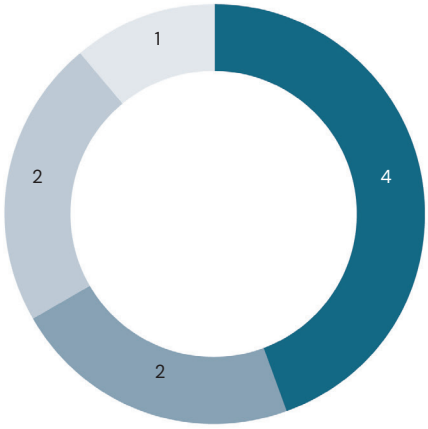



*Figure 3.2 Cultural background*

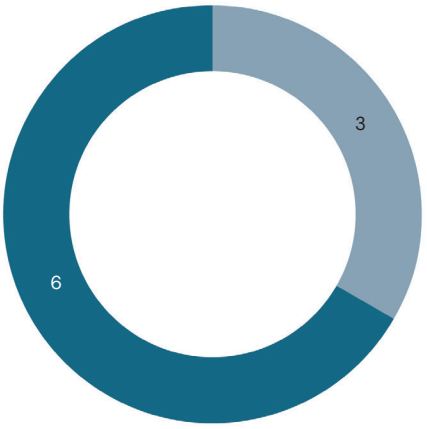



*Figure 3.3 Work experience*

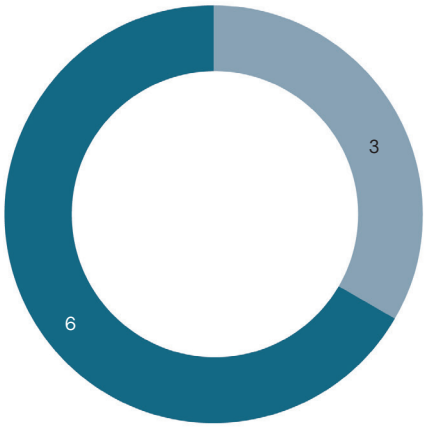



*Figure 3.4 Time lived in Canada*

**Experts:** We were less concerned with selecting for diversity because we were looking for people with experience with existential risks and resilience. Half the experts were men, half women. Two were security and defence experts, two were emergency management and disaster response experts. Three were involved in government action and response to the COVID-19 pandemic, either directly or as a consultant. (See Figures 3.5 and 3.6.)

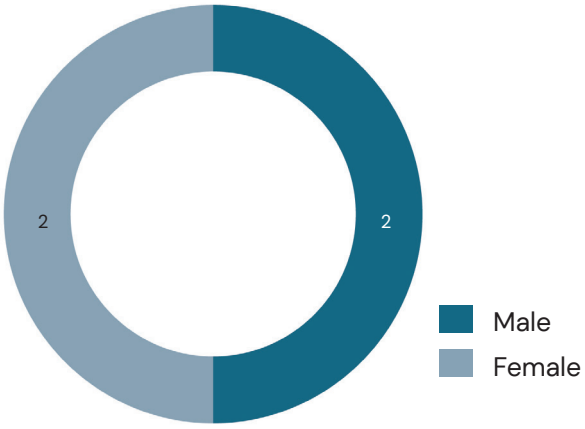



*Figure 3.5 Gender*

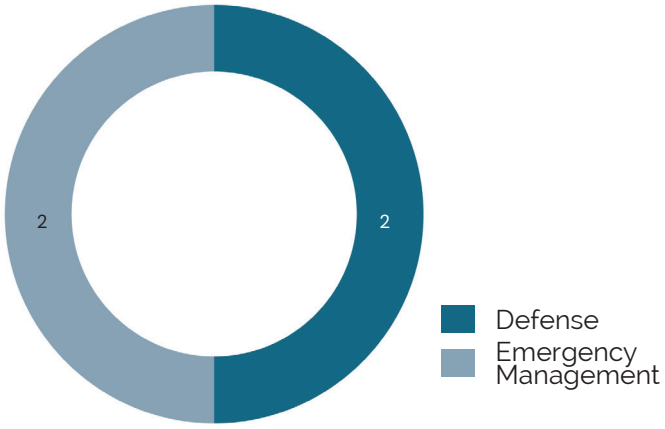



*Figure 3.6 Expertise*

As presented previously in Section 1.2.4, we have categorized and characterized four main worldviews represented in our interviews in Table 1:

| **Worldviews** | **Characterized by:** |
|---|---|
| Collaborative & Global Worldview | Global interdependency, Need for collaboration, and Conflict mitigation |
| Transformative & Progressive Worldview | Call for a fundamental change or new worldview |
| Moderate & Pragmatic Worldview | Honest appraisal of the current reality without emphasizing interdependency or collaboration, or calling for a fundamental change or new worldview |
| Modern Indigenous Worldview | Indigenous values situated in a modern context |

*Table 1 Characterization of the four dominant worldviews*

These worldviews are contextual and not absolute: they represent worldviews of participants to the extent that we were able to glean in a one-hour conversation regarding specific topics of threat and risk perception, crisis experience, and future risk response, and are not necessarily representative of participants' holistic worldviews. The significance of these worldviews is discussed in more detail at the end of this section.

Some participants fell into one worldview category almost exclusively, whereas others were more balanced between multiple worldviews, and some were split between two. Experts tended to be split or have more balanced worldview profiles, as the nature of their work often requires them to understand the perspectives of many stakeholders. See Figure 3.13 for a breakdown of worldviews represented by our participants.

## 3.1.2 Insights and Findings

### Insights from Lived Experiences – Threat & Risk Perception

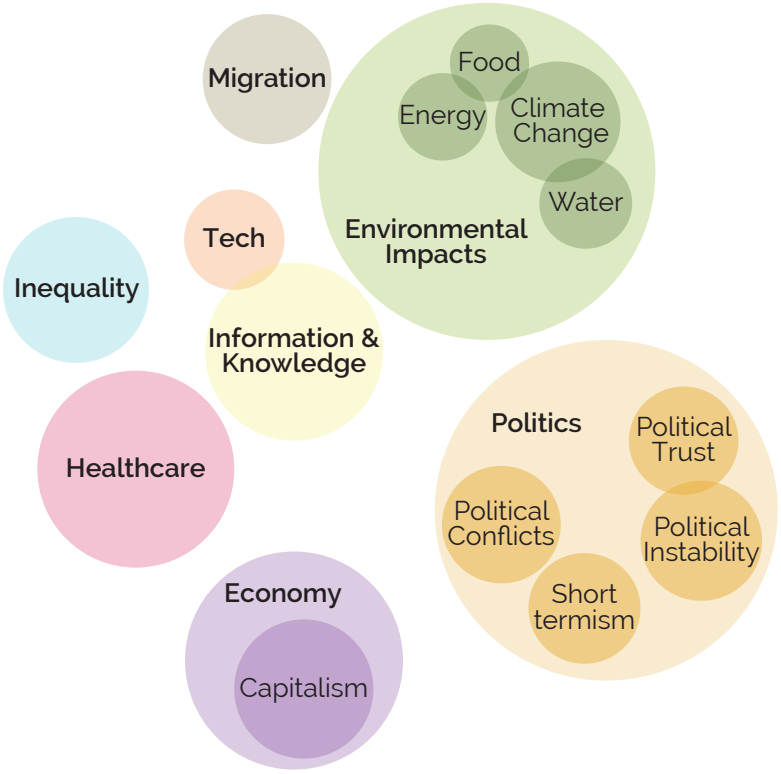



*Figure 3.7 Threat & risk perception from lived experiences*

**Environment:** One of the primary themes identified from individuals' risk perceptions was that of environmental impacts. From the data gathered, it was evident that climate change is a significant catalyst leading to numerous existential risks, ultimately resulting in detrimental effects on ecosystems. Many participants highlighted worldwide water scarcity as a growing concern resulting from climate change. Participants spoke about extreme polarized weather conditions such as droughts that could lead to more forest fires and heavy rainfalls causing mudslides as serious potential threats in the future for Canada. Other concerns mentioned by participants include food insecurity from adverse effects of climate change on food systems in Canada and globally, which is exacerbated by poverty and potentially

leading to starvation.

**Politics:** This was the second largest theme of all. Threats such as political conflicts giving rise to wars and growing political instability between governments and their citizens could lead to mass political reforms and also affect the trust between the government and citizens. Invasion by foreign powers such as the U.S. and Russia due to the potential deterioration of relations remains one of the greatest perceived threats to Canada. Government short-termism and political polarization came up multiple times during the interviews.

**Economy:** Participants emphasized thriving capitalism as the driving factor for potential destabilization of the Canadian economy (from resource overextraction, environmental degradation, and money influencing politics).

**Healthcare:** Several participants signaled future existential risks rising in the healthcare sector. Participants shared personal experiences during the COVID-19 pandemic that shed some light on the decreasing availability and accessibility of healthcare in Canada. The Indigenous participant highlighted the growing distrust between Indigenous people and healthcare providers in the context of healthcare facilities in remote Indigenous communities.

**Technology & Information:** With the rapid increase of social media culture, participants spoke about how social media platforms were used to provide misinformation during the COVID-19 pandemic that worsened the crisis. The Indigenous participant shared that advancements in technology are slow to reach Indigenous communities (e.g. reliable and fast internet access).

**Inequality:** The Indigenous participant shared how Indigenous communities feel very on their own because they exist outside of typical Canadian systems (e.g. many Indigenous people do not vote because they do not feel represented by the Government of Canada) and expressed the feeling of being left behind compared to rest of the country. Other participants raised concerns around racism, transphobia, and mental health as major concerns.

## Insights from Lived Experiences – Crisis Response

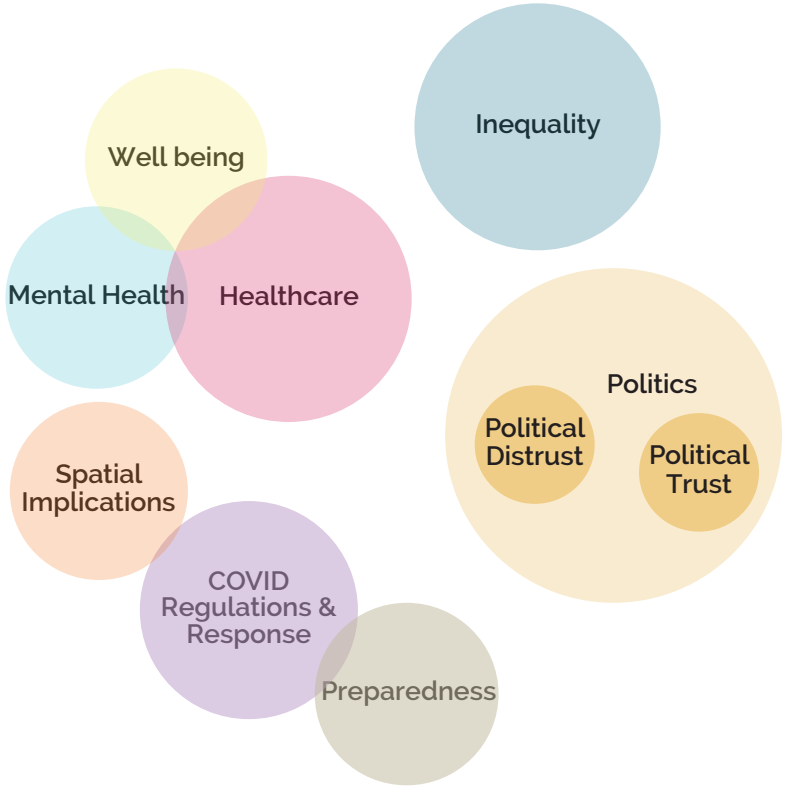



*Figure 3.8 Crisis response from lived experiences*

While discussing lived experiences during the COVID-19 pandemic, participants emphasized the adverse impacts on their mental health and wellbeing and how the extent of this impact is not yet known. Participants spoke about how vulnerable and disempowered populations were impacted the most. Although they expressed trust in the government, one respondent ultimately felt they had more trust in their own self-reliance, whereas the Indigenous participant who did not trust the government spoke about their community having to support itself. These concepts are explored further in the literature review (self-reliance as a manifestation of the "Self-made Man" concept in Section 3.2.1, and Indigenous community values as an Indigenous precept in Section 3.2.4).

Many participants spoke about lack of preparedness at individual, systems, and

government levels that exacerbated effects of the COVID-19 pandemic. Participants spoke about relying on themselves and their families for support rather than from the government, which eroded their trust in the government.

## Insights from Lived Experiences – Future Risk Response

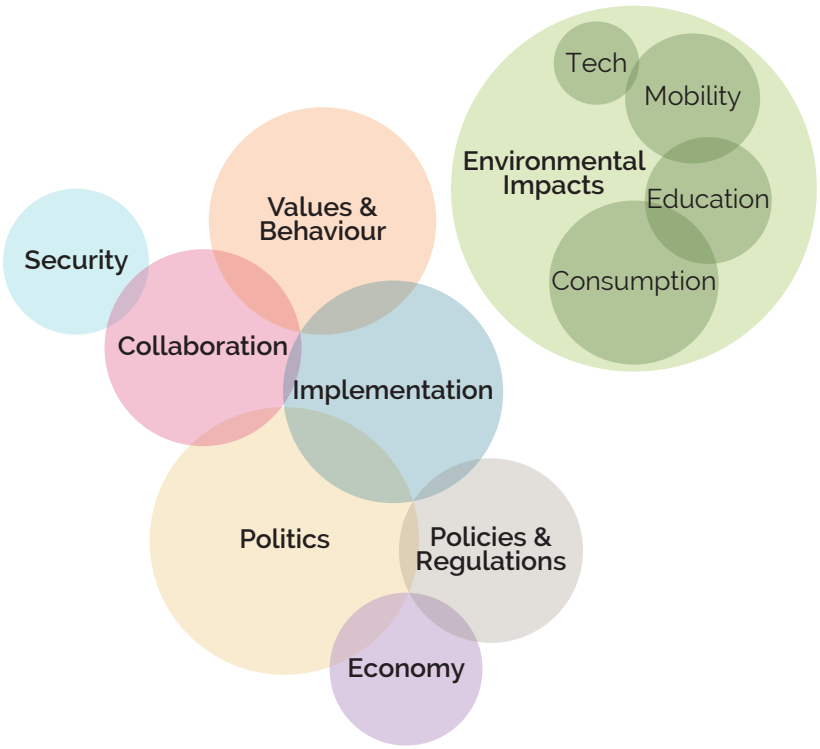



*Figure 3.9 Future risk response from lived experiences*

**Barriers:** Implementation of policies and regulations was identified as the biggest barrier. Many participants spoke of short termism in the current political system, i.e. competing agendas of re-election versus impactful response to future risks.

**Opportunity:** Collaboration was the most mentioned opportunity for addressing existential risks in the Canadian system, i.e. the need for diversity, empathy, strong communities, interdisciplinary approaches, connective spaces, and equity. This was

supported by the suggestion to recreate ties between government bodies and communities to address future challenges.

**Solution:** Some participants felt that the government is not providing adequate regulatory oversight in many areas to curb environmental degradation caused by corporations as the government is not holding them accountable. As well, participants felt that decision-making and policy-building processes need to involve citizens' voice to better prepare for the future.

## Insights from Experts – Threat & Risk Perception

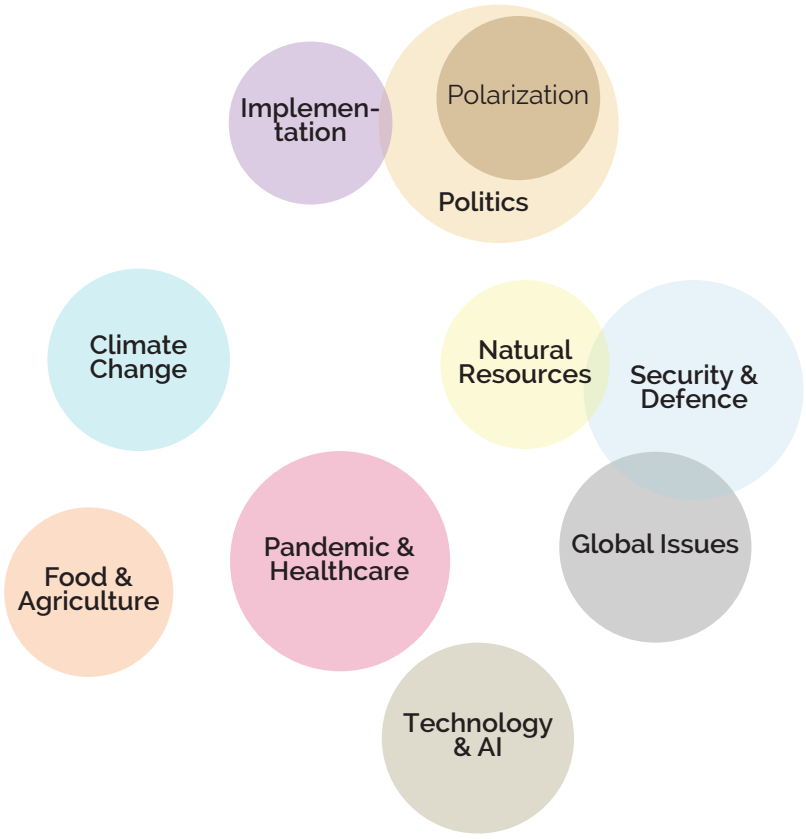



*Figure 3.10 Threat & risk perception from experts*

**Security and Defense:** Several experts highlighted global issues arising from bad governance that could lead to potential existential risks such as nuclear wars or other international conflict in the near future. A few experts elaborated on how global wars affect other factors such as population, supply chains, energy resources and fuel.

**Climate Change:** Experts' opinions aligned on climate change being a leading driver of system change, as the cause of mass migration and sea level rise for example. Other themes related to climate change stressed the decline of natural resources that are affecting food systems and limiting access to drinking water.

**Politics:** Experts surfaced their concerns regarding the government's inability to conduct lateral coordination and its focus on short-termism. Experts expressed how polarization in society leads to increasing violence and could be a threat to society in the future.

**Healthcare:** Experts emphasized how existing systemic barriers are affecting the healthcare system. They stressed how the unpreparedness of the government during the COVID-19 pandemic hampered individuals' faith in politics and the government system.

## Insights from Experts – Crisis Experience

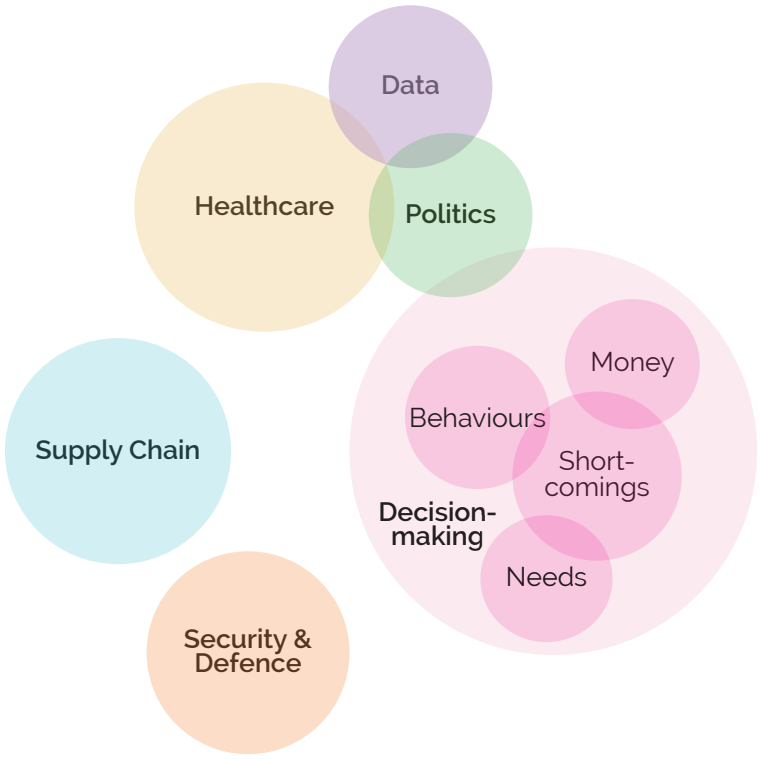



*Figure 3.11 Crisis response from experts*

It was interesting to observe and gather inputs around decision-making processes and procedure even though our interview guideline did not particularly have these questions in place. Experts' observations around decision-making processes during the COVID-19 pandemic highlighted how individuals with no expertise in emergency management and pandemics were involved in the process. The government failed to focus on long-term recovery and resilience while building preventative measures to overcome the crisis.

Long-term consequences of decisions made during the COVID-19 pandemic were poorly assessed and understood. Experts spoke about the government's lack of proactive measures and shortages of medical equipment and supplies.

Experts highlighted the need for a concrete plan to protect infrastructure (related to food, energy and water) during the COVID-19 pandemic. The government was forced to take a social lens to address the crisis which highlighted the difficulty of reconciling societal and corporate needs. Many decisions were dictated by corporate values and driven by money. For example, the lack of preparedness for the COVID-19 pandemic can be attributed to political will of not wanting to spend money just in case of an emergency.

Other major themes that arose from the interviews were politics, data, and healthcare. Participants spoke about how information shared with people during the COVID-19 pandemic was heavily influenced by politics. Politics played a significant role in creating awareness during the recent pandemic as opinions from health experts were often competing with inaccurate information. Experts also expressed a loss of faith in politics, a theme consistent with that of the lived-experience participants who shared similar concerns.

## Insights from Experts – Future Risk Response

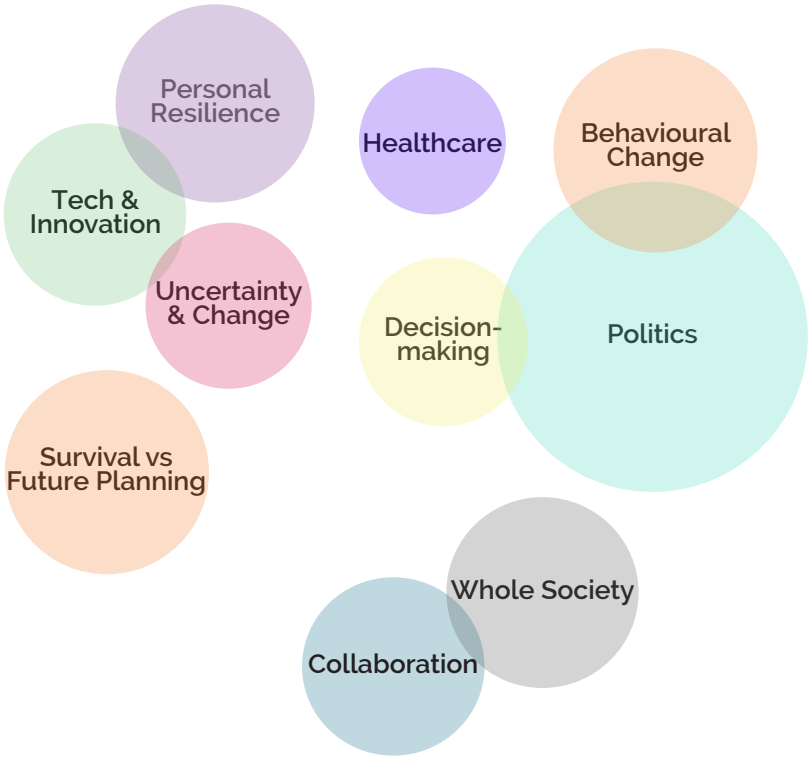



*Figure 3.12 Future risk response from experts*

**Opportunity:** Multiple experts emphasized a need for a holistic approach that involves collaboration between many stakeholders as their primary recommendation. Experts spoke about different scales of stakeholders (local, global) as well as different ages (children, seniors, and transgenerational threats). In terms of collaboration, experts spoke about how we are beginning to accept Indigenous and other ways of knowing, how we are beginning to incorporate sustainability, and how we need a healthy dose of humility to accept how much we must rely on one another. Experts used the United Nations (UN) as a great example of an organization committed to global cooperation, but regional instability and conflict (which the UN is ineffective at managing) remain as difficult barriers to overcome.

**Whole Society Approach:** Experts spoke about Universal Basic Income, making knowledge of existential risks accessible and relatable to individual members of the public, and the involvement of local networks, communities and resources as ways to incorporate a whole of society approach.

**Barriers:** Experts talked about Canada as a tenuous and fragile society: how our thinking and approach to risks is siloed, lack of trust of some societal groups as a barrier to diversity and collaboration, and Canadians' own inability to see our flaws and the corruption in our systems.

**Technology and Innovation:** Technology and innovation were another large theme, specifically how technology could do more to support emergency management, building resilience, and to overcome climate change. One expert believed that innovation driven by capitalism will push us to a **post-carbon economy**. Most experts (and participants) spoke about how technology and innovation would be part of a solution to existential concerns, but that there is often too much of an assumption that technology will save us. Experts also mentioned that more collaboration between technology sectors and emergency management needs to happen to make innovations more impactful.

**Energy transition/post-carbon economy** – Often referred to as the 'clean energy transition,' this term refers to "shifting energy production away from sources that release a lot of greenhouse gases, such as fossil fuels, to those that release little to no greenhouse gases" (Jawerth, 2020). Similarly, a post-carbon economy is one that relies on clean forms of energy such as nuclear power, hydro, wind and solar.

## Worldviews of Respondents

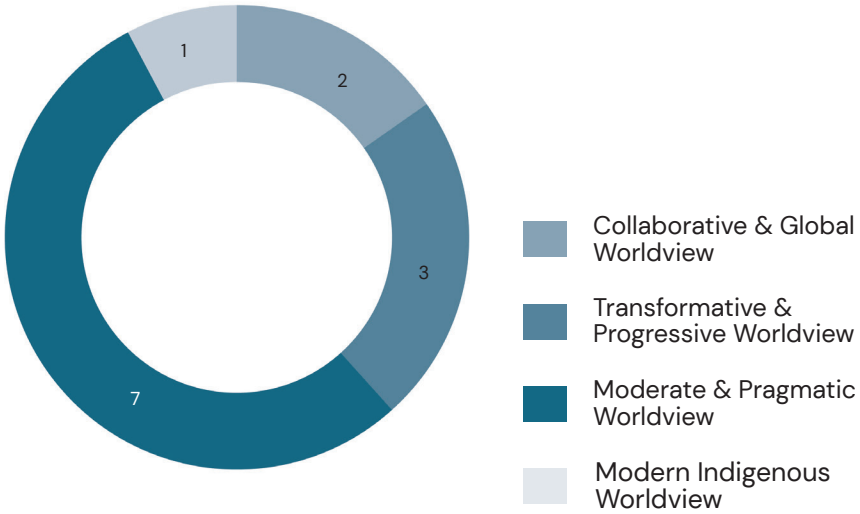



*Figure 3.13 Worldviews of respondents*

**Collaborative and Global Worldview:** We characterized two participants as having a dominant collaborative and global worldview, though aspects of this worldview showed up in five participants.

Responses from two participants (one expert and one non-expert) spoke about neoliberal values that are present in society today. Their views aligned on building more connections at a community level by involving the right stakeholders. They both stressed how there is a need for collaboration by creating more networks and linkages in the system to build resilience. The expert also believed that nature, technology, and innovation driven by climate change could address climate change and its consequences. One of the participants believed that social media, news channels, and other media outlets need to be scrutinized and controlled to avoid spreading inaccurate information. All these responses aligned with the ideologies of Collaborative and Global worldviews.

**Transformative and Progressive Worldview:** We characterized three participants as having a dominant transformative and progressive worldview, though aspects of this worldview showed up in nine participants.

We observed three participants who showed signs of being hopeful about future generations' abilities to address systemic issues. They emphasized how this could be achieved by pushing the government away from thinking about short-term actions towards long-term planning and the consequences this would have on different social classes. Attention was also drawn towards promoting more diversity in political systems to address existential risks. Two participants spoke about how the present political system needs to be abolished (massive political reform) to address severe challenges pertaining to existing corruption and rebuilding people's trust in the political system, however most of them believed that it is difficult to address climate change with the existence of other pressing issues.

**Moderate and Pragmatic Worldview:** We characterized seven participants as having a dominant moderate and pragmatic worldview, though aspects of this worldview showed up in responses of all participants.

Most experts and non-experts reflected ideologies of the modern and pragmatic worldview. Their responses highlighted how the government's lack of preparedness and short-term thinking during the COVID-19 pandemic have resulted in loss of faith in politics. They believed this could potentially lead to political polarization resulting in more violence in society. One of the respondents highlighted how the economy has suffered causing the weakening of pillars of governing systems and existing institutions which could be a serious threat to society.

**Modern Indigenous Worldview:** One participant was characterized as having a modern Indigenous worldview. Despite living in a large city, the Indigenous participant shared how they were affected by a lack of healthcare access during the COVID-19 pandemic because of their Indigenous identity. This issue extends to and is more severe for many Indigenous communities, especially if they are in a remote area. Lack of support from the government makes Indigenous communities feel very on their own. The participant shared how during the recent pandemic, Indigenous communities held townhalls to disseminate information about the pandemic in a way that made sense with their worldview. All these reasons account for part of the reason why Indigenous peoples' lack trust in the government today.

## Four Dominant Metaphors

From the primary research we have explored the litany, structures and systems, worldviews, and metaphors of the dominant themes that arose: Cultural Values, Environment, Political, and Indigenous perspective. These four metaphors provide the inspiration for our areas of opportunity (Section 4.1).

Cultural Values – All for one and one for all
Environment – Consumption equals happiness
Political – Lost faith in politics
Indigenous – Traditionalism is at odds with Westernization

## Cultural Values – All for one and one for all

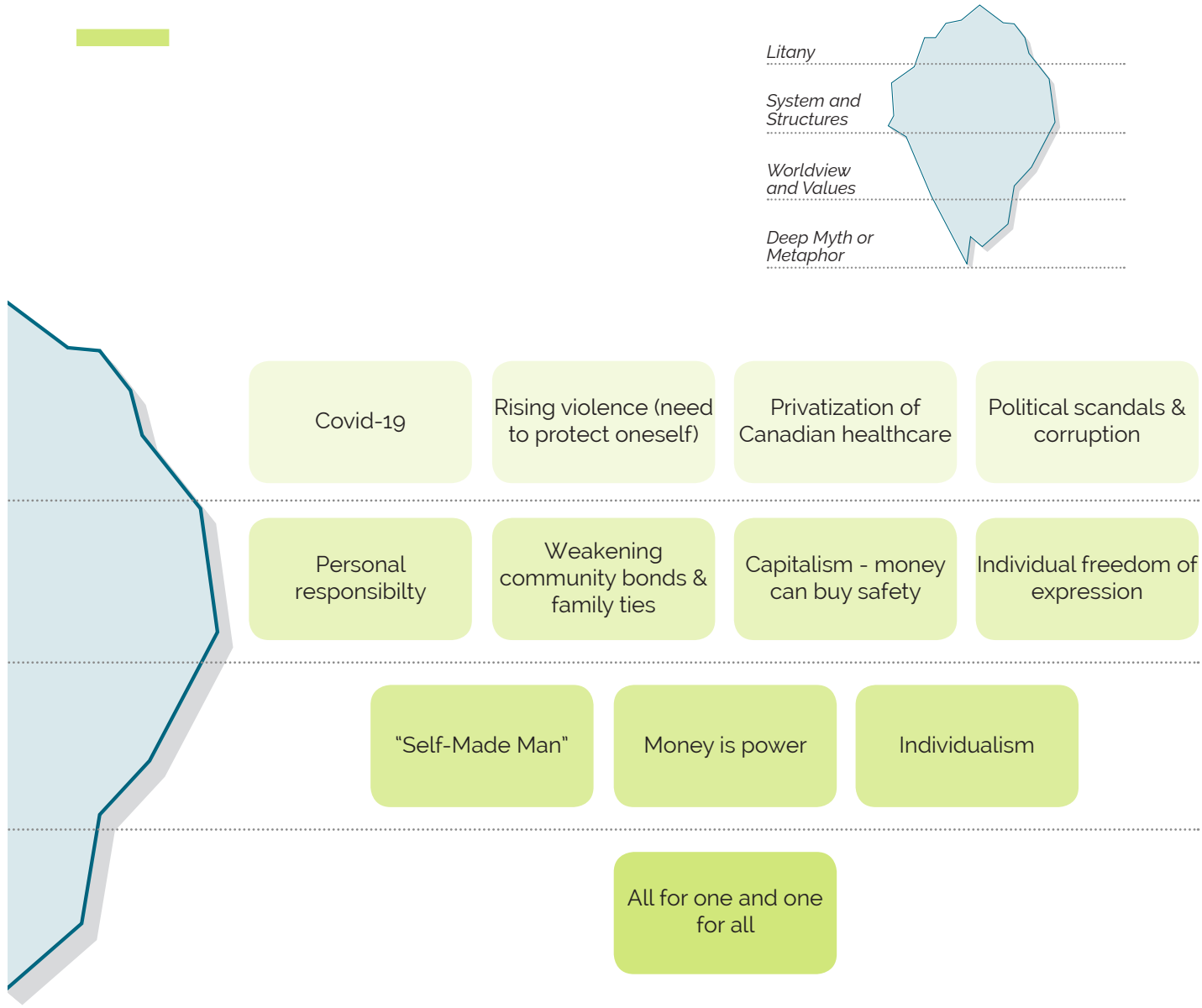



*Figure 3.14 Cultural values CLA – All for one and one for all*

## Environment – Consumption equals happiness

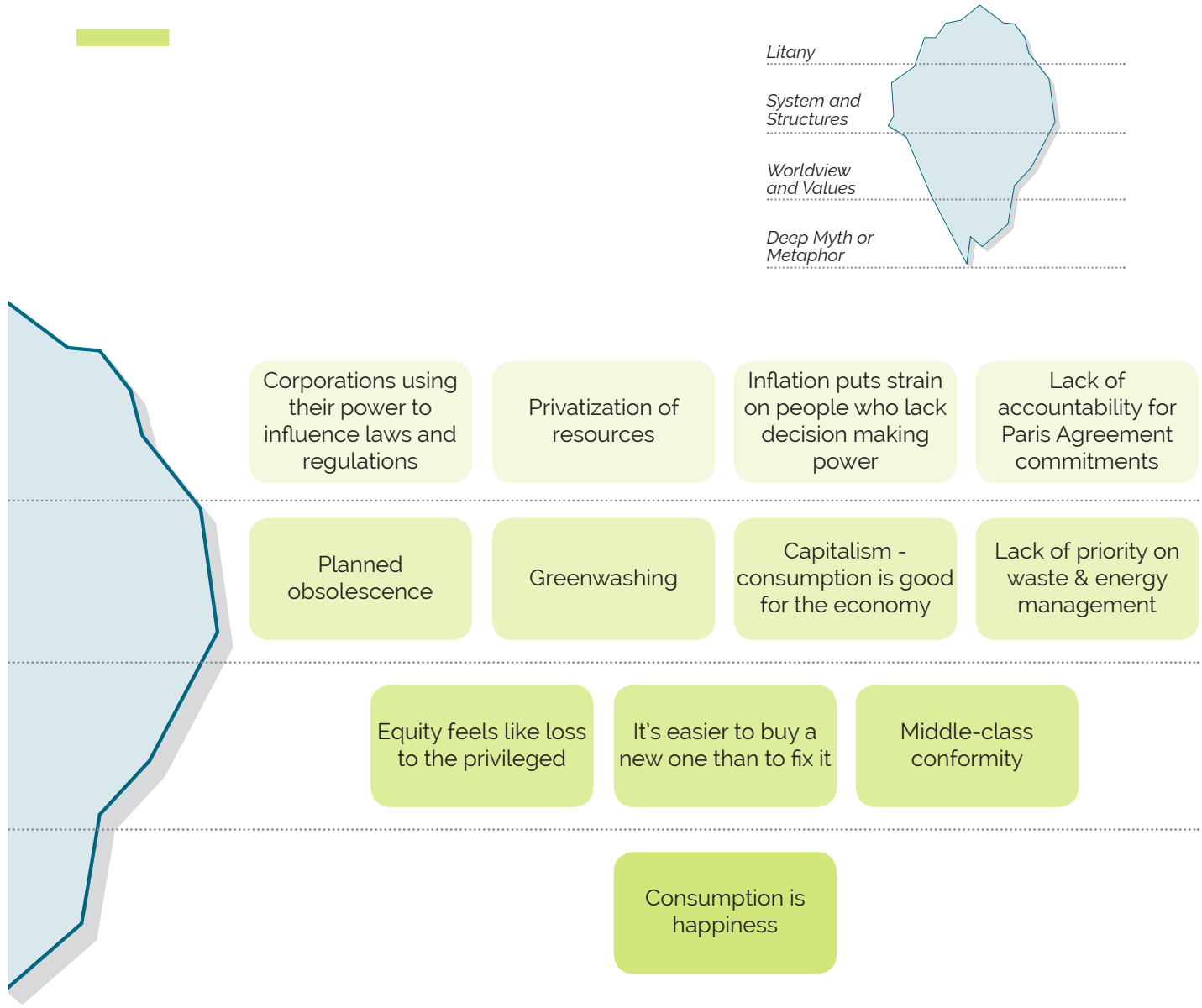



*Figure 3.15 Environment CLA – Consumption equals happiness*

## Political – Lost faith in politics

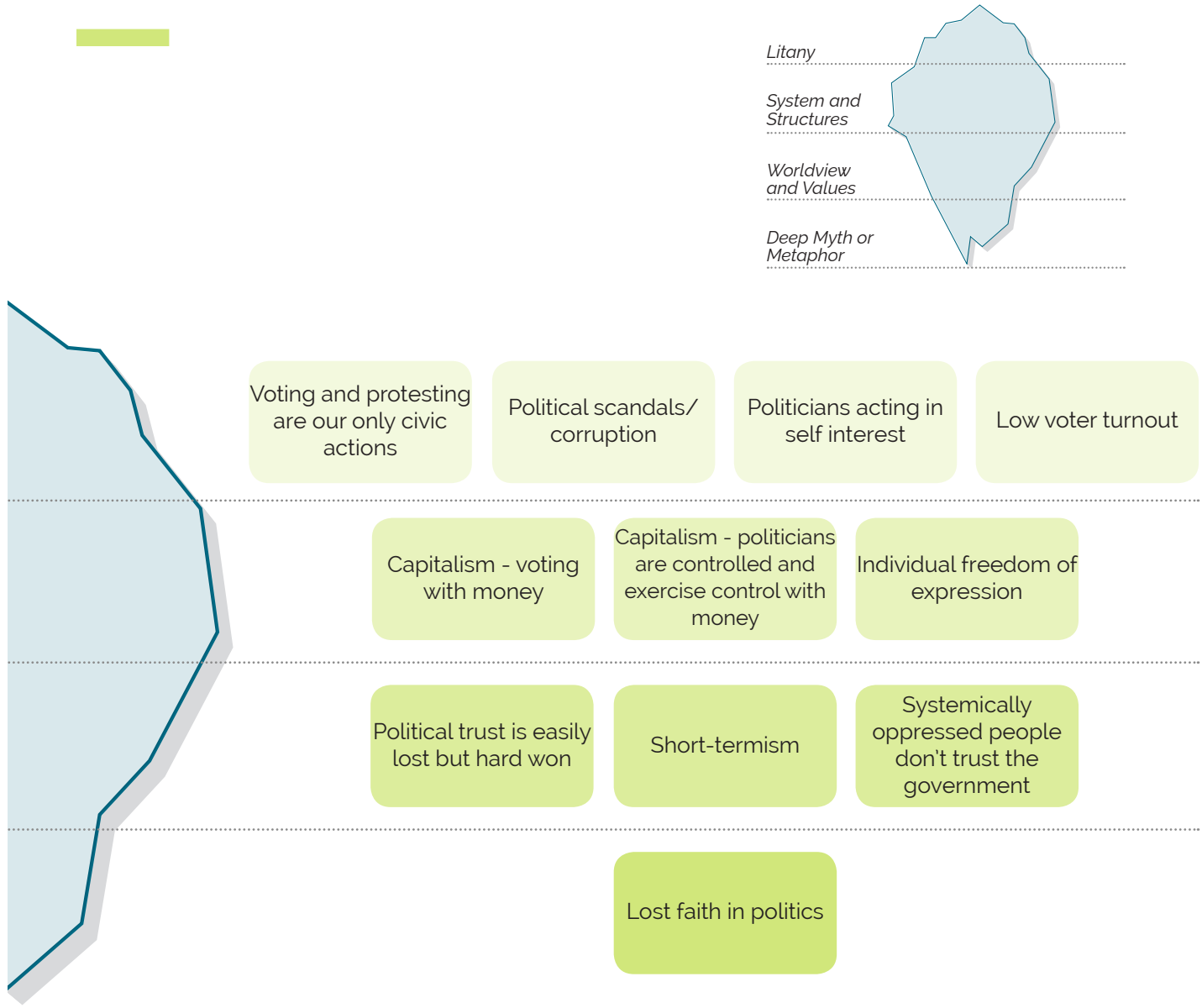



*Figure 3.16 Political CLA – Lost faith in politics*

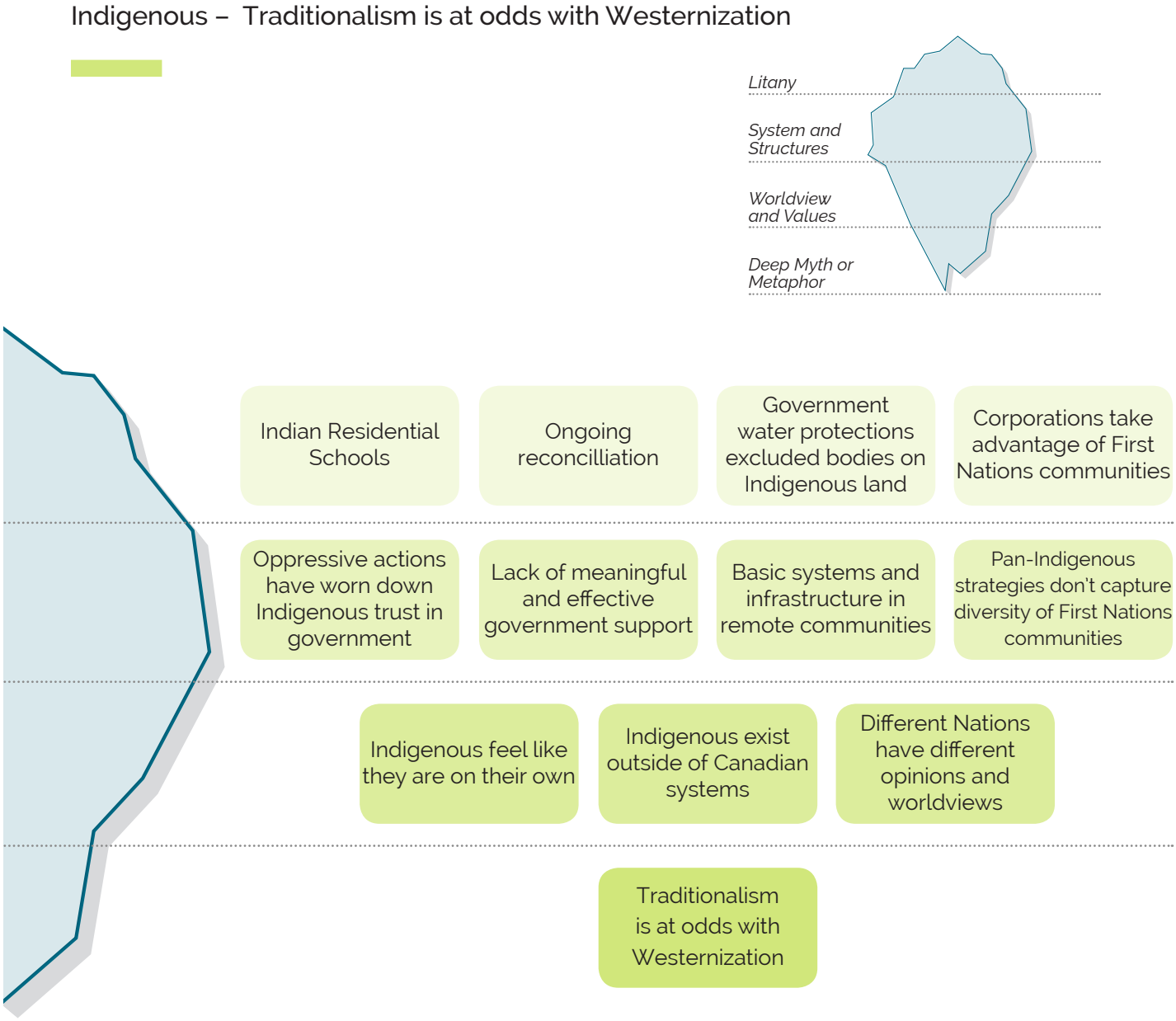



*Figure 3.17 Indigenous CLA – Traditionalism is at odds with Westernization*

# 3.2 Secondary Research

## 3.2.1 Historical Examples of Collapse

Many historical examples have helped in identifying the nature of societies that are indeed prone to collapse, revealing the underlying reasons for for the destabilization of these societies. Why do some societies collapse, and others recover? Are the dynamics of civilization inherently doomed to fail? Does the increasing complexity of societies ultimately always lead to collapse? By exploring questions of this nature, scholars who have dedicated their work to becoming experts in this field have come up with common patterns that are observable of societies that fail. For our research, we are interested in how historical examples of societal collapse might help us better understand generally the challenges that societies face to survive. To do so, we will analyze frameworks that authors have derived from historical collapses. Finally, we will evaluate those frameworks for their relevancy to contemporary Canadian society.

### Why do some societies collapse, and others recover?

The title of Jared Diamond's book is called *Collapse: How Societies Choose to Fail or Succeed* (2005) because although no society intentionally chooses to fail, members of groups within them often choose actions or make decisions that lead to that society's inevitable collapse. Some of these choices or actions would not typically be fatal, except that they were exacerbated by other less than ideal circumstances.

Poor group decision making is how societies inadvertently choose to fail. Diamond identifies four factors of failed decision making that often lead to societal collapse. Diamond's approach to analyzing societal collapse is perhaps overly reductionistic in nature: he deals with intertwined factors individually and separately, to understand complex processes. Diamond brings great clarity to these individual factors, but what ends up getting glossed over is the interconnectedness and interaction of these factors. Societal collapse is perhaps more complex than even Diamond presents

it. In all the examples in his book, and the example of the Greenland Norse which we analyze in depth, environmental degradation along with poor group decision making are always present when a society collapses. However, poor decision making negatively impacts all of the five key characteristics that affect societal-level collapse.

These five key characteristics that Diamond analyses when looking at a societal-level collapse are: human-caused environmental damage, natural climate change, increasingly hostile neighbours, decreasing support from friendly trade partners, and society's response to its environmental problems. The Norse initially flourished in Greenland because they arrived during a regional spell of mild weather in the natural cycle of climate change. All five factors outlined by Diamond played some part in the Norse's decline. The Norse depleted their environment by cutting trees, stripping turf, and overgrazing. Some 400 years after the Norse settled in Greenland the period known as the Little Ice Age began in the early 1400s, which affected one of their main sources of food by making grazing livestock very difficult. Trading with Norway declined as shipping lanes iced over and the bubonic plague ravaged Europe. Hostilities with a new wave of Inuit settlers further compounded the crises the Norse were facing.

Diamond concludes that complex societies often collapse because of degradation to environmental resources, which he attributes as the result of failed group decision making. The group dynamics of the Norse hindered them from learning crucial survival skills from the Inuit that may have prevented their collapse. Like the Inuit, other Indigenous North American hunter-gatherers had been attempting to settle in Greenland for thousands of years before the Norse arrived. While the Norse were settling Greenland, a new wave of Inuit people arrived. Those Inuit explorers brought with them cultural practices like seal fishing and other skills that transferred well between the similar environments of northern Canada and Greenland. These skills allowed them to subsist in Greenland for eight centuries, almost twice as long as the Norse.

The Norse on the other hand brought practices of dairy farming and animal husbandry with them, practices which did not transfer so well to Greenland. To create more grazing pastures for livestock they removed forests, but this deforestation caused shortages in crucial resources such as lumber and firewood. They had to rely heavily on imports from Europe that were disrupted by the Black Death and trade routes freezing over. And unlike the Inuit who used blubber for heating, the Norse relied on firewood for heat. Even when farming became

increasingly difficult because of environmental degradation and climate cooling, the Norse clung to their pastoral ways because it was an integral part of Norse social identity.

Going back to our initial assumption that degradation of environmental resources happens because of failures of group decision making, Diamond outlines four main factors that contribute to the failures of group decision making: failure to anticipate future problems, failure to perceive present problems, failure to act, and failure to successfully solve the problem.

Failure to anticipate a problem often happens to societies because of no prior experience or sensitivity to the problem. However, prior experience doesn't guarantee problem anticipation, people forget, societies forget, history is repeated.

Failure to perceive present problems happens because some problems are literally imperceptible—we cannot know what we don't know. Diamond illustrates this as a society that may not yet have the technology or understanding to quantify a problem, but unknown unknowns are possibly a clue that the problem a society faces is a complex issue and, in some cases, it may also be a failure to recognize the full complexity of an issue or failure to anticipate complexity.

"Rational bad behaviour," (Diamond, 2005), often causes a failure to attempt to solve a problem. This factor usually arises out of a clash of interests (such as self-interest) and is characterized in the phenomena of the tragedy of the commons, the prisoner's dilemma, and the logic of collective action. Simply put, sometimes if a certain problem is ignored, a small group stands to profit in the immediate future at the expense of a larger group.

Even if the first three failures above are avoided, the implementation of a solution can still fail for many reasons. Solutions can backfire, be too costly, or be beyond our capabilities to execute successfully. There can even be a combination of these failures where a problem is perceived too late to implement the necessary changes.

In the case of the Greenland Norse, environmental degradation happened because of a failure to anticipate future problems of the climate turning cold on two levels: reasoning by false analogy (Diamond, 2005) and a lack of absorptive capacity. The Norse found land similar to home and assumed that farming would be a viable practice in Greenland also. As previously mentioned, they arrived during a mild

period of Greenland's natural climate fluctuations and had no way to anticipate how difficult raising their livestock would become when the climate turned cold. This struggle with the changing climate was only setting the stage for collapse. The second level the Norse failed on had to do with the fact that they had no prior experience with cold climate fluctuations. To apply Cohen and Levinthal's theory of learning and innovation (1990): the Norse lacked the absorptive capacity to recognize the value of new, external information (seal fishing from the Inuit) to adapt to the changing climate. As Diamond (2005) put it, "[…] the Greenland Norse in effect were deciding that they were prepared to die as Christian farmers rather than live as Inuit […]"

However, the Norse were unwittingly choosing their fate because no society intentionally chooses to fail but they do make choices that lead to failure, such as disastrously clinging to their cultural and social values. The very values that allowed them to survive for centuries—their European identity, their identity as dairy farmers, their Christian beliefs and conservative lifestyle (Diamond, 2005)—ultimately prevented them from adapting to a new lifestyle to survive.

Archaeological details tell us that the Norse in Greenland probably died off quite quickly, succumbing to starvation and by freezing to death (Diamond, 2005). Despite their failures, it remains impressive that the Greenland Norse managed to survive for 450 years in a country with extremely harsh and challenging conditions. Even modern-day inhabitants of Greenland do not have a self-sufficient economy and rely heavily on foreign aid. But nevertheless, Diamond has a good point when he states, "the Norse and the Inuit in Greenland provide the clearest illustration that a society's fate lies in its own hands and depends substantially on its own choices" (2005). As he makes clear in the title of this book, societies choose to fail or succeed, and we would argue that it is often the human factor of politics that involves social values and norms, culture, and public opinion that leads to the breakdown of the group decision-making process. In the case of the Norse, they did not decide successfully which core values to hold onto and which ones to swap out for new values to adapt to changing times. However, this examination of societal collapse does beg the important question, how much will values such as justice, morality, and ethics play into our own society's future survival?

## Are the dynamics of civilization inherently doomed to fail?

Canadian author Ronald Wright's book, *A Short History of Progress* (2019), is a condensed commentary on the progress of humanity on a grand scale. Wright speaks from a dominant voice of the times, from a Western, privileged, liberal, educated perspective. Nevertheless, he provides an honest critique on what Western civilizations have gotten wrong and the story of how history led us to the present day. Wright presents the stories of six civilizations: four of those are stories of failed civilizations and accompanying theories of why they failed, and the remaining two are about persisting civilizations and what was different that led them to survive. These stories are accompanied by the implications of growth and consumption, and commentary on capitalism and colonialism.

Like Diamond, Wright believes there is much to learn from human history. He frames it as "Gauguin's question" after the famous painter who asked, "Where do we come from? What are we? Where are we going?" (2019). Wright posits that if we can understand the answers to the first two questions, we might get a glimpse of the answer to the third question: "If we can see clearly what we are and what we have done, we can recognize human behaviour that persists through many times and cultures" (2019).

Early in his book, Wright introduces the concept of progress and the implications it has had throughout time for various civilizations. He describes progress as a myth that many Western cultures still believe in, but that many ancient cultures also exhibit a striving towards progress.

> *Sex, food, wealth, power, prestige: they lure us onward, make us progress. And to these we can add progress itself, in its modern meaning of material things getting better and better, an idea that arose with the Industrial Revolution and became its great article of faith. The two ancient societies whose careers I've outlined so far, Easter Island and Sumer, probably had no such notion of progress, yet they were seduced and ruined by their own desires all the same. But how typical were they of civilizations as a whole? Is civilization inherently maladaptive, an experiment doomed by its own dynamics? Ruins all over the Earth seem to say so. Yet the presence of modern civilization everywhere seems to contradict the past. (Wright, 2019)*

It is widely accepted that, although there were other extenuating circumstances, it was ultimately human environmental degradation that caused societal collapse for both the Easter Islanders and Sumerians, yet Wright seems to be making a claim that points to another cause, progress. The collapse of Easter Island and Sumer were absolute; there was no rebuilding of their civilizations.

Wright also examines the collapse of the Western Roman Empire and the Maya, both of which collapsed due to human environmental degradation that had negative ramifications on political and governance structures that led to collapse. The major difference is that these collapses were less absolute, and descendants of these societies survive in modern times. But, like the Eastern Islanders and Sumerians, Wright hints at another cause for collapse: "The careers of Rome and the Maya also show, I think, that civilizations often behave like "pyramid" sales schemes, thriving only while they grow" (2019).

In contrast, Wright explores the two ancient civilizations of China and Egypt and how they were different from the previous examples in important ways that allowed them to persist. Egypt simply did not have forests to mismanage. Their farming methods and innovations were conservative: they worked in tandem with natural cycles which ensured annual regeneration of fertile lands, and they made modest improvements to their methods that did not cause rapid increase in agricultural production thereby avoiding unsustainable population booms. China on the other hand has one of the largest and deepest deposits of fertile soil which was able to sustain enough agriculture to support a huge population. Despite both civilizations winning the ecological lottery, they were not without their hardships. In China, the Han Dynasty fell in the third century A.D., however the cause was more political than ecological (Wright, 2019). And in Egypt, the Old Kingdom collapsed around 2000 B.C. because of a series of floods that caused famine and revolt. The difference between the civilizations of Sumer, Maya, Rome, and Easter Islands in comparison to Egypt and China was that despite their hardship they did not pass the elusive tipping point of no return. The generous ecologies of Egypt and China provided them with enough of a buffer to weather the storm and rebuild their societies before their culture was completely lost.

Although reasons for collapse have been researched in detail, this elusive tipping point between survival and collapse is less defined. In fact, it probably exists not as a line, but a gradient where collapse can happen on various scales (refer to Figure 1.2) and in various domains (e.g. political, ecological), however we have found this perspective to be missing or incompletely articulated in the literature we reviewed on historical collapses.

Back to Wright's narrative on progress, he cautions that civilizations are most unstable when they are at their peak, when, "unless a new source of wealth or energy appears, it has no room left to raise production or absorb the shock of natural fluctuations. The only way onward is to keep bringing new loans from nature and humanity" (2019). However, to push beyond these limits is to push closer to the tipping point of collapse.

Wright introduces the concept of progress traps, "progress has an internal logic that can lead beyond reason to catastrophe" (2019). In this way, existential risks can be cloaked as progress; they may seem to offer us a great leap forward but in fact they may end up spelling our doom instead. One example of a progress trap that Wright offers is the atom bomb: "weapons technology was merely the first area of human progress to reach an impasse by threatening to destroy the planet on which it developed" (2019). Capitalism is another example of a progress trap: "the great promise of modernity was progress without limit and without end" (Wright, 2019).

> *John Steinbeck once said that socialism never took root in America because the poor see themselves not as an exploited proletariat but as temporarily embarrassed millionaires. This helps explain why American culture is so hostile to the idea of limits [...] Nowhere does the myth of progress have more fervent believers. (Wright, 2019).*

This hostility towards the idea of limits extends to all expressions of Western cultures to varying degrees, to societies that allow for unchecked capitalism and consumerism, including Canadian culture. This belief in progress is perpetuated by the societal myth of American (and by extension Canadian) culture of the "Self-Made Man"; that anyone can achieve success and riches if they persevere and work hard enough. The upward concentration of and striving for wealth caused by capitalistic systems ensures that the myth of progress lives on: "The concentration of power at the top of large-scale societies gives the elite a vested interest in the status quo; they continue to prosper in the darkening times long after the environment and general populace begin to suffer" (Wright, 2019).

This personal stake in perpetuating the status quo stymies our attempts to plan for the long-term future. "This human inability to foresee—or to watch out for—long-range consequences may be inherent to our kind, shaped by the millions of years when we lived from hand to mouth by hunting and gathering. It may also be little

more than a mix of inertia, greed, and foolishness encouraged by the shape of the social pyramid" (Wright, 2019).

From Wright's wisdom, we have extrapolated three key takeaways. First, as we have seen with past societies, our ability to continue agricultural practices that can feed our entire population is key. "Fossil energy not only powers but feeds the world. We are literally eating oil" (Wright,2019). This statement is an extreme expression of how our food systems rely on fossil fuels (e.g. powering farm equipment and tractors, petrochemical fertilizers, and the transportation of food). Whether or not we have reached peak oil is a heated debate, but one thing is for sure, fossil fuels will not last forever. Will we be prepared when the well runs dry? Wright's second takeaway is to learn from the past: "the health of the land and water—and of woods, which are the keepers of water—can be the only lasting basis for any civilization's survival and success" (2019). Mismanagement of ecological resources has spelled doom for many past societies, let us not let history repeat itself. Third, the myth of progress should be re-examined: not only does it lead to environmental degradation (see point two) but the myths we hold also affect our inability to feed the entire population of the world currently (see point one). This Western myth of the "Self-Made Man" is one factor that perpetuates global inequality: if only the developing countries could persevere and work hard, they could be as successful as the West.

In the span of civilization, globalization is a recent phenomenon, but we still have much work to do to change inequality within Canada and other developed countries, let alone to address global inequality. It is an important topic that deserves more attention than we can give it here. It is relevant to discuss in the context of existential risks because it is well understood that the underprivileged suffer the worst consequences in times of crises. As a parting thought: "We have the tools and the means to share resources, clean up pollution, dispense basic health care and birth control, set economic limits in line with natural ones. If we don't do these things now, while we prosper, we will never be able to do them when times get hard" (Wright, 2019).

### Does the increasing complexity of societies ultimately always lead to collapse?

Tainter's book on the *Collapse of Complex Societies* (1988) is widely known in the field for his critique and assessment of how societies have historically collapsed. In our research, to have a broad understanding of factors contributing to existential

risks in contemporary societies, we found it constructive to analyze Tainter's theories of collapse. Tainter's assessment reflects analysis of internal dynamics of complex societies that cause societies to collapse over a period with the help of economic theories.

Tainter begins by explaining the relationship between energy flow and complex sociopolitical institutions and argues that they both fall on the opposite side of the spectrum. He builds on it by saying, "From the simplest familial unit to the most complex regional hierarchy, the institutions and patterned interactions that comprise a human society are dependent on energy" (1988). Tainter describes how no sociopolitical system can thrive without energy flow, and he further adds, "Not only is energy flow required to maintain a sociopolitical system, but the amount of energy must be sufficient for the complexity of that system." The more complex the sociopolitical system, the more energy is needed to keep it thriving. "Energy flow and sociopolitical organization must evolve in harmony" (Tainter, 1988). In the context of our research, this implies that the highest contributing factors to existential risks may occur from sociopolitical systems that lack flow of constant energy. Thus, one might think that resilience in a society may be increased if there is constant flow of energy in the sociopolitical systems that eventually regulate the distribution of resources, opportunities, and social status. Note that this does not mean a constant input of energy, as that would result in increasing complexity and increasing demand for more energy creating a doomed cycle, or what Wright would label as a progress trap.

Tainter draws on the concepts of marginal productivity or marginal return on investment to explain how increases in complexity of a system ultimately leads to increased inefficiencies in the system. "The marginal product of any input is the increase in the total output resulting from the input" (Tainter, 1988). According to him, when marginal productivity of a society decreases beyond a certain point, it can no longer survive. In the context of our research, understanding how a society reacts to rising complexity is vital. As Canadian society grows increasingly complex, it may become more vulnerable to future potential risks that can threaten its own survival. For example, despite having large agricultural lands, the Canadian food system may become vulnerable due to inefficiencies and growing demand for food in the future caused by increasing population growth and complexity. "Sociopolitical organizations constantly encounter problems that require increased investment merely to preserve the status quo" (Tainter, 1988). Despite increasing efforts to meet increasing demand—whether it be in the food system, energy or other resources—decreasing efficiency works against it because of marginal productivity or marginal return on investment.

Tainter proposes four concepts to understand complex societies and why they collapse:

- Human societies are problem-solving organizations
- Sociopolitical systems require energy for their maintenance
- Increased complexity carries with it increased costs per capita
- Investment in sociopolitical complexity produces marginal returns on investment

Tainter's explanation for collapse, which he believes applies to all past societies, is that there is an economic imperative; societies start off with a surplus of resources, however, overpopulation and growing needs of society extensively use up the easiest resources first. From our interview data, it was clear that in the current system most of the existential risks are associated with the growing demands of society resulting in a decline of resources. Inevitable advancements in technology, growing urban populations, and exponentially growing demands on resources are contributing to present day existential risks. According to Tainter, technological innovation responds to market factors, particularly to individuals' needs and to economic distress that creates opportunities for creative solutions. He further explains how some societies sustain socioeconomic growth without technological advancements, instead they acquire new 'energy subsidies' through territorial expansion, which he suggests can be more effective.

According to Tainter, 11 major themes can be used to explain collapse:

- Depletion or cessation of a vital resource or resources on which a society depends
- The establishment of a new resource base
- The occurrence of some insurmountable catastrophe
- Insufficient response to changing circumstances
- Resource competition with other complex societies
- Intruders (i.e. violent conflict)
- Class conflict, societal contradictions, elite mismanagement or misbehavior
- Social dysfunction
- Mystical factors (i.e. declining national values and identity, or declining morals and virtues)
- Chance concatenation of events
- Economic factors

Having set up his theory, Tainter tries to apply it to three cases: the Western Roman Empire, Classic Maya in Southern Lowlands, and Chacoan society in American Southwest all experienced collapse due to increasing costs of complexity. For instance, in the Western Roman Empire, the expansion of the army and bureaucracy increased the costs. In Maya Lowlands and Chaco Canyon, late building surges contributed to costs. Abandonment of territory by Mayans and Chacoans suggested environmental damage. Decline in population or stagnation was evident in all three societies. In each case, the system became expensive with decreasing benefits. It is evident that a complex society that is prone to collapse will show signs of decreasing benefits as it does not have the capacity to withstand growing complexities.

From Tainter, we extrapolate four themes of collapse:

- Parkinson's Law – Complex systems inevitably succumb to diminishing returns. Even if other things remain equal, the costs of running and defending an empire eventually grow so burdensome that it becomes more efficient to throw off the whole imperial superstructure and revert to local forms of organization.
- Runaway Train – a disastrous course from which they could not deviate
- The Dinosaur – the ruler's failure to tackle the problem qualifies them as dinosaurs
- House of Cards – a swift and irreparable fall

The first, Parkinson's Law, Tainter argues is an inevitability of societies that increase in complexity. The other three—Runaway Train, The Dinosaur, and House of Cards—rather characterize the nature of the collapse.

We considered Tainter's theory of Parkinson's Law (relevant to our scope of research) as a framework to identify three overarching domains that could contribute to complexity of the Canadian system and may lead to its collapse. This may help us construct a holistic response to mindfully address these risks and if implemented may achieve more resiliency for the system. To put these domains into perspective, we also used insights from our interviews. These domains were classified as follows:

**Resources:** Despite Canadian society having access to abundant natural resources, insufficient response to mitigate depletion of resources could contribute to environmental degradation and climate change, adding more pressure on the system. If water supplies become scarce due to water demands from the U.S. on the Great Lakes and lack of infrastructure to access other Canadian water sources,

Canadian agricultural efficiency may decline, consequently putting more pressure on the water and food systems. Poorly managed transitions have the potential to bring vulnerability and instability within the energy system, weakening its capacity to withstand increasing complexity from building new energy resources.

**Social Stratification:** Like any society, the current Canadian system is rooted in social hierarchies. These hierarchical layers are further stratified by factors such as accumulation of wealth and power and lack of social mobility. If these hierarchies tend to become too rigid over time, i.e. if the wealth gap and other inequalities continue to increase and if there is no rebalancing possible through social mobility or government policies, the complex Canadian system may have higher risks of social unrest and collapse. Indigenous communities, racialized groups, and individuals with disabilities may be at a greater disadvantage because of increasing social stratification.

**Economy:** As the Canadian system faces potential decline in resources because of climate change and depletion of non-renewable resources, the pressure on its economic system will also increase due to higher investment costs of resource acquisition. It may become more difficult in the future for the Canadian society to achieve the same level of returns on investments in resources and related infrastructure. There is a higher risk of Canadian system becoming more dependent on a single sector or industry for its economic success that may bring in more vulnerabilities in the system.

According to Tainter, any nation vulnerable to collapse will have to pursue one of three options: "(1) absorption by a neighbor or some larger state; (2) economic support by a dominant power, or by an international financing agency; or (3) payment by the support population of whatever costs are needed to continue complexity, however detrimental the marginal return" (1988). While these may have been previously effective strategies for societies to avoid collapse, for our solution-finding phase we find it worthwhile to explore non-colonial and more hopeful alternatives that may inform our mitigation and adaptation strategies to existential risks.

In conclusion, Tainter believes in the existence of simple forms of organization of societies that are sustainable, reasonable, and more productive in nature. A collapse denotes a rapid and substantial decline from an established level of socio-political complexity. Political decentralization within any system has ramifications on social facets such as art, literature, and other cultural phenomena. In the absence of a continuous establishment and sustenance of legitimacy, leaders,

political parties, and governmental bodies tend to become dysfunctional. Socio-political organizations constantly encounter problems that necessitate increasing investments simply to maintain the status quo. These investments take the form of enlarging bureaucracies, increasing specialization within bureaucracies, developing cumulative organizational solutions, escalating costs of legal and legislative activities, and amplifying costs of internal control and external defense. As the number and cost of organizational investments increase, the proportion of a society's budget that can be allocated to future economic growth inevitably declines.

## Conclusion

From Diamond we learned that there are five factors that often influence collapse:

- human-caused environmental damage
- natural climate change
- increasingly hostile neighbours
- decreasing support from friendly trade partners
- society's response to its environmental problems

Of these five factors, environmental problems are present in all cases and are usually exacerbated by other factors on the above list. Irreversible environmental damage leading to collapse is the result of failed decision making. We also learned that decision making can fail in four unique ways:

- failure to anticipate future problems
- failure to perceive present problems
- failure to act
- failure to successfully solve the problem

These factors of failed decision-making parallel concepts of awareness, mitigation, and adaptation from the Emergency Management field. Increased awareness helps address failure to anticipate future or perceive present problems. Mitigation ensures that there are strategies to prevent future problems from materializing. Adaptation strategies allow for action to respond to problems that are unfolding. Failure to successfully solve the problem requires us to borrow frameworks from design thinking to address. Prototyping solutions and learning from failed attempts are strategies for solving any

problem of any magnitude. However, it is important to mention that prototyping can begin at the awareness stage once a future risk is identified. Working on solution attempts at this early stage allows for maximum iterations and mitigates the risk of not successfully solving the problem.

From Wright we have learned that the combination of environmental degradation with unsustainable population growth has often caused societal collapse. They form a negative reinforcing loop: productive agricultural farming and surplus food lead to population booms, population booms demand more intensive farming of the land to sustain growth, sustained growth degrades the environment and reduces the productivity of the land, less food yield leads to starvation, and then if a new resource of fertile land is not found the population collapses. He cautions that unchecked consumption and capitalism are leading us down this path of fatal depletion of natural resources. The myths that reinforce this self-destructive behaviour and the values and worldviews that support it need to be re-examined and interrogated. Lessons from history need to be leveraged to overcome our human bias towards short-sighted thinking and failure to remember that often leads us to repeat mistakes of the past.

From Tainter we have learned that societies default to increasing complexity, which leads to diminishing returns. Often these diminishing returns pressure societies to find new resources or "energy subsidies" to sustain growth. This often takes the form of migration to lands with untapped resources while the depleted resources can regenerate, but this prospect is becoming very limited if not impossible in modern times. What Tainter implies seems to be twofold: 1) that a cycle of growing complexity leading to eventual collapse is inevitable and the result is either terminal or is followed by a period of rebuilding and regeneration; or 2) that we forestall inevitable collapse by colonizing new energy sources in perpetuity.

There are a few similarities we can draw between these scholars. Like Diamond, Tainter also identifies failed decision-making as a reason for collapse which he characterizes as the ruler's failure to tackle the problem qualifies them as "The Dinosaur," or, in other words, extinction by inability to adapt to changing circumstances. Progress traps and unchecked growth are a downfall of society that Tainter and Wright share. Fundamentally, all three scholars recognize environmental degradation as a leading factor of societal collapse.

## 3.2.2 Existential Risks (Water, Energy and Food)

### Why water, energy and food?

Water, energy and food form a nexus at the heart of sustainable development. Agriculture is the largest consumer of the world's freshwater resources, and water is used in the production of most forms of energy (*Water, Food and Energy*, n.d.). In short, water, energy and food are interdependent and demand for all three is increasing rapidly. "25,000 die every day in the world from contaminated water alone." (Wright, 2022). Having access to abundant water resources is not the same as having sufficient access to clean drinking water, and as water scarcity increases, its ability to sustain the needs of society will be strained. Understanding the availability, quality, and distribution of water is critical to ensuring food security, maintaining public health, and reducing the impact of climate change on water resources.

Many common energy sources (fossil fuel, coal, waste incineration) have negative impacts on air quality. Take, for example, "[...] the millions of deaths caused every year by air pollution resulting from burning fossil fuels." (Diamond, 2019). The production and consumption of energy has significant environmental and social impacts, including greenhouse gas emissions, air pollution, and the displacement of communities. Studying the energy system involves understanding the sources of energy, the technologies used to produce and distribute it, and the policies and regulations that govern its use.

According to the Food and Agriculture Organization of the United Nations, 828 million people were affected by hunger globally in 2021 (*UN Report*, 2022), and an estimated 9 million people die from hunger-related causes every year (*In World of Wealth, 9 Million People Die Every Year from Hunger*, 2021). Studying the food system involves understanding the production, distribution, and consumption of food, as well as its environmental, social, and political impacts. Building overall resilience in society requires addressing issues such as food waste, food insecurity, and the impact of climate change on food production.

It is important to note that water, energy and food systems have many interdependencies. Energy is critical for both agriculture (manufacturing chemical pesticides and fertilizers, powering farm equipment, shipping and distribution of agricultural products, and processing food products) and water (pumping underground water, pumping water to elevated reservoirs of urban settlements, purification of water, and treatment of wastewater). Water is critical for agriculture (crop irrigation). To withstand current and future pressures, governments must ensure integrated and sustainable management of water, energy and food to balance the needs of people, nature and the economy.

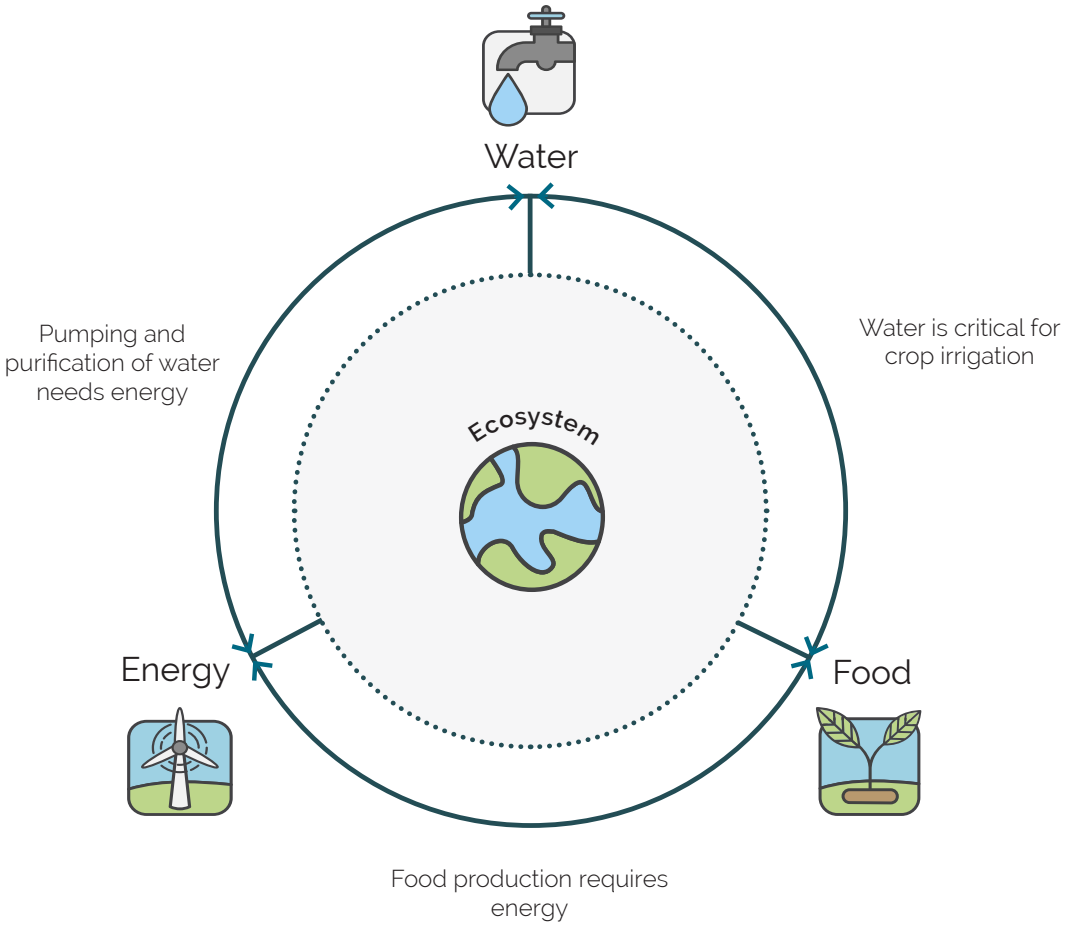



*Figure 3.18 Water, energy and food*

## Water Scenarios

### Step 1 – Scanning Suitable Scenarios

The report *Global water futures 2050: Five stylized scenarios* by Gilberto C. Gallopín (2012) was produced in partnership with the United Nations Educational, Scientific and Cultural Organization (UNESCO), as part of the fourth World Water Development Report (WWDR4). We chose to review this report because of the global reach and responsibility of the partnering organizations and their commitment to objective research. Other reports we researched include: *Water footprint scenarios for 2050: A global analysis* (Ercin and Hoekstra, 2013) which focuses on developing quantitative models, *Changing currents: Water sustainability and the future of Canada's natural resource sectors* (2010) which focuses on water resources' impact on the future of agriculture, forestry, mining, and energy but did not present trends or scenarios, and *Water futures for the world we want* (Schuster Wallace et al., 2019) which focuses on water challenges and opportunities for Canada but did not present trends or scenarios. Because we were looking for trends related to water, we chose to analyze *Global water futures 2050: Five stylized scenarios* and to extrapolate those trends to a Canadian context.

### Step 2 – Evaluation of Framework

In this report, the experts used a version of the 2x2 Matrix, a foresight scenarios development tool; rather than just two, nine critical dimensions (uncertainties) were identified. These nine dimensions shown in Figure 3.19 are framed as either being high or low in each scenario.

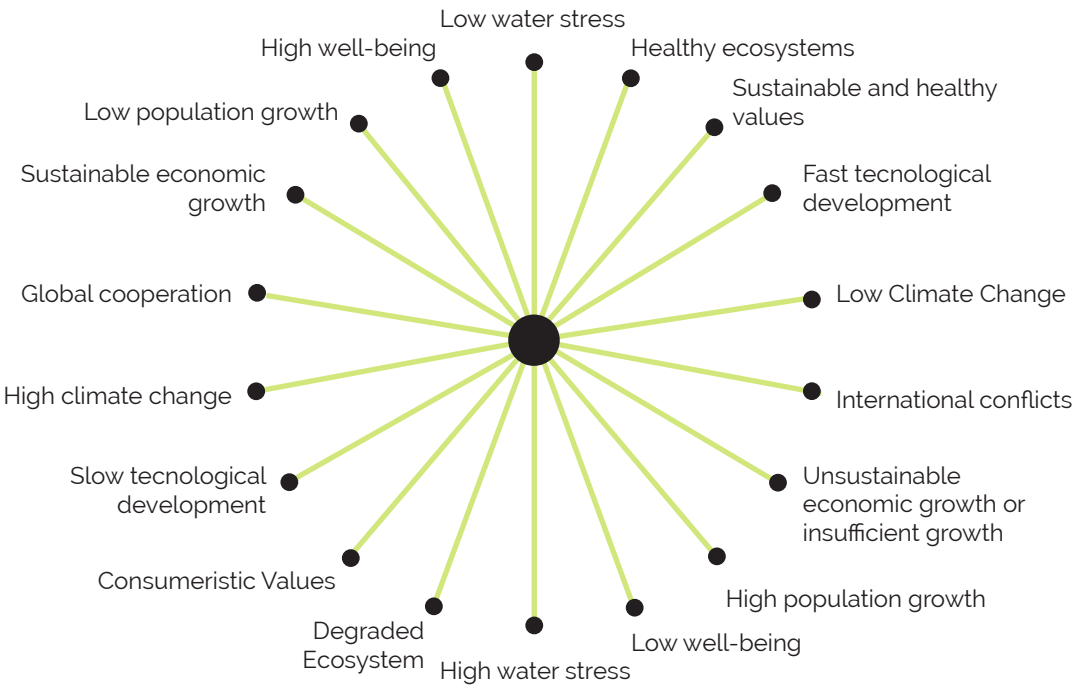



*Figure 3.19 The nine critical dimensions used to develop future water scenarios*

The following framing question can be inferred to have guided the development of the scenarios: How are the nine dimensions likely to interact and affect global water trends by 2050?

Before the five scenarios were developed, the author conducted research into key trends of ten domains: demographic, economic technological, water resources, water infrastructure, global climate change, environmental (including agriculture), social, cultural and ethical values, institutional and governance, and political. The report does a thorough analysis of global trends; however, we have summarized the most relevant ones for our research. Our additions or amendments are denoted in square brackets.

### Demographic

- Migration trends – environmental refugees and climate migrants; people displaced by national armed conflicts [including conflicts over water] and resource degradation
- Water-related diseases affecting humans

### Economic

- Economic globalization (increasing interdependency among nations; possibility of new global economic crisis—and synergies)
- Cost of food, water and energy (implications for hunger and poverty, and competitiveness of alternative water-related technologies, e.g. desalination, solar, irrigation)
- Evolution of capitalism through qualitative change

### Technological

- Weather manipulation and control [and unintended effects on climate change]
- Water Resources
- Water stocks, including geographic and temporal distribution, renewability, quality and availability (as affected by climate change, by ecosystem processes, by agricultural, industrial and drinking consumption, and by technology employed)
- Water Infrastructure
- Transbasin and transboundary water transfers
- Obsolescence of existing waterworks (e.g. due to climate change as well as ageing)

### Global Climate Change

- Increasing frequency of extreme climatic events (i.e. droughts and floods, [and severe storms and tornadoes that can destroy infrastructure])
- Changes in agro-climatic zones
- Spread of alien species (including pests and pathogens) as habitats change

### Environmental (including agriculture)

- Environmental impacts of mitigation and adaptation measures adopted in response to global climate change
- Possible trespassing of global tipping points and new and emerging environmental surprises
- Water-related diseases [affecting nonhuman beings]
- Negative effects on agricultural practices including soil erosion and degradation, reduced irrigation and water quality
- Deterioration of ecosystem health including deforestation, groundwater

depletion, and loss of biodiversity

### Social, Cultural and Ethical

- Poverty and inequality (affecting conflict potential, migration pressure, local and global environmental degradation, local and global human health, and population growth)
- Culture and values (including global cultural homogenization and shifts in ethical, religious and spiritual values) as they affect lifestyles and consumption patterns
- National food self-sufficiency versus global food security
- Equity in access to water, sanitation, education, food and employment

### Institutional and Governance

- Proactive decision-making (anticipating policy consequences and negative impacts)
- Global, national and local water policies, regulations and laws
- Transboundary basins with information sharing and cooperative integration of water management into national socio-economic development plans
- Changes in corporate behaviour (i.e., corporate social responsibility)
- Degree and pervasiveness of corruption
- Global security trends: national and regional water conflicts; international conflict arising from global inequalities; expansion or mitigation of global terrorism, international crime, arms traffic, drugs traffic; new mechanisms for conflict resolution
- Potential for use of water or water infrastructure as a medium for biological terrorism

### Political

- Global power structure (e.g., from a unipolar to a multipolar world); weakening or strengthening of multilateral and intergovernmental decision-making bodies (e.g., the United Nations); implications for global equity, enforcement of international agreements and law, and global sustainability
- Possible trends towards isolationism versus increased interdependence and their impacts on steering of the globalization process in its multiple dimensions to minimize negative impacts and conflict
- Development policies and aid to economically weak and water-stressed

countries
- Evolution of democratic forms of government and public participation

### Step 3 – What do these trends mean for Canada?

**Demographics** – As a country rich in freshwater, Canada could the experience an influx of migrants from water-stressed countries (including migrants from southern U.S.) if water scarcity increases

**Economic** – Water exportation from Canada to the U.S., and appropriation of water resources by the U.S. for their strategic growth and/or survival could increase

**Water Infrastructure** – Canada may need to build new water infrastructure to harness its Northern freshwater resources

**Global Climate Change** – Climate change could unlock new fertile agro-climatic zones in Canada's Northern regions, but could also create challenges for these water resources (e.g. harmful algae blooms, destruction of infrastructure)

**Social, Cultural and Ethical** – Canada currently struggles to serve all its population with fresh, clean drinking water, especially within remote and Indigenous communities, which could be a barrier to achieving future equality if not addressed

**Institutional and Governance** – Canada shares four of five Great Lakes with the U.S. and managing these resources may require increased cooperation and governance

**Political** – Canada provides a high amount of development aid in absolute dollars—Canada ranked the 7th top provider of Official Development Aid in 2022 (*Official Development Assistance*, 2022)—and as agricultural and water resources potentially shift in favour of Canada, other countries may expect Canada to provide more aid to economically weak and water-stressed countries

## Energy Scenarios

### Step 1 – Scanning Suitable Scenarios

The *World energy outlook* 2022 (2022) report produced by the International Energy Agency explores the causes of today's global energy crises and the consequences. It provides a projection for energy markets and energy security through a scenario planning methodology. Other reports we researched include: *The energy transformation scenarios* (Bentham, 2021) which presents a number of interesting energy trends but the framework for developing the scenarios is unclear and the perspective is potentially biased by the motives of the publishing corporation (Shell International B.V.), and *The future of energy* (Tuff, 2020) which has a clear framework for developing scenarios but does not focus on presenting energy trends. Because of the unbiased nature of the *World energy outlook 2022* report and its detailed exploration of energy trends, we chose to analyze and extrapolate trends for Canada from this research.

### Step 2 – Evaluation of Framework

The report outlines various forces that are impacting the energy sector today and the policy responses and assesses the implications for our outlook in 2022.

The author states that the modelling framework that produces these scenarios is a dynamic one, covering all fuels and technologies, reflecting the realworld interplay between policies, costs and investment choices, and providing insights into how changes in one area may have (often unintended) consequences for others.

The following framing question can be inferred to have guided the development of the scenarios: How will rising demand for energy services, driven by powerful underlying economic and demographic forces, be met by 2030, 2040, 2050, and 2100? To answer this research question the report explores three scenarios:

*The Stated Policies Scenario (STEPS) shows the trajectory implied by today's policy settings. The Announced Pledges Scenario (APS) assumes that all aspirational targets announced by governments are met on time and in full, including their long-term net*

*zero and energy access goals. The Net Zero Emissions by 2050 (NZE) Scenario maps out a way to achieve a 1.5 °C stabilisation in the rise in global average temperatures, alongside universal access to modern energy by 2030. (World Energy Outlook 2022, 2022)*

The report does a thorough analysis of global trends; however, we have summarized the most relevant ones for our research. Our additions or amendments are denoted in square brackets.

### Economy

- Despite high gasoline and diesel prices, demand is set to increase slightly as the world economy recovers from the COVID-19 pandemic
- Demand for oil in the buildings sector falls in advanced economies as an increasing number of countries and jurisdictions have banned sales of new fossil fuel boilers
- Demand for oil in the buildings sector increases in emerging market and developing economies as a result of increasing demand for liquefied petroleum gas (LPG), especially for cooking in Asia and Africa
- In energy importing economies, higher prices for fuels and electricity reduce economic output (by lowering the net incomes of households and raising the production costs of businesses)
- The global oil market today is grappling with huge nearterm and longterm uncertainties (e.g. China's future oil use, sanctions on Russia)
- Disruption to food supply chains and high fertilizer prices mean liquid biofuel costs have soared

### Energy Resources

- New oil resources discovered in 2021 were at their lowest level since the 1930s and global refining capacity fell in 2021 for the first time in more than 30 years
- The oil industry is facing challenges in accessing financing, with supply chains becoming stretched and costs rising
- Rising demand for road freight, aviation and shipping transport causes oil demand to rise
- Oil for power generation continues to decrease as the use of renewable sources continue to grow
- Increasing cybersecurity threats can compromise the reliability of electricity

supply

### Society

- As a result of soaring energy prices, millions of people risk losing the most fundamental form of energy security by becoming unable to afford basic energy services

### Environment

- An increasing number of countries have introduced or announced policies to reduce singleuse plastics and improve recycling levels, but demand nevertheless grows
- Policies and falling battery costs support increasing use of electric or fuel cell vehicles
- Oil used to produce plastics increases as growth in emerging markets and developing economies outweighs efforts to reduce and recycle plastics
- Countries without net zero emissions pledges are still under global pressures to reduce oil and gasrelated emissions (to reduce the global average emissions)
- Policies, reduced costs, and increased capacity support increasing investment in wind turbines
- The rapid expansion of wind power generation and EVs brings with it more demand for rare earth elements
- Recycling metals used in the energy transition will not only ease the burden on their primary supply via mining, but better treatment of waste streams will reduce the risk of several hazardous materials entering the environment and polluting land and water resources
- The growing frequency and intensity of extreme weather events presents major risks to energy infrastructure and supply

## Step 3 – What do these trends mean for Canada?

**Economy** – Canada could experience energy insecurity and slower economic growth due to increasing energy prices; an inefficient or untimely energy transition could mean a severe reduction to Canada's economy by disrupting supply chains and the flow of goods

**Energy Resources** – Canada's reliance on non-renewable energy resources could cause challenges in energy security and emissions if the transition to the new energy economy is mismanaged

**Society** – High cost of electricity could contribute to sharp increase in extreme poverty in Canada widening the wealth inequality gap, as well energy infrastructure risks have the highest potential impact on energy security of remote and vulnerable communities within Canada

**Energy Demand** – Canada's low population density and large land mass increases our oil reliance from personal travel, road freight, aviation and shipping transport until suitable fuel alternatives are adopted. Canada's four seasons means that heating or cooling is required in buildings most of the year, with the potential for more extreme weather to exacerbate this factor

**Environment** – Canada has joined over 120 countries in committing to net-zero emissions which could lead to positive changes that address the challenges of climate change, energy affordability, and energy security

**Politics** – Canada's perceived lack of political will to adopt progressive energy policies could slow our transition to the new energy economy and hinder our ability to meet our net-zero promises

## Food Scenarios

### Step 1 – Scanning Suitable Scenarios

The report *Shaping the future of global food systems: A scenarios analysis* (2017) includes mixed perspectives of World Economic Forum (WEF), a public organization in collaboration with Deloitte Consulting LLP, a private sector organization. WEF presented this report as part of its System Initiative that aims to create systemic change on global challenges. Other reports we researched include *Four futures for the global food system* (Unnikrishnan et al., 2022) which focuses on impacts for private sector companies, multilateral organizations, and governments and does not present food trends or scenario framework extensively. Many other reports we found focused narrowly on certain trends (e.g. lab grown meat, insect protein) or were focused on quantitative modelling. We chose to analyze *Shaping the future of global food systems: A scenarios analysis* because of its clearly articulated framework and trends that we could extrapolate to a Canadian context.

### Step 2 – Evaluation of Framework

In this report, the experts derived the framework for sustainable future of global food systems by focusing on essentials required for achieving the UN's Sustainable Development Goals (SDGs), in which an efficient, nutritious, and healthy food system was one of the significant elements.

The following framing question is used to develop the scenarios: how will food systems nutritiously and sustainably feed 8.5 billion people in 2030? The focal question was determined by identifying predictable forces of change (trends) that unpredictably impacted the focal question and informed the future scenarios. While designing future scenarios, the experts chose to focus on the two most critical uncertainties:

- **Demand Shift** that encompassed the nature of future demand for food and agricultural commodities which will either be resource-intensive or resource-efficient
- **Markets** that pertain to the openness of trade, trust in and resilience of commodity markets, and inclusivity of technological innovations that will be

defined by high connectivity versus low connectivity

The 2x2 Matrix was employed to explore potential futures, looking at different combinations of critical uncertainties that lead to four possible scenarios for the global food systems.

The matrix revealed four scenarios for the global food systems.

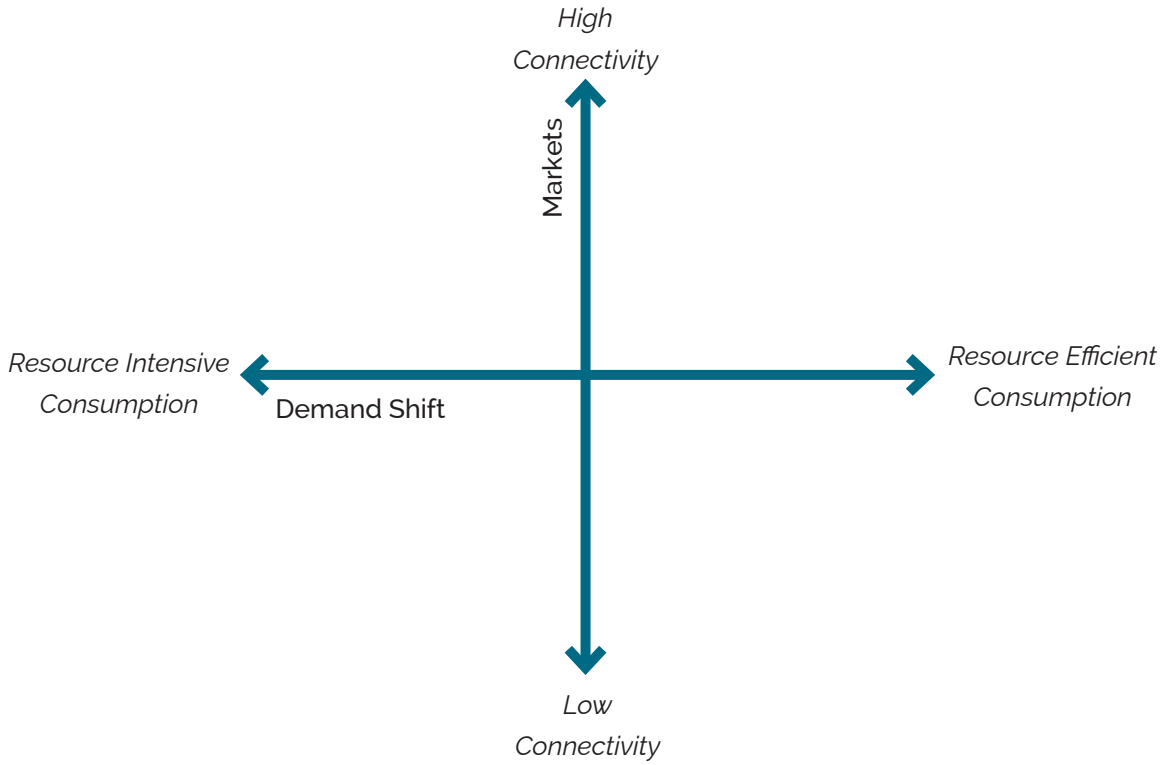



*Figure 3.20 The 2x2 Matrix used to develop future food scenarios*

The report identifies six predictable forces of change (trends) that might pose challenges to the future of global food systems. However, we have summarized the most relevant trends for our research study. Our additions or amendments are denoted in square brackets.

### The Triple Burden of Malnutrition

- Over 2 billion adults are overweight or obese
- Poor nutrition and health habits can lead to non-communicable diseases (economic burden and costs of NCDs radiate through households in the form of lower wages and savings straining health and welfare systems)

### Natural Resources

- The food sector accounts for 70% of water withdrawal. Agriculture, forestry and other land use accounts for almost a quarter of global greenhouse gas emissions
- Water withdrawals have increased threefold over the past 50 years and demand is expected to rise by a further 40% by 2030

### Geopolitical Dynamics

- Growing political conflicts and movements are evidenced by recent events, (Nationalist and isolationist tendencies that may impact global collaboration and trade agreements [i.e. increasing conflict between NATO and other Western allies on one side with the rising superpower that is China, and Russia's war on Ukraine and other threats to the stability of regional peace in Europe])

## Step 3 – What do these trends mean for Canada?

**The Triple Burden of Malnutrition** – The presence and prevalence of food insecurity in Inuit households ranked seven times higher than non-Indigenous Canadian households. The Inuit, the Indigenous people of the Canadian Arctic, face severe food insecurity rooted in failed government systems and neglect. This sheds a light on inequality in Canadian food systems and how they are tied to healthcare and social systems of Canada, which have been made even more vulnerable by the impacts of the recent pandemic.

**Natural Resources** – Canada, by total area including its waters, is the second largest country in the world and has a diverse array of landscapes and geology from coast-to-coast. This could counterintuitively create a situation where the consumption of both renewable and non-renewable resources may exceed the rate at which they are replenished, leading to potential scarcity of these natural resources. For example, climate change could decrease arable land in the U.S., putting pressure on Canada to produce more food and causing fertile land in Canada to become over-farmed.

**Geopolitical Dynamics** – As previously mentioned, increased demand for natural resources related to water, energy and food are increasing as the global population grows. These increased demands put pressure on Canada to respond to that

demand and could cause increasing geopolitical tensions between Canada and other countries such as the U.S., China, and Russia.

## Conclusion for Water, Energy and Food

Through these findings, we have uncovered existential risks that exist today or may occur in the future due to increasing vulnerabilities and complexities in the system. It is vital to understand the long- and short-term impacts of existential risks within Canadian systems in terms of severity and scope, to inform the urgency and response time for tackling these risks before suggesting any recommendations. Some key drivers and vulnerabilities leading to existential risks overlap with one another and therefore can be tackled together with a more holistic approach. For example, existential risks such as water and food scarcity emerge from degradation of the environment (from climate change); creating a response strategy to mitigate climate change can address and minimize common vulnerabilities leading to these existential risks. Having said that, these findings offer a broader understanding of several existential risks that are connected to one another. Identifying these relationships within the system can inform better mitigation strategies and enable stakeholder involvement in our framework of resilience. Thus, to build a more resilient Canadian system, these existential risks provide a framework through which we can mindfully recommend strategic actions and policies that can increase a system's ability to withstand changes in the future.

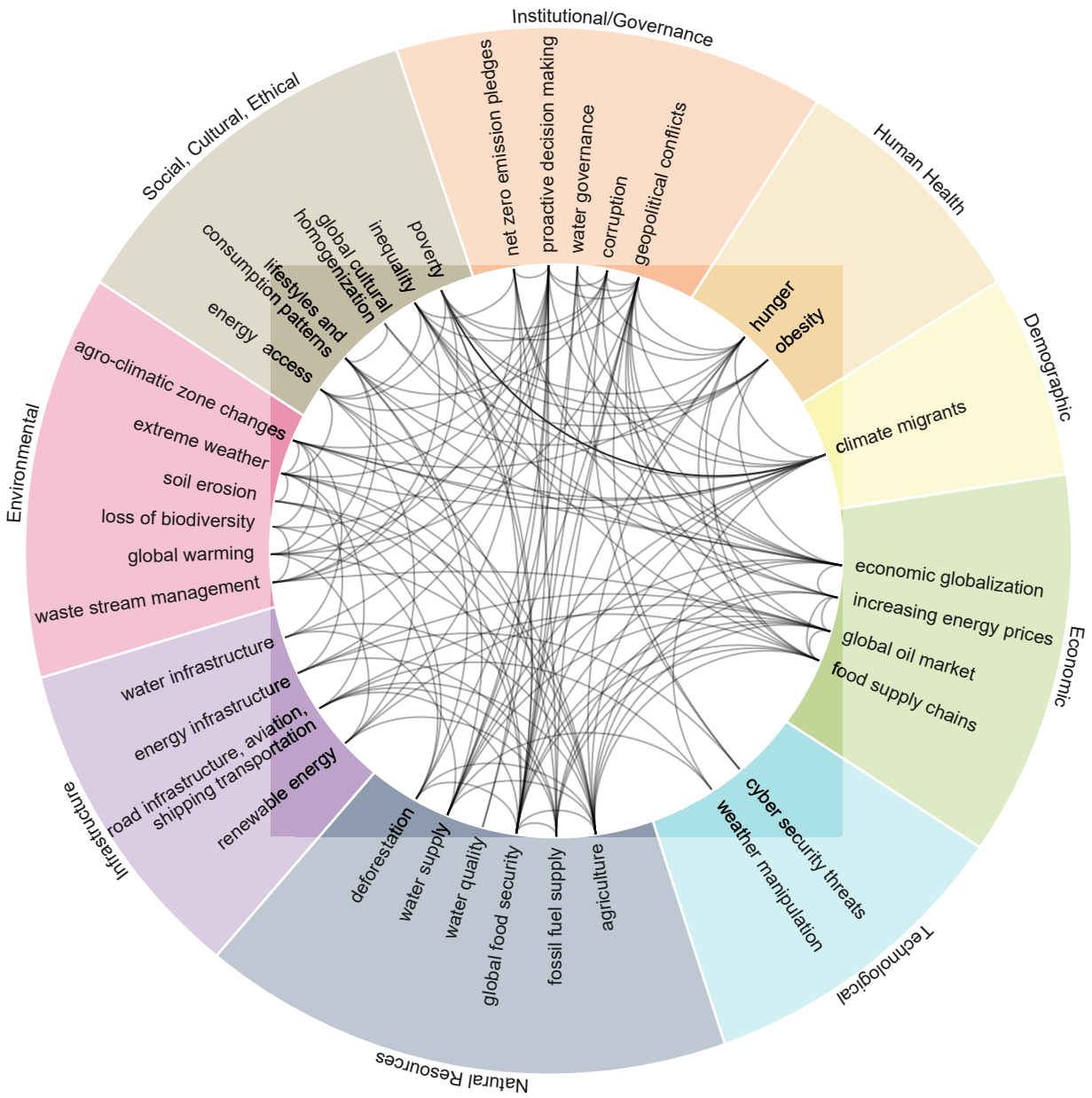



*Figure 3.21 Interdependencies related to water, energy and food*

## 3.2.3 Resilience

### National Resilience Factors

In the book *Upheaval*, Jared Diamond parallels personal crises with national crises: "At one or more times during our lives, most of us undergo a personal upheaval or crisis, which may or may not get resolved successfully through us making personal changes. Similarly, nations undergo national crises, which also may or may not get resolved successfully through national changes. There is a large body of research and anecdotal information, built up by therapists, about the resolution of personal crises. Could the resulting conclusions help us understand the resolution of national crises?" (2019). He points to personal crises in our lives and situations that force us to realize that our previous coping mechanisms are no longer useful, and the need to find new ones as being similar to how nations must address crises.

To explain this concept further, Diamond demonstrates a study of six modern nations and the factors that helped or hindered their ability to overcome a crisis. In essence, it is an evaluation of these nations' resilience. He starts with the countries of Finland and Japan where he explains that the crises that exploded into sudden upheaval were provoked by shocks from another country. The second pair, Chile and Indonesia, deal with crises that exploded because of internal tensions. And for the final pair, Germany and Australia, he outlines how crises did not explode suddenly but instead unfolded gradually especially due to stresses unleashed by World War Two.

Diamond explores 12 factors and whether they positively or negatively affected the nation's ability to overcome its crisis. The table in Appendix C compares all six modern nations and what strategies comparatively helped or hindered them (2019). The 12 factors are:

- National consensus that one's nation is in crisis
- Acceptance of national responsibility to do something
- Delineating the national problems needing to be solved
- Getting material and financial help from other nations
- Using other nations as models of how to solve the problems
- Strong national identity
- Honest national self-appraisal

- Historical experience of previous national crises
- Dealing with national failure
- Situation-specific national flexibility
- National core values
- Freedom of action and freedom from geopolitical constraints

Some interesting patterns emerge when we compare strategies of modern nations to overcome adversity (see Table 3 in Appendix B). In all six nations, the ability to delineate the national problems to be solved positively affected the outcome, therefore it is in a nation's best interest when facing crises to properly frame and understand the problems at hand. On the other hand, freedom of action and freedom from geopolitical constraints often negatively impacted or, at best, neutrally impacted the nation facing a crisis. While this factor is largely out of the nation's control, it underlines the need for awareness of these constraining factors, so that strategies for resilience can compensate for uncontrollable negative factors.

Situation-specific national flexibility was a positive factor in the three cases (Finland, Japan and Chile) in which it was observed. This factor can also be understood to describe a nation's adaptability or ability to abruptly change course. In all three cases, decisions were made that were unexpected because they contradicted previously held beliefs or ideologies.

The factor that appeared second most frequently in having a positive impact (for Finland, Japan, Chile and Germany) was, perhaps surprisingly, the experience of dealing with national failure. Failure is very closely aligned with flexibility, because trying new and unexpected approaches is not guaranteed to work, especially on the first try. Failure in this context is limited and is not the societal level collapse we often talk about in this research. These failures, while unfortunate setbacks, do not prevent a nation from rebuilding, but serve to impart valuable lessons to the suffering nations.

Because three of the four previously mentioned nations (Finland, Japan and Chile) were identified as having both flexibility and failure help them through their crisis, one can conclude that failure does not make these nations more risk adverse, but possibly the opposite. Failure might highlight an area where a nation was too rigid to make the necessary changes to overcome a crisis previously, so that they might have the courage to make that change in the future.

A strong national identity is a factor worth noting. In addition to flexibility and failure, Finland, Japan and Chile demonstrate that a strong national identity helped in overcoming the crisis. In two cases (Indonesia and Australia) a weak national identity was perceived to have negatively impacted the outcome of the crisis. This evidence suggests that a strong national identity is another key factor of national resilience.

## Concept and Human Perception of Resilience

For our research's hypothesis that is deeply rooted in embracing alternate perspectives and worldviews, a pluralistic outlook is important to reduce vulnerabilities, increase adaptive capacity, and promote cooperation among different stakeholders involved. We find it important to acknowledge that resilience is a complex and multifaceted concept that cannot be easily defined or standardized. The authors of the chapter *Understanding societal resilience*: *The case for engaged scholarship* from the book *Multisystemic Resilience*, suggest approaching "resilience through an open research methodology, such as action research and engaged scholarship" (Anholt et al., 2021). They further add "such approaches take the complexity of societal issues to which resilience is being applied as a starting point and therefore welcomes a pluralist perspective of the problems and realities." We would agree with the authors as this aligns with our call for including various alternate perspectives and worldviews in our research study that may help unpack causes and implications of crises in society that may not be uncovered otherwise.

In reference to engaged scholarship as tool to building resilience, the authors drive our attention towards boosting the engagement between academic and practical expertise. We believe having a realistic understanding of adversity and addressing learning gaps between different sets of groups is necessary and can only be achieved by engaging with people and places outside of the academic and professional settings. This may provide us with practical insights and lived experiences which is key to achieving more resilience. We also find this tool useful because for our research, having stakeholders with a thorough understanding of the crises is the key to creating more awareness and passing accurate information to society. Implementing insights from practical expertise informs and enriches research, while learning from academics exposes us to a range of organizational, methodological, and structural tools that can synthesize and enhance the findings. This aligns with our approach of inviting experts from the field to compare their insights with the insights from the lived experiences of non-expert participants.

Another chapter from the same book, *Adaptive management of ecosystem services for multisystemic resilience iterative feedback between application and theory* (Hogan et al., 2021) (covered in more detail in the following sections), highlights the importance of polycentric governance systems in aiding collective decision making. Based on our interview data, many inputs were directed toward bad decision-making practices that proved to be detrimental during the COVID-19 pandemic. This raised our interest in adapting decision-making practices into our resilience framework to aid decision-making processes during crises. Polycentric governance systems are collections of decision-making bodies that are connected informally (Hogan et al., 2021).

For a system to overcome existential risks, it is necessary to have strategies and tools ready ahead of time to avoid negative consequences resulting from the lack of preparedness. In the context of the recent pandemic, data from our interviews highlighted how lack of preparedness shown by governments worsened the crises. The authors, Anholt et al., express how resilience has "often been coupled with the notion of a culture of preparedness, whereby individuals and communities are expected to be continuously prepared to absorb and address very unlikely—but not impossible—stresses" (2021). Therefore, we have concluded that focus should be drawn towards pushing the government to adopt a culture of preparedness as it may inform their framework of resilience and build a more proactive than reactive approach to addressing existential risks. Rather than having the "wait until it happens" mentality, governments, individuals, and communities should take steps to prepare for potential risks in advance, reducing the impact of these risks and increasing the likelihood of recovery.

Our approach to building resilience is rooted in promoting efficient decision making in conjunction with practices and policies that address the future existential risks. Perhaps implementing a polycentric governance system can foster cooperation among different levels of government bodies across the system to address existential risks and build resilience in a Canadian context. This strategy can distribute accountability of managing existential risks across different levels of governing system holding them accountable for their actions.

Our response to achieving more resiliency for Canadian society also revolves around breaking the current rising trend towards increasingly extractive practices to fuel economic growth. Extractive practices promote privatization of public resources and services, such as water, healthcare, and education and have also led to exclusion of Indigenous perspectives resulting in the degradation of the environment and

the creation of more wicked problems. The authors elaborate on how efforts to improve resilience have "often been criticized for enabling a neoliberal model for addressing contemporary societal problems" (Anholt et al., 2021). For addressing societal weaknesses leading to risks in contemporary society, models of resilience that enable powerful actors to extract resources and wealth from powerless or marginalized groups have the capacity to perpetuate weaknesses than mitigate them. Practices that ignore the significance of equitable solutions and entrench current power structures threaten to reinforce inequalities and hinder progress towards a more equitable and resilient society. To promote equity in resilience practices, the authors identify four themes: "attention to subjectivities, inclusion, cross-scale interactions, and transformation" (Anholt et al., 2021). Adopting these four themes as a theoretical framework for our research may help identify and address the social, cultural, and political weaknesses that impact resilience outcomes.

## Characteristics of a Resilient System

Our literature review on historical societal collapse reflects how certain societies in the past collapsed due to perpetuating vulnerabilities in the system. We found it important to understand the characteristics a system should possess to withstand changes during crises. Identifying and understanding vulnerabilities or disturbances in the system that are acting as drivers is key to building a resilient system. In the chapter on *Adaptive management of ecosystem services for multisystemic resilience iterative feedback between application and theory*, the authors state "If managers have an understanding of the specific types of disturbances, they are likely to face, they may be able to put in place targeted measures to increase the system's resilience to these disturbances" (Hogan et al., 2021). In the context of existential risks, policymakers, managers, and researchers should be aware of disturbances to improve their decision making and response to such disturbances. For example, if water scarcity is a problem, associated risks can be mitigated by analyzing systemic disturbances and providing substantial information about reducing stress on water resources or promoting water management practices. To address identified disturbances, the authors identify seven principles as key to building the resilience: "maintaining diversity and redundancy, managing connectivity, managing slow variables and feedbacks, fostering complex adaptive systems thinking, encouraging learning, broadening participation, and promoting polycentric governance systems." (Hogan et al., 2021).

From the insights gained from our scenario research, we learned that a critical

response to existential risks lies in analyzing the impacts (positive or negative) of a complex system on their neighboring or inter/intra-connected systems. The authors describe how managing systems effectively requires an understanding of the internal and external dynamics and resilience building capacity of different components of the system. As a result, resilience in complex systems is inherently multisystemic in nature. For example, in the context of our research study, a loss of ecosystem resilience can lead to rapid shifts or volatility in the system affecting its outputs, such as crop production. However, a resilient system that comprehends resilience building capacity of its different components may have the capacity to cope with rapid shifts through increased resilience of these components. Therefore, when the authors states that "resilience of a system state is not inherently desirable" (Hogan et al., 2021) it possibly implies that there can be a balance between different interconnected systems by bringing systems in an undesirable state back to their desirable state by increasing resilience of other components. Thus, by acknowledging the complexity and interdependence of the risks in complex systems, a mindful approach to resilience can help address potential vulnerabilities. These risks are uncertain, prolonged, complex, and interdependent, meaning that they are difficult to predict and require a multifaceted approach to address.

### Adaptive Management Tool

For our research study, we explored tools that have been employed to build more resilience for a society. The authors describe the application of the Adaptive Management (AM) framework shown in Figure 3.22 to aid potential management actions in better supporting resilience of a system facing change. They argue that application of AM enables the exploration of "system resilience and dynamics while continuing to address management objectives by using purposeful experiments that improve learning and lessen uncertainty over time" (Hogan et al., 2021). AM might thus be a useful tool for our research study as it provides a flexible and iterative approach to decision making that can better respond to complex and uncertain situations. This approach to resilience involves constant monitoring, evaluating, and adjusting strategies based on changes in the system, allowing society to adapt and evolve in response to changing circumstances.

The authors state that Adaptive Management "explicitly assumes incomplete knowledge and the inevitability of uncertainty and follows decision with action by increasing knowledge of the system under management, thereby also decreasing uncertainty in future management actions" (Hogan et al., 2021). In the context of our

research, employing the Adaptive Management tool can enable us to recognize and address uncertainties and knowledge gaps in the management of complex systems. This may help decision-makers to improve their ability to anticipate and provide a critical respond to potential threats and risks. It helps to build more robust and adaptive systems that are better able to withstand the challenges posed by existential risks in the future.

Global existential risks resulting from environmental degradation such as climate change, water scarcity and food insecurity have repeatedly appeared during our primary research process. These risks have high uncertainty. "Adaptive Management has been considered a silver bullet solution for any and all natural resource issues, when, in fact, it is only effective when applied at certain scales across space and time and depends on stakeholders, researchers, and managers all being able to agree on a common vision and principles for guiding the iterative "learning by doing" process" (Hogan et al., 2021). Additionally, authors emphasize that this tool is best to apply in situations where uncertainty and controllability factors are both reasonably high. Incorporating this framework sounds promising for our research as it may yield significant learning, increase predictive capacity, and enhance decision making.

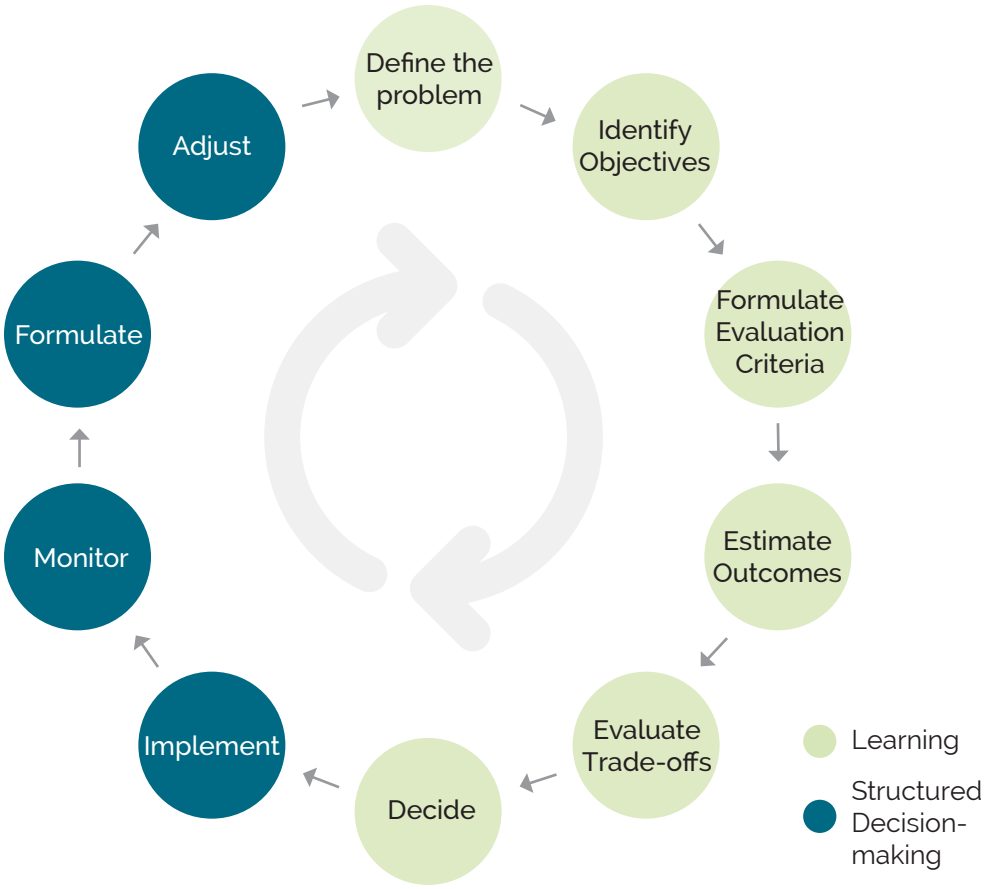



*Figure 3.22 Adaptive Management process diagram*

## Conclusion

From Diamond, we learned that sometimes a nation's ability to cope and address adversity comes from acknowledging that previous coping mechanisms were no longer fruitful and new mechanisms were needed to resolve future conflicts. His study of six modern nations informs how our framework for resilience should integrate these 12 factors (listed on pg. 72-3 of this section) to uncover factors that might help or hinder Canada's resilience. While we take into account these factors, there is also a need to build strategies that can compensate for these factors. Understanding a nation's core values, historical experience with previous crises, and national identity might prove vital in addressing a nation's future crises. Another key takeaway from this framework is that Canada's past failures may provide valuable insights into building future resilience.

From *Multisystemic Resilience: Adaptation and transformation in the contexts of change*, we have learned that the process of building resilience is non-linear and dynamic in nature. One critical dimension for achieving more resilience is to deal with conflicts and trade-offs among individuals and involved stakeholders, whose opinions and challenges vary in the face of uncertainty. Fostering interdisciplinary culture, values, and beliefs is a strategic way to bring together various stakeholders to share their experiences and knowledge. This also helps in uncovering complex systemic issues leading to crises and better inform strategies and action plans. Integrating methods such as engaged scholarship also help bring myriad views and perspectives into the picture.

We believe that society needs to be informed and educated in the face of crises to create more awareness about their own security and safety first. Our approach to resilience should be embedded in practices and strategies that promote effective decision making and encourage government bodies and individuals to take pro-active actions in face of crises. Thus, involving stakeholders that have prior experience in the field and are aware of crises should be at the forefront of strategic planning and decision-making processes.

Tools such as Adaptive Management enable building resilience models through an iterative process and articulating new strategies if and when new uncertainties emerge during crises. This tool is informed by researchers, practitioners, and stakeholders that can frame hypotheses, test prototype

models, manage actions, and reduce uncertainty over time. In the wake of the COVID-19 pandemic, these lessons inform how building resilience without government bodies adopting a culture of preparedness can lead to reactive actions that may not be best suited for all. The resilience of a system can only be strengthened if both governments and individuals can take accountability for their own actions. This means that governance and management systems must be flexible and adaptive to respond to new information.

### 3.2.4 Alternate Worldviews

Worldviews come from personal life experiences and can be influenced by deeper values based on upbringing, religious or cultural principles, and societal behaviours and norms. Worldviews are very personal and can vary greatly from person to person, however there are patterns that can be derived from these worldviews and inferred as a collective societal worldview that hold generally true for a specific demographic of people. Demographic groups that hold these shared worldviews could be defined by a similar age, culture, nationality, political ideology or some other defining quality. Worldviews held by an individual can change or shift over time as new influences may cause a shift in perspective.

> *Worldview is a concept 'whose time has come,' and its increasing appearance in the contemporary climate change and global sustainability debates can be understood as both response to, and reflection of, the challenges of our time and the solutions they demand (Topa and Narvaez, 2022).*

One common way worldviews are delineated are Western and Eastern worldviews. The cultures that are associated with Western or Eastern worldviews can shift over time. Present day countries associated with a Western worldview include Canada, the U.S., countries within Western Europe, and Australia; there are other countries that aspire to Western ideals. Western worldviews are closely tied to the spread of Christianity and colonization by Europeans.

Eastern worldviews are typically associated with regions such as East Asia (China, Japan, and surrounding countries), Southeast Asia (Indonesia, Philippines, and surrounding countries), and South Asia (India, Pakistan, and surrounding countries). Eastern worldviews are associated with many religions as well as a rich tapestry of diverse cultures that exist in the East.

It is important when framing a worldview to understand what fits within that perspective and what is left out. For example, from the Indigenous perspective "[...] the worldview that considers Nature as intelligent and living and the worldview that perceives Nature otherwise are the only two essential worldviews" (Topa and Narvaez, 2022). But from our perspective as researchers, there are many more worldviews than just two. As mentioned in the introduction of this focus area, The Center for Global Awareness introduces five main worldviews: Indigenous, Traditional (political conservatives, populist right, alt right, and religious fundamentalists), Progressive (liberal/progressive left), Globalized, and Transformative (Aimes, n.d.). This list isn't exhaustive but encompasses the dominant contemporary worldviews you might find in a country such as Canada.

We are interested in examining these contemporary worldviews and how they may approach overcoming existential risks. In *The Dawn of Everything* (2021), the authors Graeber and Wengrow talk about how contemporary worldviews try to rationalize the existence of inequality in the form of a mythical narrative. (Recall that myth is the deepest layer of the Causal Layered Analysis explained in the Methodology section, directly underneath the worldview layer.) The authors present the three most common myths:

- Putting Out Fires: "the best we humans can hope for is some modest tinkering with our inherently squalid condition—and hopefully, dramatic action to prevent any looming, absolute disaster"
- Progress for Progress's Sake: "The only other theory on offer today has been to assume that there were no origins of inequality, because humans are naturally somewhat thuggish creatures and our beginnings were a miserable, violent affair; in which case 'progress' or 'civilization'—driven forward, largely, by our own selfish and competitive nature—was itself redemptive. This view is extremely popular among billionaires but holds little appeal to anyone else, including scientists, who are keenly aware that it isn't in accord with the facts."
- Rose-Coloured Glasses: "The most rosy, optimistic narrative—whereby the progress of Western civilization inevitably makes everyone happier, wealthier and more secure—has at least one obvious disadvantage. It fails to explain why that civilization did not simply spread of its own accord; that is, why

> European powers should have been obliged to spend the last 500 or so years aiming guns at people's heads in order to force them to adopt it."

For our research, we have named them with catchy titles—Putting Out Fires, Progress for Progress's Sake, Rose-Coloured Glasses—for the ease of referring to them as well as to encapsulate the sentiment of each in an easy to recall phrase. When we look at these three myths, they are also the three most common reactions in contemporary worldviews to existential risks. Putting Out Fires represents a reactionary, crisis mitigation mindset. Progress for Progress's Sake is reflected in the continued over-extraction of resources from the Earth, consumerism, and "technology will save us" mindsets. Rose-Coloured Glasses encompass climate deniers, mental compartmentalizers (people who believe climate change but choose to ignore it), and climate-doomers (people who are paralyzed into inaction or believe action is hopeless).

These myths are useful for identifying common pitfalls of certain mindsets but are not particularly helpful or hopeful in creating resilience. We have turned to an examination of Indigenous worldviews to understand how they may be more supportive of resiliency. In the book *Restoring the Kinship Worldview*, Topa and Narvaez offer an overview of "the common precepts shared by Indigenous peoples across the global landscape. As vital as place-based knowledge is, this book is designed to help those with a Eurocentric mindset to begin the journey toward a kincentric relationship with the earth, starting with the larger worldview that diverse Indigenous cultures share" (2022).

From 28 precepts that define a universal place from which all Indigenous worldviews are based on, we have selected 10 that are most relevant to our research:

- Nonhierarchical Society – Wenona Victor Hall (Stó:lō)
- Emphasis on Community Welfare – Doña Enriqueta Contreras (Zapotecan)
- Nonmaterialistic Barter, Gift, and Kinship Economics – Rebecca Adamson (Cherokee)
- All Earth Entities are Sentient – Robin Wall Kimmerer (Citizen Potawatomi Nation)
- Nonanthropocentrism – Terry LeBlanc (Mi'kmaq)
- Mutual Dependence – Jack Forbes (Powhatan-Lenape, Delaware-Lenape)
- Generosity as a Way of Life – Martin Brokenleg (Lakota)
- Conflict Resolution as Return to Community – Wanda D. McCaslin (Métis)

- Laws of Nature as Highest Rules for Living – Winona LaDuke (Ojibwe)
- Responsibility Emphasis – Xiuhtezcatl Martinez (Aztec)

The book uses written passages from a diversity of Indigenous people (their Indigenous nation is noted in brackets in the above list), which the two authors then use as a basis of discussion around that worldview precept. Below, each selected precept is explained in more detail.

**Nonhierarchical Society:** Hierarchy in many contemporary societies exists because of one group's ability to oppress and control another: "Colonial ideologies such as eurocentrism, racism, oppression and hegemonic control are used to promote and sustain a colonial regime that denies equally the colonized and the colonizers of their full human potential" (Topa and Narvaez, 2022). In contrast, Indigenous communities often have a system of hierarchy based on respect. Indigenous collectivistic cultures are often misunderstood to lack individual autonomy, self-sufficiency, uniqueness, and independence; however, these traits are valued for how they contribute to the well-being of the group. The problem with hierarchy is "how colonized hierarchical perspectives assert authority without consent" (Topa and Narvaez, 2022).

**Emphasis on Community Welfare:** The thread of respect is continued in this precept. "The mutual respect that is found at the heart of the family has made our communities 'united' communities" (Contreras, 2009). By extension, this respect allows us to realize we depend on one another on many levels—at the level of the family, the community, the city, the region, and in the global community as well. The authors speak about land-based knowledge as a way of rebuilding divided communities and how community welfare goes beyond caring for our fellow humans to include "concern for the well-being of the local ecology—comprising animals, native plants, waterways, forests, and more" (Topa and Narvaez, 2022). Within this section Topa (Four Arrows) shares the principles of true listening to centre community welfare: "(1) remembering the ultimate, longer-term importance of our decisions and actions; (2) never forgetting our interconnectedness with all; (3) appreciating the nature of feelings and how they often relate to forgetting to accept the unknown; (4) holding on to authentic humility; and (5) remembering who we really are, with great appreciation for those who came before us who did similar work or who have made our work somewhat easier or clearer."

**Nonmaterialistic Barter, Gift, and Kinship Economics:** Recognizing our

interconnectedness is required to shift our economic perspective from the lens of a Western worldview to an Indigenous worldview. "What made traditional economies so radically different and so very fundamentally dangerous to western economies were the traditional principles of prosperity of creation versus scarcity of resources, of sharing and distribution versus accumulation and greed, of kinship usage rights versus individual exclusive ownership rights, and of sustainability versus growth" (Topa and Narvaez, 2022). Prosperity of creation, sharing and distribution, and kinship usage rights are a very different way of valuing natural resources and our access to them. For example, "because the Northern Cheyenne understand the environment to be a living being, they have opposed coal strip mining on their reservation because it kills the water beings. There are no cost measurements of pollution, production, or other elements that can capture this kind of impact" (Topa and Narvaez, 2022). The argument here is that Western economics are not value-neutral because "patriarchal capitalism parasitically relies on free gifts (e.g., Indigenous lands, natural "resources," laborer work, "housewife" work) to transform them into capital, turning gifts into forms of artificial exchange" (Vaughan, 2007). Money exchanged for goods adds nothing to the social fabric, whereas the gift economy relies on human and other-than-human interconnectedness and builds social capital.

**All Earth Entities are Sentient:** We have seen this precept interwoven into the others with the way that Indigenous people relate to and perceive non-human beings, such as the water beings, and is closely tied to the previous precept of the gift economy. "To keep us enchanted with the status quo, the dominant economic system and modern economics have to "externalize" (not take into count) effects on the natural world or on the health of individuals and communities" (Topa and Narvaez, 2022). The dominant contemporary worldviews and the systems that support it are rife with "externalities." Consider industrial agriculture and the numerous harms it inflicts on animals and the environment. The Dish With One Spoon Treaty[1] and the Honorable Harvest[2] that Kimmerer calls upon presents another way of relating to our environment. "This whole way of being with plants (and all the other nonhumans) is so contrary to Western culture," but "by paying homage to everything that sustains us and keeps us healthy, the prayer reminds us how important it is to take care of them" (Topa and Narvaez, 2022).

1. Kimmerer shares the Potawatomi version of the metaphor, The Dish With One Spoon, which is about sharing the gifts of Mother Earth: the land is represented by a dish that Mother Earth has filled and that must be shared and eaten from with one spoon.

2. The Honorable Harvest is a set of Potawatomi principles that reflect sustainability as a means of consuming the resources of the earth in such a way that it does not impair the ability of the earth to provide those same resources to future generations.

The Indigenous perspective is showing us "how to understand the world as a gift" (Topa and Narvaez, 2022).

**Nonanthropocentrism:** In the dominant Western worldview, it is understood and taken for granted that the Earth and its resources exist to serve human needs. In contrast, this precept turns the idea that people, governments and corporations can own land and natural resources on its head: "In essence, humans belong to the land, not vice versa" (Topa and Narvaez, 2022). This belief goes hand in hand with the previous precept. If one recognizes other-than-human beings as sentient, then it is much easier to understand that all of Earth's beings are equally valued and humans are not of central importance. In terms of enacting this precept, consider this, "our first instinct when we meet a spider or a dandelion should be a greeting, not getting them out of our way" (Topa and Narvaez, 2022).

**Mutual Dependence:** The theme of interconnectedness has been brought up in several other precepts and is relevant to mutual dependence as well. To illustrate this dependence, Forbes (2008) explains:

> *I can lose my hands, and still live. I can lose my legs and still live. I can lose my eyes and still live. I can lose my hair, eyebrows, nose, arms and many other things and still live. But if I lose the air I die. If I lose the sun I die. If I lose the earth I die. If I lose the water I die. If I lose the plants and animals I die. All of these things are more a part of me, more essential to my every breath, than is my so-called body.*

Yet the way in which we care for and value things like clean air to breathe, clean water to drink, animals and plants to eat, and an earth to sustain all those things is not reciprocal to how important they are to our survival. Forbes has a very succinct and poetic way to summarize mutual dependence, "That which the tree exhales, I inhale. That which I exhale, the trees inhale. Together we form a circle" (2008).

**Generosity as a Way of Life:** Nonmaterialistic gift economies are closely related to this precept. "In many tribal cultures, giving away possessions is part of an entire way of life—one that creates powerful social bonds" (Topa and Narvaez, 2022). However, capitalism promotes mindsets of scarcity and greed thereby undercutting generosity

and abundance mindsets required for the nonmaterialistic behaviours of gift giving to build social resilience. Generosity as an Indigenous precept extends beyond material things, "To be patient, to listen, to share a smile, a joke or even a tear are powerful gifts. An apology to one we have offended can be a form of generosity, because it puts one in a position of humility. Even more powerful is the generosity of forgiveness extended to those who have hurt us." (Brokenleg, 1999; Brendtro, Brokenleg, Van Bockern, 2019). Generosity enacted in this way also fosters empathy.

**Conflict Resolution as Return to Community:** This precept merges forgiveness as a form of generosity with the idea of mutual dependence as ways to strengthen community welfare. This is because "Indigenous people tend to interpret hurtful actions less individualistically and more as signs of imbalances within the community as a whole—imbalances that affect everyone. In this sense, offenders help the community by drawing attention to imbalances. Their actions tell us that the essential fabric of the community is starting to unravel and needs mending" (McCaslin, 2005). This process of restorative justice is rooted in Indigenous worldviews and is a beautifully constructive way of using conflict to enhance community resilience. The authors ask a poignant question that is very relevant to our research: "in light of our existential global situation, with climate change, pandemics, extinction rates, pollution, and violence, what kinds of conflict resolution can occur throughout the world to start bringing us back into community after we suffer through the sixth mass extinction?" (Topa and Narvaez, 2022). The authors suggest ways to build capacity for cooperation, such as self-calming, social joy, expanding communal imagination, and nonviolent communication. At the root of this precept is understanding the shared responsibility for harms caused but also for healing (Topa and Narvaez, 2022).

**Laws of Nature as Highest Rules for Living:** This precept relates back to the concept of our mutual dependence and oneness with nature. "You can change the terms, you can change the allowable limits, you can do the risk assessment—all these things—but in the end, the fact is that you and I drink that water. You and I breathe that air. You and I live here" (LaDuke, 1999). This implies that natural law supersedes municipal, provincial, or national law (Topa and Narvaez, 2022). Human forms of government may permit resource extraction and pollution, but it is our interconnectedness that should and will (perhaps harshly) ultimately govern the natural limits of these resources. The Indigenous worldview is increasingly being included as a vital consideration to rebalance life systems by credible sources and organizations such as the 2019 United Nations Global Assessment Report on

Biodiversity and Ecosystem Services (Topa and Narvaez, 2022).

**Responsibility Emphasis:** Responsibility for harm as well as resolution and healing are key to community welfare, and we would add it to other levels of societal wellbeing as well. However, "the dominant worldview has overemphasized rights and underemphasized responsibility" (Topa and Narvaez, 2022) and in this way, responsibility has been removed from the aggressor if they were acting within their rights, regardless of whether they perpetrated harm. The Indigenous worldview sees responsibility and rights as intertwined: "We have a right to a place to live, but that right bestows upon us responsibilities to care for the land and the other inhabitants of the land. To have a right to the land is to also have a responsibility to the land, and to renege upon our responsibilities to the land is to lose our right to the land" (Luke Barnesmoore in communication with Four Arrows, 2020; Topa and Narvaez, 2022). The authors bring questions around moral and ethical judgement to this discussion on responsibility, citing Lawrence Kohlberg's stages of development, whereby (from a Western worldview) very few people make "self-chosen moral decisions regardless of laws or social pressures" (Topa and Narvaez, 2022). This also helps explain why the Western worldview promotes defaulting to codified laws and rejection of unwritten natural laws, as related to the previous precept. Responsibility of this kind relies on moral judgement and ethical sensitivity, to which the authors suggest also requires:

> *Receptivity to the communications of the other-than-human, respecting diversity, and controlling bias towards human superiority. Ethical judgment includes honoring the laws of nature and aiming for the flourishing of all. Ethical motivation includes following the principles of the honorable harvest and cultivating a Common self-consciousness (oneness). Ethical action skills include cultivating fearlessness and working hard at self-development (Topa and Narvaez, 2022).*

These skills require an awareness of how and when to apply them, which is taught along with the skills "through observation and practice that Indigenous peoples traditionally supplied to children" (Topa and Narvaez, 2022).

## Conclusion

> *"Indigenous worldview" does not belong to a race or group of people, but Indigenous cultures who still hold on to their traditional place-based knowledge are the wisdom keepers of this original Nature-based worldview. All people are indigenous to Earth and have the right and the responsibility to practice and teach the Indigenous worldview precepts. All have the responsibility to support Indigenous sovereignty, dignity and use of traditional lands. For non-Indians who are concerned about misappropriation, see the peer-reviewed article, "The Indigenization Controversy: For Whom By Whom," (Topa and Narvaez, 2022).*

Through these precepts, we have come to understand some fundamental values and beliefs that inform an Indigenous worldview. This overview is incomplete because we have only selected the precepts most relevant to our research. The three ways that Indigenous worldviews differ from dominant Western worldviews for the purposes of our inquiry are how they relate to nature, how they relate to other humans, and how they view material goods.

We have learned that by recognizing the sentience of other-than-human beings, Indigenous people see themselves and all people as part of nature, rather than viewing themselves as masters of nature. Their relationship is reciprocal and interdependent, if they care for nature, nature will care for them. Indigenous people live by the laws of nature which informs their sense of responsibility and morals.

Respect, mutual dependence, and strong social bonds characterize how Indigenous people relate to other people. Leadership in an Indigenous community is commanded by having the respect of others, not by domination or power wielded from wealth. The problems of one are the problems of all, Indigenous people share the responsibility equally for the balance and wellbeing of the community. The community remains resilient because caring for the wellbeing of others in this way fosters strong social ties.

The strong social ties of Indigenous communities reinforce generosity and make sharing material goods with community members a gratifying act. But their generosity and empathy extend to all beings including nature, and in return nature is generous to them, giving them gifts of sustenance.

We believe that these key takeaways can help inform a strategy to build resilience. Let us recall the idea that worldviews, whether held individually or collectively as the dominant worldview, can evolve and change over time. The authors of *Restoring the Kinship Worldview* put this into perspective and introduce one final precept: "More and more people seem to be attributing to human nature traits that have only emerged in the past 1 percent of human history. This is why understanding our original, Indigenous worldview precepts is so important. Thus, another Indigenous worldview precept might include 'the capacity to remember'" (Topa and Narvaez, 2022). As you will see in the following section, this capacity to remember and to take the long view is vitally important to resilience in the face of existential risks. It is not an ultimatum we offer, but rather we ask: what can we learn from alternate perspectives and how might we move forward toward a more resilient future for Canada while honouring the diversity of perspectives and worldviews held by Canadians?

# 3.3 Discussion of Research Findings

## 3.3.1 Themes in the Secondary Data

### Refocusing Worldviews

From Wright we understand that "the war on terrorism, just like the war on drugs, are bogus wars: [...] terrorism is a small threat compared with hunger, disease, or climate change. 3000 died in the United States that day[1]; 25,000 die every day in the world from contaminated water alone. [...] terrorism cannot be stopped by addressing symptoms and not the cause. Violence is bred by injustice, poverty, inequality, and other violence" (Wright, 2019). Terrorism is also fueled by Western actors trying to supplant others' worldviews; polarization is causing more political strife and violence. We need a relational way of being where plurality of views can exist and be respected.

From Topa and Navarez we recognize that an Indigenous worldview can bring an alternate perspective where humans are decentralized and care for nature is central, to which humans are only one aspect of nature. From Diamond, Wright, and Tainter we understand that the biggest common factor between various societies that collapse is environmental degradation and humans' inability to adequately manage it. Humans need to take their role as stewards of the land, sky and water more seriously. If we take care of these natural resources and beings, they in turn will care for us. Reframing natural resources as living beings is important because it's hard to imagine inanimate objects providing care to us humans. However, this reframing of natural resources to address environmental degradation and climate change will always be hard in a world where injustice, poverty, and inequality exist. Despite the importance of addressing global existential risks such as climate change, countries where large portions of the population are struggling with day-to-day survival will find it hard to prioritize long term risks.

1. Wright is referring to the 9/11 attack on the World Trade Towers in New York City in 2001

## Energy Continuum

From the analysis of energy scenarios, we understand that risks such as energy insecurity resulting from increasing energy prices have the potential to widen the wealth inequality gap, both globally and in Canada, and pose significant challenges to achieving future equality if not addressed. The risks associated with energy infrastructure disproportionately affect remote and vulnerable communities in Canada, but ultimately affect everyone. For example, brown outs and black outs can affect whole portions of the energy grid, but power is likely to be restored to remote communities last and vulnerable communities may lack the resources (such as expensive generators) to withstand prolonged outages. Additionally, until suitable fuel alternatives are adopted, Canada's reliance on fossil fuels for personal motor vehicles, road freight, aviation, and shipping transport can pose a threat to energy security and contribute to greenhouse gas emissions. The lack of political will to adopt progressive energy policies[2] can hinder Canada's ability to meet its net-zero promises and aid the transition to a new energy economy.

Similarly, from Tainter we have learned that societies possess an inherent inclination towards increasing complexity. This often leads to a decline in the marginal productivity of such complexity. In this context, Tainter implies we should consider expanding the energy sector through territorial expansion that provides alternative sources of energy or resources. While new energy resources are needed at least in the short term, most present-day recommendations focus on technological solutions, i.e. clean energy transitions (see definition in glossary), and strategies to reduce demand in the long term (explored further in Section 3.2.2). Territorial expansion to acquire new energy subsidies is a Western colonial approach to solving resource shortages, of which the negative side effects are many (and are discussed throughout this research). Therefore, non-colonial approaches to addressing existential risks inform our strategy for resilience, and socioeconomic growth fueled by extractive and colonial practices should be questioned. This leads us to conclude that challenges posed by energy insecurity can be addressed in part by creating new subsidies for clean energy and removing subsidies for fossil fuels. All these strategies can reduce the pressure on the existing system by reducing reliance, supplementing, or replacing the resources that have become scarce or inefficient due to the growing complexity of society.

2. British Columbia has banned the sale of combustion engine cars by 2040, which is a step in the right direction towards adopting progressive energy policies (Statt, 2019)

## Unpacking Collapse

From Tainter we understand that as societies grow in size they also grow in complexity. Because of diminishing returns and using up the most available resources first, as societies grow it becomes more difficult to supply that civilization with new energy inputs and resources. Wright says something similar; from him we understand that civilizations only thrive while they are growing and are most unstable when they have expended their natural resources. This leads us to the conclusion that civilizations follow a natural growth or boom cycle followed by a period of decline and continue to oscillate between the two over time unless the decline is too sudden or sustained that there is no recovery. There also seems to be a correlation between growth and decline, the sharper the growth spike, the sharper the decline, and the increased likelihood of no recovery.

How then do we lessen this growth period to reduce the severity of the fall? Ultimately lessening sharp growth is about lessening unchecked and unsustainable population growth. From historical examples, we know that intensifying agricultural practices can lead to unsustainable population growth and ultimately collapse. From our scenario research presented in Section 3.2.2, we have learned that food production is closely tied with water and energy, and a failure in either will have deep impacts on the food supply chain.

Should we be worried about unsustainable population growth? As countries develop and equality between men and women improves (when and women gain education, rights, and access to contraception), population growth tends to plateau. Canada's population continues to grow mainly because of immigration (*Canada's Population Estimates*, 2023), and the UN projects that world population to plateau around 11 billion in 2100 (Cilluffo and Ruiz, 2019).

In a world where we produce enough food to feed everyone, why do people still die of starvation? The problem of world hunger is a candle burning at both ends: 1) in areas of extreme poverty people are at highest risk of starvation, 2) environmental degradation and climate change threaten to reduce the production of food in a world where global population continues to grow, at least until the end of this century. The first is a problem of the here and now, the second is a looming problem that may worsen in the future.

To address the here and now, extreme poverty is a symptom of global injustice,

inequality, and geopolitical conflict. There is a thriving body of research on topics of degrowth and circular economies that focus on decoupling prosperity and production from resource extraction. Similarly, from Topas and Narvaez we understand that Indigenous worldviews offer nonmaterialistic economies where material value is replaced with social capital. Perhaps these strategies of recalibrating value in economies will serve to lessen inequality.

## 3.3.2 Comparison of Primary and Secondary Data Insights

### Resilience Framework

Diamond has provided us with a framework for assessing a nation's or country's ability to overcome crises, or reframed, to assess resilience. We have seen in Section 3.2.3 how Diamond has used this framework to assess examples of crises that various nations have faced in the past and what key factors allowed them to prevail. Diamond summarizes his book with a contemporary evaluation of how he views the U.S. in relation to his resilience framework. We also saw an opportunity to apply his framework to Canada. Below is a chart comparing factors of resilience for Canada and the U.S. We have used Diamond's evaluation of the U.S. as a starting point to fill out the corresponding column in the table below and modified it to make it more encompassing. We have used a combination of our participant responses with our own lived experience supported by data to fill out the table on various resilience factors for Canada. Because of the similarities between the geography and culture of Canada in the U.S., it is interesting to view them comparatively.

Comparative resilience factors for the U.S. and Canada:

| | U.S. | Canada |
|---|---|---|
| National consensus that one's nation is in crisis | Perhaps only once powerful rich Americans being to feel physically unsafe (Diamond, 2005). In the fourth quarter of 2022, 68% of the total wealth in the United States was owned by the top 10% of earners. In comparison, the lowest 50% of earners only owned 3% of the total wealth (*U.S. Wealth Distribution 2022*, 2023). | Canada has many billionaires and a similar equality divide as the U.S.: The top 20% wealthiest households held more than 67% of all net worth in Canada, while the bottom 40% held 3% (*Statistics Canada*, 2022). |

| | | |
|---|---|---|
| Acceptance of national responsibility to do something | Affluent Americans work to protect themselves rather than to fix their country (Diamond, 2005). Beyond blaming the rich, the Western myth of the "Self-Made Man" and individualistic behaviours that support it (see discussion in Section 3.2.1) inhibit collaborative approaches to solving problems. | Canada shares cultural ethos of the "Self-Made Man" with the U.S. Lack of collaborative values was expressed in our interviews, as well Canadian government tempered action because of marginally better indicators than the U.S. on major social/ environmental issues. |
| Delineating the national problems needing to be solved | Americans believe that the biggest problems are high cost of living/inflation, the economy in general, the government/poor leadership, and immigration. Only 1-3% of Americans believe that climate change, racism, poverty/ houselessness, wealth inequality are the biggest problems (*Most Important Problem*, 2023). | Before COVID-19, economy/ unemployment and climate change tied as Canadians top concerns. As recently as 2022, economy/unemployment has remained second to pandemic, but other top concerns have shifted to healthcare, cost of living/inflation, poverty/ inequality, fear of war, and poor government leadership (*Most Important Problem Facing Canadians Today, 2022; Inflation, Economy Outrank COVID as Top Issues for Canadians*, 2022) |
| Getting material and financial help from other nations [as well as intelligence, military, economic support] | U.S. commands a lot of support because of their power, especially militarily, as well as being a member of international organizations such as NATO, USMCA, G20, G7, OECD, Five Eyes etc. U.S.'s tech industry has attracted top global talent. | Canada enjoys the protective umbrella of being the U.S.'s neighbour, which sometimes causes us to rely too heavily on implied support (e.g. defending the Arctic). Canada is a member of many of the same international organizations as the U.S. such as NATO, USMCA, G20, G7, OECD, Five Eyes etc. Because of milder political views (on immigrants, abortion, gun control) and for other reasons (affordable tuition) Canada is drawing top talent away from U.S. (*The Brain Drain That Is Killing America's Economy*, 2022). |
| Using other nations as models of how to solve the problems | Belief in American "exceptionalism" blocks their ability to learn from other nations (Diamond, 2005). | Canada had adopted national health plans and education systems from European models. |

| | | |
|---|---|---|
| Strong national identity | Strong sense of national identity: strong, powerful, proud, "can-do" (Diamond, 2005). | Because of cultural similarities, many nations lump us in with the U.S., including the U.S., however we are also known as peacemakers and for our multiculturalism that allows us to have Canadian and other identities with little conflict. |
| Honest national self-appraisal | Delusions: no agreement of what the problem is (political polarization), barriers to democracy in practice, rampant racial discrimination, declining socio-economic mobility, declining government investment in education and public services. Scapegoats: China, Russia, Mexico, illegal immigrants (Diamond, 2005). | From our interviews, we heard how many Canadians were surprised by controversy over mask and vaccination mandates during COVID. There is a national belief that we are already the country we want to be, but there is also a realistic appraisal of our challenges. |
| Historical experience of previous national crises [and relative success dealing with those crises] | Some of the most recent crises the U.S. has experienced are the 9/11 attacks and the COVID-19 pandemic—the U.S. is the country with the second highest recorded mortality rate from COVID-19 (*Mortality Analyses*, 2023). The U.S. it has not successfully been invaded in recent history or experienced direct impacts of war since the Civil War that ended in 1865. The U.S. failed to achieve independence and to abolish slavery peacefully (i.e. the American Revolution and Civil War). | Similar to the US, we are protected by our large water borders and only neighbour one other peaceful country, the U.S. Canada peacefully gained its independence from Britain. Many enslaved people escaped to Canada for freedom after slavery was made illegal. The 2021 BC flood was the most expensive disaster in BC history, yet only 5 people died (*Scientists Link 2021 BC Floods to Human-Induced Climate Change*, 2022). |
| Dealing with national failure | Failure of Vietnam War was hard for the U.S. to tolerate (Diamond, 2005) and more recently, the war in Iraq, and the humbling withdrawal from Afghanistan. | Canada lacks significant experience dealing with national failure. The failed Meech Lake Accord and subsequent Quebec separatist movements could be considered an almost failure to maintain a unified Canada. Sub-par services and living standards in Indigenous communities as well as the Indian Residential School system could be considered failures, but they affect a specific demographic and are not nation-wide |

| | | |
|---|---|---|
| Situation-specific national flexibility | History of flexibility – the U.S. largely had peaceful transitions of political power until the January 6 United States Capitol attack (rise in political polarization and violence and reduced national flexibility). | Mixed success with Indigenous reconciliation – slow to start but Canada is making progress with much work still to be done. Canada has also exhibited flexibility by borrowing European models and with peaceful independence from Britian. |
| National core values | Life, liberty, and the pursuit of happiness, however these values have been used to justify unfettered capitalism. Equality and democracy, however inequality is growing, and the democratic process is heavily criticized as being undemocratic (Diamond, 2005). | Fairness, diversity, equity, inclusion, health, safety, economic security, democracy, and sustainability are all Canadian values (*Reflecting Canadian Values*, 2012). |
| Freedom of action and freedom from geopolitical constraints | Largely free but intercontinental ballistic missiles, economic globalization, ease of uncontrolled immigration reduce the U.S.'s freedom. Entrenched oligopolies in many U.S. industries constrain legislative action and policy options. Unrivaled power projection capabilities due to decades of highest military spending globally. | Largely free but intercontinental ballistic missiles, economic globalization, ease of uncontrolled immigration reduce the U.S.'s freedom. Entrenched oligopolies in many U.S. industries constrain legislative action and policy options. Unrivaled power projection capabilities due to decades of highest military spending globally. |

*Table 2 Comparison of resilience factors of the U.S. and Canada*

One of the biggest differentiating factors for Canada from the U.S. is our policies towards immigration. The Canadian government has encouraged immigration to Canada, in part to address the skilled labour gap but also to compensate for our declining national birth rate. Canada has core values that support tolerance and multi-culturalism; however, discrimination persists against many groups in Canada.

Just like the U.S. who expound virtues of equality and democracy, both countries struggle with issues of political polarization, racism, a growing wealth divide, and inequality, though not necessarily to the same degree.  As seen in the above table, two thirds of the wealth is concentrated with the top 10% in the U.S. compared to the top 20% in Canada. Similar to the January 6 United States Capitol attack in 2021, Canada experienced the convoy protests at Parliament Hill in 2022, both symptoms

of political polarization. The death of George Floyd in the U.S. and similarly in Canada the death of Regis Korchinski-Paquet sparked outrage against police brutality and racism. The U.S. ranks as the richest nation in the world in terms of nominal total GDP (*GDP*, n.d.), but over 10% of the population lives in poverty (Lee, 2023). Although poverty is declining in Canada (*Disaggregated Trends in Poverty from the 2021 Census of Population*, 2022), housing affordability is decreasing (Bico, 2022) and the cost of living is increasing (*Consumer Price Index: Annual Review, 2022*, 2023).

It is easy for Canadians to fall into the trap of overlooking the severity of these issues because it is all too easy for us to point to the U.S. where we perceive these challenges to be more dire (whether they are or not), which affects our lack of honest self-appraisal.

Another way that Canada differs from the U.S. is our reliance on getting help from other countries. The U.S. leads the world in military spending and although they would expect support from other NATO countries in a crisis, the U.S. has always had confidence in their own military capabilities. Like Australia, Canada is a small nation with modest military capabilities of its own and relies heavily on the support of its allies. For Australia, that meant a reliance on Britian's protection, but for Canada, we would look to the U.S. for protection. For example, Canada struggles to defend its Arctic North from other Arctic actors such as Russia and relies on the U.S.'s vested interest in defending it from such threats.

Perhaps Canada's weakest factor of resilience is our lack of a strong national identity. It is not that Canada lacks a national identity; we have a reputation for being a polite and peaceful country, we are passionate about our national sport of hockey, we are welcoming to immigrants (despite our shortcomings, we are still a desirable destination for immigrants), and we are tolerant of other cultures and religious beliefs. But despite all of these defining factors, many nations lump us in with the U.S., including the U.S., because of our cultural similarities. This may be changing as some Americans view Canada as a desirable place to live because of our more tolerant political views. But from a global perspective, we are overshadowed by the power and reputation of our neighbours South of the border, which weakens our independent image and national identity. We differ in important ways from the U.S. that may be overlooked as a result, and it strengthens the cultural osmosis of becoming more like the U.S., perhaps in ways we may want to avoid (i.e., gun control, privatization of healthcare).

### Actual Risk Versus Risk Perception

While designing our process of conducting the interviews (refer to section 2.1.1), we explained how sections of our interview guideline (see Appendix A) focused only on capturing perception of the participants towards existential risks and threats. Participants' experiences during the COVID-19 pandemic also informed how they perceived the Government's response to mitigating the crisis. Comparatively, in the data collected from the interviews we found some similarities and differences with our literature review findings on resilience.

During interviews, participants emphasized how their perceptions towards existential risks were shaped by their recent interaction with the COVID-19 pandemic. Several experts along with non-expert participants observed an alarming level of the Government's short termism leading to lack of preparedness during the recent pandemic. This cycle of short termism may have been fueled by political polarization and power swinging between parties with vastly different governance ideologies. This relates to the literature on *Multisystemic Resilience* where resilience is often coupled with the culture of preparedness and how there is a need to break the "wait until it happens" mentality. This frames our understanding that resilience cannot be seen in isolation without a crisis preparedness plan. In our eyes, a robust resilience model considers many possible emergencies, consequences, action plans, procedures, and available resources, and informs and prepares people for these possibilities.

From our Indigenous participant we learned how they already feel disconnected from the rest of society. In the light of the recent pandemic, many non-expert participants highlighted how impacts of the recent pandemic affected vulnerable and disempowered populations the most. We noted how participants' perceptions towards existential risks were shaped by actions taken by the Government in the face of a crisis. The Governments' lack of effective support for marginalized groups (e.g. people experiencing houselessness and Indigenous communities) hints toward implementation of failed resilience practices during the COVID-19 pandemic that affected people's trust in the governing bodies. However, our expectations of our Government during times of crises may be coloured by our own inexperience of crises. Memory plays a significant role in both the general population's response to crisis measures as well as the Government's strategy towards mitigating the crises (recall the factor regarding historical experience of previous national crises from Tables 2 and 3).

These considerations for crisis preparedness draws our attention back to the learnings from our literature review on *Multisystemic Resilience* where the authors speak about how resilience "has often been criticized for enabling a neoliberal model for addressing contemporary societal problems" (Anholt et al., 2021). We spoke about how these models have the capacity to reinforce inequalities hindering a society's progress. Identifying these similarities between our primary and secondary research data entails how important it is for us to consider this as an area of opportunity that focuses on building a framework that is more equitable and responds to everyone's needs equally.

### Dominant Worldviews and Alternate Worldviews

From the insights on crisis experiences during the interviews, it was observed that these experiences can expose individuals to new ideas, beliefs, and values that they may not have encountered otherwise. Exposure to changing policies, level of transparency in the governing systems, level of awareness regarding crises, and accessibility and availability of resources can influence an individual's trust in the government, which further contributes to that individual's actions during times of crisis.

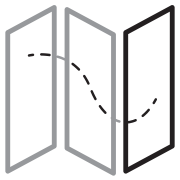
Participants shared how their trust in the government and political system was shaken during the recent pandemic. Our Indigenous participant highlighted the growing distrust between First Nations and healthcare providers, especially the lack of healthcare facilities in remote Indigenous communities. The question arises, how do we work towards rebuilding trust between the Government and Canadian society, especially with Indigenous communities and other vulnerable groups? What can be done to have the Government listen to the needs of Indigenous communities as equally as the needs of others? In the face of adversity, how do we ensure that vulnerable communities are not disproportionately affected by the long-term and short-term impacts of government actions and policy implementation?

From Topa and Narvaez we understand that "colonial ideologies such as eurocentrism, racism, oppression and hegemonic control are used to promote and sustain a colonial regime that denies equally the colonized and the colonizers of their full human potential" (2022). Indigenous communities often have a system of hierarchy based on respect. While humans naturally revert to power hierarchies in times of crisis (e.g. political leadership declaring a state of emergency), people's

lack of trust in government bodies often stems from government introducing resilience models rooted in colonial and capitalist ideologies that allow the upper-class population to rule over the middle- and lower-class population therefore, causing vulnerable populations to suffer the most. For the Government to equally address the needs of all without having an oppressive lens we could borrow Topa's suggestion of principles of true listening to centre community welfare: "(1) remembering the ultimate, longer-term importance of our decisions and actions; (2) never forgetting our interconnectedness with all; (3) appreciating the nature of feelings and how they often relate to forgetting to accept the unknown; (4) holding on to authentic humility; and (5) remembering who we really are, with great appreciation for those who came before us who did similar work or who have made our work somewhat easier or clearer."

# 4.0

# Frameworks for Resilience



# 4.1 Areas of Opportunity

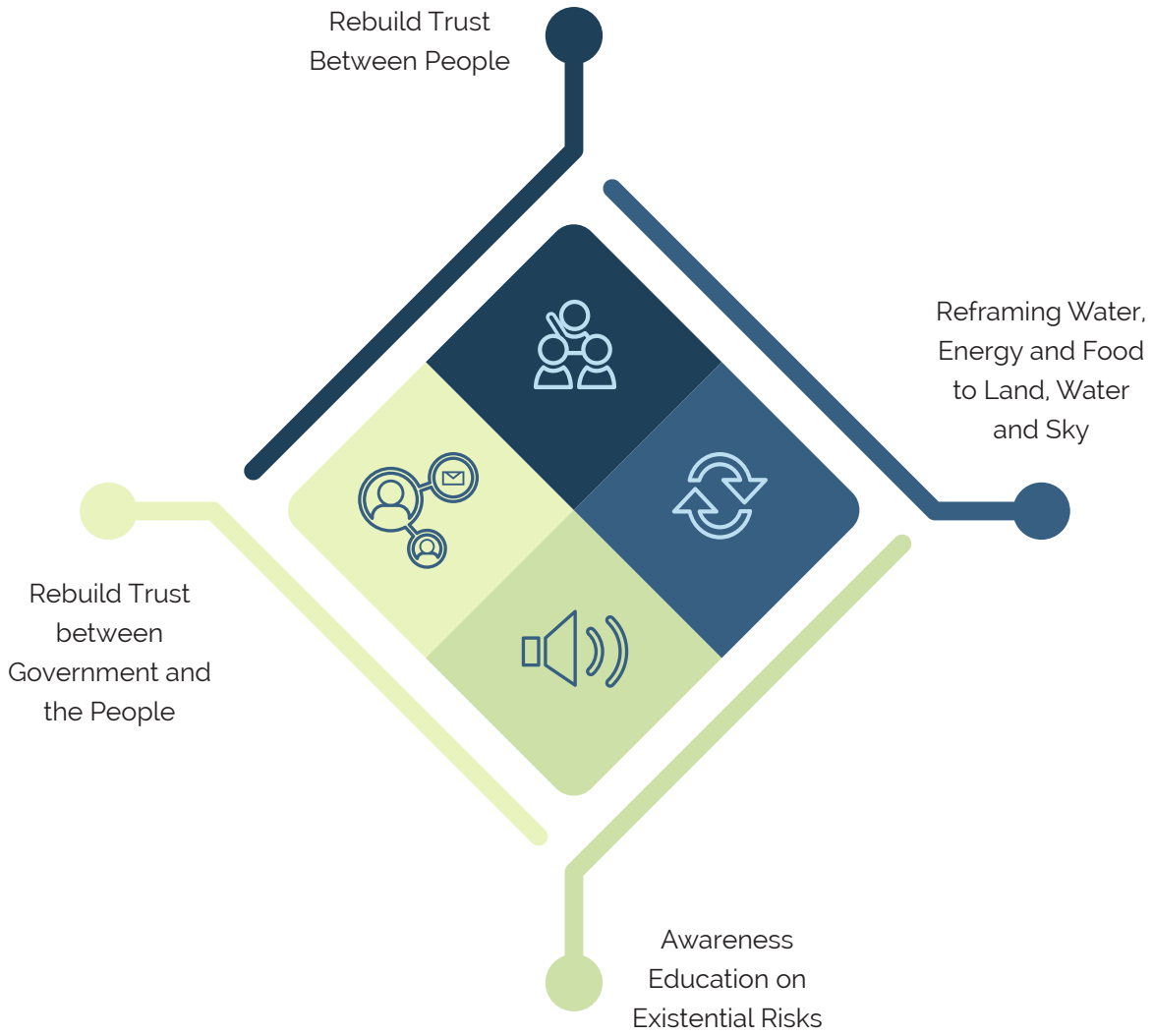



*Figure 4.1 Four areas of opportunity*

While deriving our recommendations for the identified areas of opportunity, we sought to find ways to reverse the metaphors that we derived from our primary research.

### 4.1.1 Rebuild Trust between Government and the People

#### Political CLA metaphor – Lost faith in politics

For several reasons, trust has been eroded over time between the Government and the people of Canada. Specifically, short-sightedness, politics being controlled by money, ineffective attempts at reconciliation with Indigenous people of Canada, and politics that perpetuate systemic inequality have all contributed to the erosion of trust in Canada's political system. A number of participants from our study spoke about this in relation to internal threats (as a potential source of breakdown) or as a barrier to building resilience. Our solution focuses largely on reconciliation with Indigenous peoples of Canada, as it could be a symbolic and meaningful act for the Government to continue to rebuild trust with the population to which it has inflicted the most harm.

One example of how to rebuild trust is the process Germany underwent of reconciliation with nations that were victims of German wartime atrocities. Over many decades, Germany had to reconcile with its Nazi past, beginning with the Nuremburg trials, in which the Allies prosecuted the top-ranking Nazi leaders (1945-1946). However, prosecutions led by Allies didn't succeed in forcing Germans to take responsibility for German actions. It wasn't until 1958 when more widespread prosecutions by the German Jewish lawyer Fritz Bauer took place, nearly a decade after the Nuremburg trials, that Germans began to take responsibility for their actions. The Frankfurt Auschwitz trials were an important step of breaking down the common German defence that they were just following the laws of the time. Those trials also exposed the beliefs and deeds of those who were considered "normal German people" such as German soldiers that were not part of fanatical groups such as the SS. In 1970, West Germany's chancellor Willy Brandt adopted foreign policy that acknowledged the loss of German territories to Poland, which was another step towards reconciling with the impacts of the war. But most memorably, in what is described as an act that was "unplanned, sincere, and deeply meant" (Diamond, 2005) Brandt knelt at the site of the Warsaw Ghetto, "acknowledged the millions of victims of the Nazis, and asked for forgiveness for Hitler's dictatorship and World War Two" (Diamond, 2005). It wouldn't be until 1990 that Germany would be able to unify East and West Germany and remain a part of NATO. Driven by the collapse of

the Soviet Union and the release of countries under its influence, both East and West Germany had strong national identities and reasons for unifying (West Germany wanted to gain control of territory, resources, and assets of East Germany, and East Germany aspired to share in the economic wealth of West Germany).

Another example of rebuilding trust comes from South Africa and its transition away from the Apartheid system. After democratic elections were held in 1994, the Truth and Reconciliation Commission (TRC) was set up to investigate the human rights violations that happened against South African blacks. Controversially, the TRC was meant to deliver restorative justice, "the TRC was empowered to grant amnesty to perpetrators who confessed their crimes truthfully and completely to the commission" (*Truth Commission*, n.d.). The TRC also made recommendations that reparations be paid to victims. There were several hiccups and reforms with the TRC recommendations. Further monitoring bodies and taskforces had to be implemented to oversee and carry out work such as reparations and locating missing persons. Still, there were problems with the National Intelligence Agency destroying documentation and problems with reparation payments being delayed and less than the recommended amount. However, as post-war Germany and post-Apartheid South Africa have shown us, reconciliation takes time and doesn not need to be perfect to start moving in the right direction.

Residential schools for Indigenous children existed in Canada from the 17th century until the late 1990s. Residential schools were deeply harmful to Indigenous peoples. Students at these schools suffered devastating experiences, and over 4,000 children died at these schools. Recognition and reparations for these atrocities culminated in the "Indian Residential Schools Settlement Agreement, apologies by the government, and the establishment of the Truth and Reconciliation Commission, which ran from 2008 to 2015" (*The Residential School System National Historic Event*, 2020). However, like previous examples, the recommended course of reconciliation had its shortcomings. Many of the reparations are only applicable to direct claimants, former students at these schools, meaning that all the impacted families of deceased generations of students at these schools since the 17th century are not eligible. Furthermore, reparations are assessed on an individual basis and there is no action by the Government to address the systemic harms suffered over generations and the impacts it has had on Indigenous communities. Residential schools may not have taken as many lives as Nazi Germany or Apartheid, but the impacts were experienced over centuries. Reconciliation is an ongoing process that must be renewed with every new generation and Canada still has more work towards reconciliation with Indigenous peoples of Canada.

Another way to rebuild trust is to try new politics. A new type of political leader has emerged. From the likes of Sanna Marin, the Prime Minister of Finland (2019-2023), Katrin Jakobsdottir, the current Prime Minister of Iceland (since 2017), and Jacinda Ardern, Prime Minister of New Zealand (2017-2023), these leaders are bringing humanity back into the political sphere. For example, Ardern connected with people and involved them in the political process by communicating empathy and sharing her reasoning and feelings behind her decision making (Underwood, 2022). Ardern and others represent a shift away from the narrative that political leaders should be aggressive, stubborn, and masculine. Ardern's communication style was different, conveying emotion and using live platforms to respond to public opinions that makes her more approachable and personable.

Growing political polarization in Canada has been eroding public trust in the Government. Many participants spoke about the need for bold, visionary leadership. A platform built on common interests of the Canadian people could help unify an increasingly divided country. Perhaps a new style of government leadership that connects more with the people and builds common ground would help win back trust that has been lost.

Both recommendations—new strategies for reconciliation and for political leadership—under this area of opportunity seek to rebuild trust between the Government and the people. We recognize that these are large scale systemic problems. Reconciliation requires the Government of Canada to commit to long-term strategies to be implemented in a meaningful and impactful way for Indigenous peoples in Canada. Leadership style can change as frequently as the election cycle, but it takes someone with enough courage to try to find a different way forward. It is up to the Canadian people to support and vote for future leaders of Canada that may emerge who embody these new political ideals. However, people in the direct sphere of politicians such as political campaign managers, advisors, speech writers, and anyone who has an influence on the politician's outward facing appearance, could begin to implement these ideas.

Furthermore, core to both of these recommendations is borrowing models from other countries, one of Diamond's factors for overcoming crises (see Tables 2 and 3). The world has been undergoing trends towards globalization, which are more pronounced in domains such as trade and travel. There exists an opportunity to diversify influences and decenter the U.S.'s influence on

Canada. Actors such as news channels and history education in schools can influence the public and children's exposure to the models and histories of other countries, providing rich examples that Canada can learn from. Similarly, the Government of Canada can increase the number of diplomats it sends to other countries to study the systems there and bring back findings to Canada. While a more global approach to borrowing models from other countries can increase Canada's resilience, these models need to align with decolonization and political goals of Canada and need to be carefully adopted for a Canadian context.

### 4.1.2 Rebuild Trust Between People

**Cultural CLA metaphor – All for one and one for all**

Most of our research insights from the primary and secondary data pointed to a need for regaining the lost trust between people. The exclusion of perspectives of Indigenous and vulnerable groups, implementation of resilience models rooted in capitalism benefiting only the upper class, and power structure and influences that reinforce inequality in society today all contribute to the loss of trust between Canadians. While polarization of "left" and "right" politics has also contributed to loss of trust between people, it is more complicated and has deeper roots in ideology, economy, psychology, and even external interference at times. Lack of acknowledgement of diverse perspectives has reinforced inequalities in the system and enabled powerful actors to extract resources and wealth from unempowered or marginalized groups. Our solution to rebuilding trust between people focuses on three threads: allowing multiple perspectives to coexist, diversity and equity in resilience practices, and empathy.

**1. Allowing multiple perspectives to co-exist:** A tool such as Adaptive Management can be implemented by government and city staff, planners, architects, emergency management professionals, and community leaders to help focus on boosting engagement between different stakeholder groups, considering their needs and challenges, and welcoming more pluralistic perspectives while addressing critical problems. Adaptive Management supports flexibility and adaptability, which can help stakeholders cope with uncertainty and change. By building contingency plans and anticipating potential shocks and disturbances, stakeholders can minimize the negative impacts of unexpected events, capitalize on emerging opportunities, and adapt their strategies to changing circumstances. In context of our research

study, this tool can bring together people with lived experiences and people from different cultural and academic backgrounds, who can share their experiences and the challenges they faced while dealing with existential risks with practitioners, researchers, and experts from the field of existential risks and disaster management, who are addressing these challenges. This tool has the potential to make many stakeholders work towards a common goal through iterative "learning by doing" process. The tool has two important stages:

*Stage 1 - Structured Decision Making*: In this stage, it is important for city staff, planners, architects, emergency management professionals, and community leaders to involve diverse perspectives, interests, and knowledge stakeholders to develop a more comprehensive and nuanced understanding of the system, identifying key challenges and opportunities, and co-creating solutions that are more robust and sustainable for addressing the existential risks. This stage involves six steps:


*Figure 4.2 Steps for structured decision making*

*Stage 2 - Learning*: In this stage, by continuously monitoring and evaluating the performance of their interventions, stakeholders can improve their understanding of the system's behavior, identify feedback loops and tipping points, and develop more effective and efficient strategies to achieve their goals. This stage involves four steps:

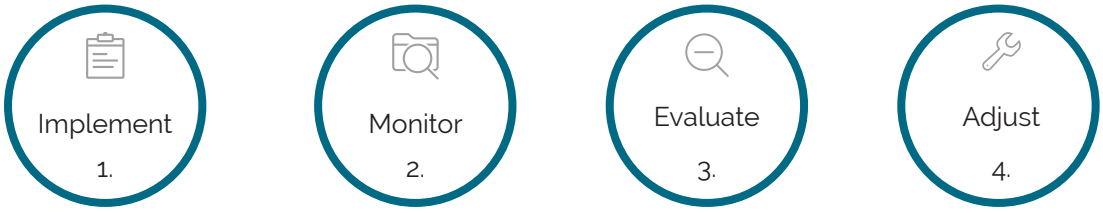



*Figure 4.3 Steps for learning*

**2. Diversity & Equity in Resilience Practices:** To bring in more diversity and equity in resilience practices, city staff and emergency management professionals can focus on building a system reflecting equitable resilience. In the book *Multisystemic Resilience*, Hogan et al. suggest four themes: attention to subjectivities, inclusion, cross-scale interactions, and transformation (2021). This develops a middle-range theoretical framework that takes into account the social, cultural, and political determinants that shape the distribution of resilience outcomes.

*Attention to subjectivities:* This theme emphasizes the importance of recognizing the unique experiences, needs, and perspectives of individuals and communities when designing and implementing resilience strategies for existential risks. By acknowledging and valuing the diverse identities and lived experiences of people, resilience efforts become more inclusive and effective. This could involve engaging with Indigenous and marginalized communities to better understand their specific challenges and needs, as well as co-designing solutions that are tailored to their contexts.

*Inclusion:* This theme involves creating opportunities for all members of a community including vulnerable populations and Indigenous communities to participate in resilience-building capacity and decision-making processes. By ensuring that everyone has a voice and a seat at the table, resilience models can become more democratic, transparent, and accountable. Inclusive practices might involve providing language access, accommodating diverse learning styles, and facilitating dialogue between different communities to gain their feedback in decision making.

*Cross-scale interactions:* This theme recognizes that building resilience to existential risks is not just an individual or community-level phenomenon, but is also shaped by larger social, economic, and political systems. Therefore, building resilience requires engaging with multiple scales of analysis and action, from the local, to community, to the global. This might involve collaborating with other communities or organizations, advocating for policy changes at higher levels of government, or leveraging transnational networks to share resources and knowledge. Promoting interactions between experts and the public to boost a comprehensive understanding of the crisis and act accordingly when required.

*Transformation:* This theme emphasizes the need for resilience efforts to not only respond to crises, but also to address the root causes of vulnerabilities and inequalities that exist in the system. This could involve transforming systems and structures that perpetuate inequities, such as racism, colonialism, and patriarchy.

**3. Empathy Mapping:** Another important aspect of building trust between people is to be empathetic. By showing empathy and creating a safe environment, we can help to establish trust, which is essential for building positive relationships and fostering collaboration while facing challenges together as a community. This is done by implementing tools such as journey mapping (*What Are Customer Journey Maps?*, n.d.), empathy mapping (Gray, 2018), and 8 ways of seeing (*Collaborative Innovative Thinking by Design*, 2022). These tools can be used by community leaders and activists, design practitioners and facilitators, teachers, and team leaders of any kind to help build empathy between people in a group setting.

For example, the basic process of empathy mapping involves creating a diagram or map that outlines the stakeholder's thoughts, feelings, and behaviors related to the given topic, although many permutations of this tool exist. The Empathy Map typically consists of four quadrants (see Figure 4.4) that capture different aspects of the stakeholder's experience (in relation to existential risks in our case).

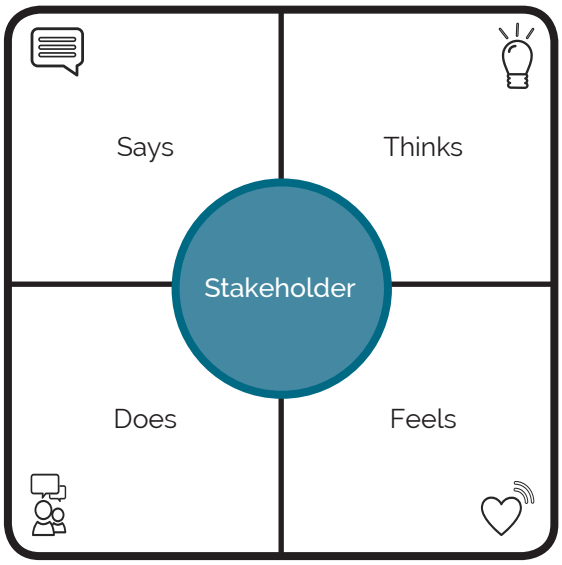



*Figure 4.4 Empathy Map template*

*Seeing:* What the stakeholder sees, hears, reads, and observes related to their experience of existential risks.

*Saying:* What the stakeholder says about their experience with existential risks,

including their opinions, feedback, and comments.

*Doing:* What actions the stakeholder takes related to existential risks, such as responding to government's plan of action, taking preventive measures etc.

*Feeling:* What emotions the stakeholder experiences related to existential risks, such as fear, lack of trust, or negativity.

All three of these strategies—allowing multiple perspectives to co-exist, diversity and equity in resilience practices, and empathy mapping—are strategies for rebuilding trust between people. One increasingly popular way to increase engagement and the number of perspectives on an issue is to increase social media presence. The organizations of these stakeholders such as government offices and departments, urban planning and architecture firms, and emergency management consultants can leverage social media to create more dialogue opportunities with the people that their work impacts. Unlike traditional media outlets which just disseminate information, social media platforms, when used intentionally for such purposes, can promote two-way dialogue; people can provide their perspective by commenting on posts and organizations have an opportunity to respond. Just like how Arden used social media to connect with people over political issues, organizations have an opportunity to use social media to be more approachable and personable and to open up dialogue channels.

These same organizations have an opportunity to implement tools like AM and Empathy Mapping to guide these conversations and dialogue with the people that their work impacts. The tools and processes outlined in this section could be packaged as a self-reflective toolkit for these organizations to incorporate as part of their professional practices. Perhaps one day it could be standard practice for every project and a part of their employee education, onboarding, and Diversity, Equity and Inclusion (DEI) training.

The empathy mapping tool is already widely available online but is catered towards UI/UX designers, design thinkers and strategists. We see such a broad use case for this tool that we think there is an opportunity to make this tool easily accessible online to the public. For instance, it could be a part of a toolkit packaged and available to the public for improving group discussions. More

broadly, cultivating empathy as a skill should start at a very young age. A version of this tool could be adapted to teach grade school children and to resolve conflicts in a school setting. Rebuilding trust between people can start with the generations of tomorrow. Cultivating empathy is as much about rebuilding trust to improve resilience on a grand scale as it is about building personal resilience.

### 4.1.3 Reframing Water, Energy and Food to Land, Water and Sky

#### Indigenous CLA metaphor – Traditionalism is at odds with Westernization

Water, energy and food are the building blocks of civilization. This frame is used by many global organizations and emergency and risk management practitioners to address security and existential threats to human survival. However, as we've seen in Section 3.2.2 this frame puts an emphasis on what humans need to extract from natural resources to survive; it puts direct human needs above all else. This frame overlooks that humans also need an Earth and all its ecosystems, including its abiotic and biotic features—these are indirect yet critical human needs for survival.

We propose using the Indigenous worldviews to reframe water, energy and food. By doing so we want to leverage and centre Indigenous knowledge, in a dominantly Western world, as a strategy to achieve success in creating more resilience for Canada.

From our learnings on Indigenous worldviews, we propose using Land, Water and Sky in conversations regarding human needs for survival. We intentionally capitalize each word to recognize and honour them as the living beings that Indigenous recognize them as. Like humans, Land, Water and Sky each have internal functioning systems and health associated with the proper functioning of those systems.

*Land:* Land encompasses the fertile earth we use to grow food, but other features such as mineral deposits, stone, fossil fuels etc. Land also absorbs and filters water. Land provides us with places to build infrastructure, buildings, and cities. Land supports plants and trees that convert carbon dioxide into oxygen. Land also provides habitats for animals, insects, bacteria, fungus, etc.

*Water:* Rivers, lakes and oceans provide humans and animals with water to drink, but also habitats for aquatic wildlife and plants. Water also falls from the sky and irrigates plants, forests, and agricultural fields. Floods replenish fertile soil. Rain removes impurities from the air.

*Sky:* Sky is the air that humans, animals, and plants breathe. Sky also provides space for migration and travel for avian wildlife, winged insects, and humans. Sky is the atmosphere that shields us from the most harmful parts of the sun's direct rays. Sky is temporary storage for water. Sky is wind currents for energy.

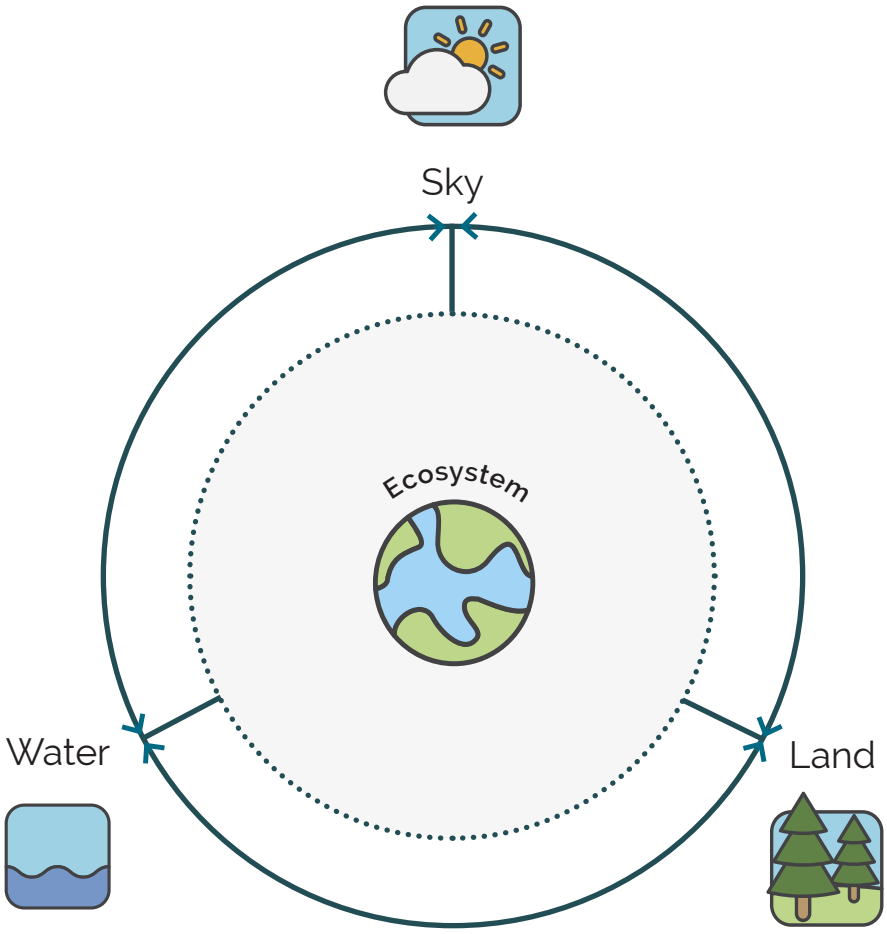



*Figure 4.5 Reframing water, energy and food to land, water and sky*

These brief descriptions seem fundamental, basic even, but are often overlooked, which is why we find it important to state the obvious. These descriptions are also far

more holistic than what is generally considered when we speak about water, energy and food. Air is so obvious and invisible; it is not even mentioned in the original frame as a necessity for human life, yet air pollution is a serious risk to human health. Land, Water and Sky immediately evokes generosity and empathy, or consideration, at least, for the other living beings we share these resources with.

As non-Indigenous scholars attempting to reframe water, energy and food into an Indigenous worldview, we want to acknowledge that we may have obvious shortcomings that are not obvious to us. Therefore, we hope this is only the beginning of what we feel is a very important discussion towards an opportunity to build resilience through shifting our dominant perspective. Just like other shifting narratives and discussions such as the shift from talking about homelessness to houselessness[1], a behavioural change is needed: a shift towards being intentional about how we refer to our natural resources. Today, social media is commonly used to reinforce these types of behavioural shifts. For example, social media channels that promote social justice and Indigenous rights could use their platform and voice to spread awareness about this language shift. We believe this shift also needs Indigenous championing to spread awareness about this and other Indigenous issues. An organization such as the Assembly of First Nations (AFN) could table this issue to be discussed among Indigenous leaders with the goal of presenting it to the Government of Canada for further implementation.

1. Houseless acknowledges a person's lack of a physical structure without questioning their belonging to a place or community, with the aim of being more respectful and removing stigmas connected with being labelled as "homeless" (Lambert, 2022).

### 4.1.4 Awareness Education on Existential Risks

#### Environmental CLA metaphor – Consumption makes us happy

Many insights from the interviews (experts as well as non-experts) clearly show there is a need to spread more awareness regarding potential crises in the system. Some interview participants highlighted how lack of resources (e.g. an emergency plan, information on the pandemic), government sources sharing misinformation, and misleading or inaccurate information on news and social media platforms created more challenges during the crisis. Experts spoke about how healthcare experts were silenced by politicians during pandemic to suit political agendas. While some participants discussed the misalignment of the economic agenda of the government and safety needs of citizens, increasing polarization in society. Our primary research indicates that expert opinions, news and social media channels, and communication between family and friends are the prime information sources that people depend on during a crisis. We have created a process that we believe emergency management professionals, and government and city staff could use to increase society's literacy on existential risks by implementing these steps:

*Leverage community networks:* By working with local communities, efforts can be made to enhance preparedness and response to potential existential risks. This can include developing contingency plans and emergency response strategies, as well as building local capacity for response and recovery from existential risks. By engaging with local communities, it may be possible to mobilize a greater level of support and resources than would be possible through other means.

*Engage in media outreach:* Outreach via media platforms can be a great tool for promoting awareness regarding existential risks provided the information is accurate and scrutinized before releasing. These media channels can also be used to provide guidance and prevention measures with the help of experts scanning and giving out correct sources of information.

*Engage in dialogue:* Engaging in dialogue with individuals and communities can promote a shared understanding of existential risks and promote collaboration in finding solutions. By bringing together diverse perspectives and expertise, it may be possible to develop more comprehensive and effective solutions to mitigate the risks posed by existential threats.

*Experts partnered with institutions and common people:* Professionals from the field play a critical role in disseminating accurate information and promoting behavior change in the face of crises. Experts should be at the forefront of addressing challenges and communicating with the public during crises. However, there is a need for experts to be engaged with other academic and government institutions to foster a dialogue and collaboration to tackle complex and interconnected challenges.

*Creating platforms for Indigenous voices:* Introducing a platform to amplify Indigenous voices can allow Indigenous leaders, scholars, and members to educate society on nonmaterialistic economies and other Indigenous practices that may help mitigate existential risks. The platform can also be used for facilitating interactions between experts, Indigenous, and other vulnerable community members to gain alternate perspectives and worldviews on existential risks discussing their needs and challenges in face of adversity. This platform will help experts to get exposed to new information and create an exchange of dialogue with the Indigenous community.

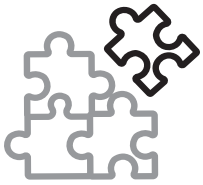
Ultimately, these strategies are about raising awareness of how our individual actions impact existential risks. We hope that by making this connection between individual actions and existential risks that we may influence people to change their behaviours. Many prominent universities have organizations devoted to research on existential risks: The Centre for Existential Risk at the University of Cambridge, Stanford's Existential Risk Initiative, and Oxford's Future of Humanity Institute. We believe that a Canadian think tank of this nature could be the key to raising awareness of existential risks among Canadians and furthering research on this topic that is rooted in a Canadian context.

This think tank could be a convening body where experts and academics could discuss issues around existential risks with activists, community leaders, and elders who can then spread information to people in their community. This think tank could partner with a media outlet or government body to poll people on ranking existential risks from worst to least concerning. Poll results could be made publicly and widely accessible online, either through a news outlet or government portal depending on the hosting agency. The think tank could hold public town hall meetings to discuss results and promote dialogue. The think tank could run sessions with companies and organizations (like the common "Lunch and Learn" format but we propose calling them "Lunch and Unlearn") to create an opportunity where instead of having experts speak on a topic, people

from vulnerable and marginalized communities can share their lived experience. This think tank could also organize a lecture series or a podcast on existential risks where experts and Indigenous people are invited to share their opinions to a public audience. In line with our other recommendations, this think tank could leverage social media to create an approachable and relatable presence, to promote dialogue on these issues, and to provide a platform for Indigenous voices through the growing trend of social media "takeovers" (an event where a person is given access to a social media account to create content for them by using it as a platform for their own voice). To conclude, a think tank of this nature provides a host organization where these efforts can collectively be focused to improve awareness and education around topics related to existential risks.

# 5.0

# Conclusion



# 5.0 Conclusion

We set out to answer the question, "How might we achieve more resiliency for a future Canadian society?" We have defined four key areas of inquiry necessary to answer this question: historical examples of societal collapse, existential risks, resilience, and alternative worldviews and perspectives.

Historical examples of societal collapse afford us the clarity of time to reflect on what went wrong and why. We know that some societies collapse while others recover based on their ability to anticipate, perceive, act, and successfully solve the existential risks they face. We also know that failure is always a result of human inflicted environmental damage in combination with one or more other factors: natural climate change, conflict with other nations, decreasing support from friendly nations, and failed problem solving. We have learned that society's bias towards achieving progress often leads down a self-destructive path. We have learned that increasing complexity requires increasing inputs for continued growth and at a certain point the inefficiencies of complexity provide diminishing marginal benefits. From understanding the events, causes, trajectories, and patterns in the past, we have created a better understanding of how to tackle current and future existential challenges.

We have examined existential risks through the lens of the three pillars of society: water, energy and food. We have examined the key trends for each of these three pillars and what they mean for Canadian society. We have explored current and future vulnerabilities and increasing complexity in the systems related to these three pillars. We have learned how interconnected these existential risks are and the need for a holistic, systems approach to increase resilience of these systems.

We have examined resilience from multiple angles. We have analyzed a framework for evaluating national resilience factors. We have explored resilience as a concept and how people perceive it. We have learned how efforts to build resilience require efficient decision making and collaboration within government, and attention towards equitable outcomes. We have learned that knowledge of complexity and interdependencies is required to monitor, manage, and maintain resilient systems.

We have learned that people's understanding of existential risks needs to be enhanced so they have awareness of impacts to their own safety and so they can be informed when making decisions to support resilience building efforts. We have learned that tools such as engaged scholarship can promote multiple perspectives when problem solving, and Adaptive Management can provide a process for addressing challenges in the face of uncertainty.

We have examined alternate worldviews in contrast to dominant worldviews. We have used the Causal Layered Analysis tool to further understand the litany, structures, and systems that shape worldviews and the metaphors that underpin them. We have selected and explored ten precepts that describe Indigenous worldviews and how they might help reframe our understanding of resilience to existential risks. We have learned of alternate perspectives on people's place within nature and of values that shape our behaviours and decisions that can support resilience building.

From our newfound understanding of these four key areas (historical examples of societal collapse, existential risks, resilience, and alternative worldviews and perspectives), we have identified six major themes that embody our key insights: refocusing worldviews, energy continuum, unpacking collapse, resilience framework, actual risk versus risk perception, and dominant and alternate worldviews.

Refocusing worldviews is centred on shifting our meta-mindset of how we approach worldviews. This includes moving away from Western colonial attempts to supplant other worldviews towards honouring a relational way of being and a plurality of worldviews that can enhance resilience. This insight also captures the need to shift our mindset of how we humans fit into the world.

Energy continuum focused on the impacts of increasing complexity on diminishing marginal returns on investments. As highlighted previously, failed decision making, and lack of government collaboration could play into a failed energy transition. Because of the interconnectedness of water, energy and food this is a looming future crisis. Energy use is tightly connected to climate change. As a global threat to humanity, this requires global-level cooperation to address this challenge.

Unpacking collapse explored a discussion about unsustainable population growth, excess food and starvation. Issues like global injustice, inequality, and geopolitical conflict create conditions where extreme poverty and starvation can coexist with extreme wealth and food surplus. It also further highlighted the need to address

basic human needs before collaboration to tackle more complex issues of climate change and resilience can take place.

Resilience framework explored the national resilience factors and patterns identified in the previous section. Here, we provided a comparative analysis of resilience factors for the U.S. and Canada. As a kind of scorecard, the discussion evaluated which factors weaken or strengthen Canada's resilience. The comparative lens allows us to identify key ways in which we are distinct from the U.S., as much research is focused on the U.S. and not on Canada.

Actual risk versus risk perception explored insights gained from participants and what shapes their perception of existential risks and the role of memory on our experiences. These insights led us to conclude that considerations for equity must be built into any model or framework designed to increase resilience.

Dominant worldviews and alternate worldviews explored how crises can be a catalyst for shifting worldviews, highlight existing weaknesses in the system, and refocus our attention on what's important. Colonial and capitalist ideologies have long reinforced the current power structures, and the impacts of the COVID-19 pandemic have eroded public trust in government. This section highlighted how Indigenous principles can help refocus our values on community welfare.

Lastly, we explored four areas of opportunity and offered practical and realistic ways to enhance resilience in Canadian society. To address lost faith in politics, we explored historical examples of rebuilding trust between government and people and a new type of political leader that can help win back the trust of the people. To break down individualistic mentalities and rebuild trust between people, we explored strategies such as allowing multiple perspectives to coexist, diversity and equity in resilience practices, and empathy. To leverage alternative worldviews and deconstruct anthropocentricism, we suggested reframing the three pillars of food, water and energy to land, water and sky. And to reverse the narrative that consumption makes us happy, we proposed five strategies for awareness education on existential risks.

# 5.1 Areas of Further Inquiry

From our research we have found some tangible suggestions for relevant stakeholders to implement as ways to build resilience for Canadian society, though our suggestions are not exhaustive. In the process of conducting this research and answering our research questions, we have inevitably raised more questions. Though we have not answered these new questions thoroughly, we present opportunities for further research and possible starting points for addressing these questions.

### Complexity of Canadian Systems and its Implications for Resilience

Growth and complexity seem to be inextricably linked. As the world's population continues to grow, so does the complexity of the systems that support it. But does increasing complexity parallel population growth directly? We have seen how interconnected the issues of water, energy and food are. We know that a systems understanding is required to enhance resilience of these pillars of society. What we do not know is what drives increasing complexity. We suggest that the level of interconnectedness is one factor driving complexity, but there are likely other factors.

How complex is the Canadian system? If we were able to discover more factors that drive complexity, we could comparatively analyze the Canadian system to determine a ranking for how complex it is. Then, an interesting question to ask would be: Is there a case to be made for reducing the complexity? Would that make the system more or less resilient? We have learned that redundancy is a factor of resilience and often an unwanted by-product of complex systems because it causes inefficiency. As Tainter has said, increasingly complex systems become inefficient and provide diminishing marginal returns at a certain point. At what point does a system become too inefficient?

There is another related theory on decentralization. Decentralization of systems re-localizes processes and breaks down large, centralized, and complex systems

into smaller instances of the system (Thackara, 2005). An example of this would be urban agricultural production that feeds the surrounding community. Victory gardens were an example of this that were employed to increase food production during war times. Are there new ways we can decentralize systems of water, energy, food, governance etc.? Would a decentralized model achieve a desirable reduction in complexity? Are there ways where combining Indigenous precepts and decentralization could provide new insights into resilience?

## A Global Strategy for Existential Risks

Globalization has introduced a whole new set of global existential risks that threaten all of humanity. Global inequality poses a large barrier to global collaboration on building global resilience to existential risks. Focusing on global collaboration is extremely difficult in a world where starvation and overconsumption coexist, yet starting this type of collaboration is too important to delay. Addressing global inequality and creating polycentric governance systems to address existential risks needs to happen in tandem.

Many models of polycentric governance systems exist. The North Atlantic Treaty Organization (NATO) is a military alliance between 31 countries, the United States-Mexico-Canada Agreement (USMCA) is a trade agreement between 3 countries (which superseded the North America Free Trade Agreement in 2020), the Five Eyes is an intelligence sharing alliance between five countries. Which of these (or other) models offer a promising template for a polycentric governance system to address future existential risks? Should a new organization exist to address existential risks, or should this be added to an existing organization's mandate? How will trust and accountability be governed in such a system? What role does the United Nations play in conversations regarding global existential risks?

## Icarus Flying Too Close to the Sun

As mentioned, there are varying degrees of severity in relation to existential risks. Throughout this research, examples of collapsed societies, recovered societies and societies that fall somewhere in between have been explored. Existing literature on societal collapse focuses on a binary categorization of collapse or survival. Where does this elusive tipping point between collapse and survival lie? Or do we need a

more nuanced gradient between the two?

When discussing resilience, a similar nuanced gradient exists. Survival, but also quality of life should be considered. Should we just be focused on avoiding irreparable collapse, or should we be reframing the future resilience of Canadian society to be something more hopeful? Should we measure our success based on how far a distance from the tipping point of irreparable collapse we can maintain? There is a body of research on positive futures and "protopia" that could offer interesting perspectives on resilience to existential risks in this regard.

**Protopia** – refers to building a desired future through incremental progress over a long period of time (Kelly, 2010).

These topics are outside of the scope of our research, but we believe they pose promising lines of inquiry to continue to advance research on resilience to existential risks. If you are interested in pursuing one of these paths or another, if you have feedback on our work, or if you have thoughts on our representation of Indigenous perspectives, we are open to hearing from you. You can reach us at kmiedema@ocadu.ca and ashwinig@ocadu.ca. The dialogue is open.

# 6.0

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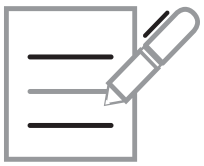

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# 7.0

# Appendices

## 7.1 Appendix A – Methodology

### Interview Guideline

**Context:**

- What countries have you lived in and which of those countries have you spent the most time in?

**Threat and Risk Perception:** For our research, we define an existential risk as a crisis that has the potential to result "in a society's extinction or near-extinction, during which very large numbers of people die or scatter. Recovery, if there is one, takes centuries [...]" (Wright, 2019).

- What are some present or future existential risks in the countries you lived in or traveled to?
- Who is most affected by these threats?
- Which present or future threats concern you the most?
- Are there any neglected threats in your opinion?

**Crisis Experience:** We've all very recently lived through a crisis—the pandemic—which is an often-mentioned existential risk.

- Where were you living throughout the pandemic and what was your experience with or reaction to the COVID-19 response (official or unofficial)?
- Who did you trust most? Why?
- How did the crisis manifest in terms of economic, political, and social dimensions and can you illustrate this with a specific example?

**Future Risk Response:**

- Going back to the existential risks you mentioned, what kind of solutions are there to those threats?
- Do you think they are sufficient? Why or why not?
- What could be done better, and by whom?
- Out of all, which solution is the most effective one according to you?

## 7.2 Appendix B – National Crises Comparison

This is a summary of factors affecting outcomes of the crises of six nations as presented by Diamond (2005) that we have compiled into a comparative table to find patterns (as discussed in Section 3.2.3). Finland and Japan both experienced crises that exploded into sudden upheaval, which were provoked by shocks from another country. Finland was dealing with increasing tensions with Russia that led to the Winter War and the Continuation War. Japan's crisis began with American demands for a trade agreement that led to the eventual Meiji reforms and Westernization of Japan. Chile and Indonesia both dealt with crises that erupted because of internal tensions.

Chile struggled with internal political and economic strife perpetuated by leaders such as Salvador Allende, who tried usher in a Marxist government, and Augusto Pinochet who led a military coup and subsequent military dictatorship that caused the suffering and death of many Chileans. Indonesia's crisis is a story of the struggle for unification of a diverse and divided population, independence from Dutch and Japanese colonial rule, the mass killings of 1965-66, and subsequent military dictatorship under Suharto.

And for Germany and Australia, the crises did not escalate suddenly but instead unfolded gradually. Germany's struggle is in recovering from the trauma and economic impacts of World War Two, atoning for its Nazi past, and re-unifying East and West Germany. Australia's crisis was one of identity; Australia slowly uncoupled from being a British colony and ended its White Australia policy, an official shift away from its overtly racist past.

In Table 3, green (also symbolized by a plus sign) indicates a factor that helped a country recover from their crisis, yellow (also symbolized by a slash) indicates a factor that neither helped nor hindered or did both at different times, and orange (also symbolized by a minus sign) indicates a factor that negatively affected the country. A blank white cell indicates that this factor did not contribute to the outcome of the crisis significantly.

| | Finland | Japan | Chile | Indonesia | Germany | Australia |
|---|---|---|---|---|---|---|
| National consensus that one's nation is in crisis | Finland ignored increasing Russian tensions. After consensus of the crisis, Finland leaders spoke with Soviet political leaders frequently to understand their point of view / | Increasing pressures from U.S. were hard for Japan to ignore: the U.S. escalated shows of naval presence in Japanese waters + | | | | |
| Acceptance of national responsibility to do something | After consensus that there was a crisis, Finland understood that it had to rely on itself to address the crisis + | | | | | Australia failed to take responsibility for its own security and allowed its military to atrophy – |
| Delineating the national problems needing to be solved | Finland could keep political independence by earning Soviet trust, and by sacrificing some economic independence and freedom of speech + | Meiji Japan made massive changes in many spheres of society while also retaining other traditional features. + | Chile ended its resistance to military intervention and ended government economic interference. Chile also ended its rejection of political compromise + | Indonesia recognized the need for political and economic reform + | Germany drastically reassessed its Nazi past, even if it took decades + | Australia has shifted how they view themselves, developed independent foreign policy, increased multiethnicity, and made political and economic shifts towards Asia and the U.S. + |
| Getting material and financial help from other nations | Finland did not receive any substantial support: Finland fought the Winter War on its own, and had support from Nazi Germany in the Continuation War – | Other nations were supportive and aided Japan in learning about and adopting their military, political and education models + | The U.S. restored economic aid to Chile after the 1973 coup, which helped the military dictatorship to persist + | After adopting a pro-West policy, Indonesia received Western investment and foreign aid to rebuild its economy (a decline caused by political instability) + | American Marshall Plan aid helped Germany rebound its economy, but extraction of war reparations severely hindered German industries / | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Using other nations as models of how to solve the problems | Finland had no similar models of small nations successfully resisting the demands of more powerful nations – | Japan's constitution and army are based on German models, its fleet on the British model, its initial draft civil law code on the French model, and educational reforms on the American model + | Chile used the U.S. economy as a model for its free-market economy + | Economic models tested in other countries were used to reform the Indonesian economy and achieve economic growth + | | |
| Strong national identity | Unique language, known for its musicians, athletes, architects, and designers, autonomy under Russian tsarist rule, military pride + | Japanese people and their leaders believed Japan to be unique and their devotion to tradition unifies a Japanese sense of identity + | Chilean pride in self-governance and unity from surviving military repression and government cruelty + | As a newly independent ex-colony, Indonesia began with only limited national identity – | | As a white British outpost surrounded by Asian neighbours, Australia suffered from a national identity crisis – |
| Honest national self-appraisal | As a small country that shared a long land border with former Soviet Union, Finland couldn't withstand Soviet attacks forever + | Japan's Meiji leaders recognized the strength of Western militaries, but Japan's hopeless initiations of WWII while already fighting China were disastrous and lacked knowledge and historical experience / | Pinochet was correct that he could prevail over his adversaries, but Allende incorrectly believed he could bring Marxist government to Chile / | Sukarno believed he could interpret the unconscious wishes of the Indonesian people and therefore lacked honest self-appraisal, but Suharto succeeded in replacing Sukarno over time / | | Australia has slowly come to realize that Britain is only a minor trade partner, and their former worst enemy Japan is their major trade partner, and their population has become less white British from immigration over the years / |
| Historical experience of previous national crises | | | | Limited experience with previous independence struggles – | Germany overcame crises in the unification against heavy odds in 1871 + | |

| | | | | | | |
|---|---|---|---|---|---|---|
| Dealing with national failure | A large fraction of Finland's population had suffered—they were killed, widowed, orphaned, or became unhoused from the actions of the Soviet armies—yet they prevailed + | Japan initially resisted but eventually accepted its opening to and learning from the West. Initial adoption of Western models didn't always work, and Japan tried several before settling on another + | Allende failed to fix Chile's economic and social problems with a Marxist government; Chile endured the tyranny of military repression for almost 17 years + | | Germany illustrates patience born from having to recover from defeat in two world wars + | |
| Situation-specific national flexibility | To appease the Soviet Union, Finland retroactively imprisoned wartime leaders, adopted an emergency decree to postpone an election, withdrew an electoral candidate, and self-censored its press + | Japan was able to make drastic changes while preserving their importance of tradition + | After stopping further military intervention, Chile retained the shift to a free market that the military had introduced + | | | |
| National core values | Maintaining independence was non-negotiable + | Loyalty to the emperor, military value of "no surrender" + | | The core values of the military were ones they were willing to kill for but not die for – | | |
| Freedom of action and freedom from geopolitical constraints | The long land border with former Soviet Union restricted Finland's geopolitical freedom – | Japan is an island archipelago free from land borders, which moderated geopolitical threats from other countries but did not eliminate them / | Chile's geographic isolation by mountains and deserts reduced threats from neighbouring countries but U.S. involvement created constraints / | Internal constraints of poverty and population growth limited Indonesia's freedom of action / | Germany shares many land borders with many nations which limited its geopolitical freedom significantly – | Australia was constrained as a British colony, but was tempered by its remoteness from Britain / |

*Table 3 Comparison of resilience factors of six countries*