BUSINESS RESPONSES TO CLIMATE CHANGE: A CASE STUDY OF SELECTED ORGANIZATIONS IN NEWFOUNDLAND

By

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ABSTRACT

Climate change is a problem that the world is struggling to solve. Many studies and much research have been directed toward this course, but we still face its impacts. Recently, scholars have investigated the relationship between climate change and businesses. Companies have begun taking responsibility for climate change and are finding ways to combat the issue. Climate change presents risks and opportunities to businesses. Therefore, this thesis aims to appreciate business responses to climate change in Newfoundland's natural resource sector. Using a qualitative study based on semi-structured interviews, the research examined how the selected businesses are responding to climate change. The major finding of the study was that Newfoundland lacks specific climate change regulations and requirements to drive adequate response measures from companies. It was revealed that the chosen organizations' significant sources of greenhouse gas emissions were transportation and the use of equipment and fuel. However, most of the businesses had implemented measures to reduce their carbon footprint and addressed some climate change impacts they face. In terms of the influence of institutional pressures on business responses, this research showed that mimetic force (copying similar actions among firms) played a major role compared to the other forces. Generally, this thesis highlighted that businesses are not immune to climate change, hence companies are incorporating the impacts of climate change into their planning and are adopting actions to address the problem.

Keywords: Climate change, business, isomorphism, Newfoundland, natural resources

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"I will give thanks to the LORD with my whole heart; I will recount all of your wonderful deeds" (Psalms 9:1).

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CHAPTER ONE: PRESENTING THE RESEARCH

1.1. Introduction

Climate change is a global phenomenon that has gained attention over the last two decades and has dire consequences for many sectors (Tobin et al., 2017), including businesses. The concern about climate change prevails in all aspects of our world today, including but not limited to: politics and governance, economic, social, and environmental realms (see Adepeju, 2018). Numerous debates are surrounding the occurrence of climate change, with some schools of thought believing that climate change is a natural phenomenon. In contrast, most of the variations in the natural climate is caused by humans (anthropogenic climate change; Ojha, Pattnaik & Rout, 2018). For instance, a recent report indicated that 100 energy-producing companies accounted for 71% of the total emissions from industries (CDP, 2017). Incorporating both viewpoints, the United Nations Framework Convention on Climate Change (UNFCCC) defines it as "a change of climate that is attributed directly or indirectly to human activity that alters the composition of the global atmosphere and that is in addition to natural climate variability observed over comparable time periods" (UNFCCC, 2011, p. 2). The need to tackle climate change features in plans and policies at the international, national, and local levels of government, which makes it an essential subject for discussion and research.

Regardless of what causes climate change, it poses a plethora of threats to our society, which requires adequate responses. This is not to say that identifying the root cause of climate change is irrelevant in finding solutions to the problems it brings. It is rather a more significant step towards adapting to climate change. Odunola, Odunsi, and Daramola (2019) highlighted that some climate change impacts might lead to "disruptions in the availability of food, water, health,

biodiversity, secure shelter, infrastructure, and social relations in the presence of degraded natural ecosystems" (p. 47). This statement corroborates the earlier reports about the concern and need for climate change solutions in all aspects of our lives. Canada and many other countries have executed projects at the national level to identify the impacts of extreme weather events (caused by global warming) on human lives and society (see Cheng, Auld, Li, & Li, 2011, p. 964) to find solutions to these problems. Some cities and municipalities have designed development plans considering the various climate impacts eminent in their localities to promote sustainability and ecological resilience. For instance, Jabareen (2013) has developed a Resilient City Planning Framework (RCPF) to aid cities in coping with climate change during city planning. At the international level, bodies such as the United Nations and World Meteorological Organization (WMO) have played pivotal roles in addressing the challenges posed by climate change. Hence, climate change is an issue that cannot be overemphasized and requires global efforts to overcome the hurdles it brings.

Climate change has implications for businesses ranging from “fast fashion to cloud computing and from banking and financial services to leadership issues facing coastal municipalities” (Nobel, 2017, p. 1). The business community around the world is not immune to the impacts of climate change. It is faced with developing response strategies to deal with the dangers emanating from climate variability. For example, Coca Cola, whose products depend on water, is affected by water scarcity – caused by climate change – and has improved its manufacturing processes by using technology that reduces the volume of water (from 2.7L to 2L) in manufacturing one liter of cola (Dewan, 2016). Also, Nike, a company whose raw materials for production depend on stable climatic conditions, has developed contingency strategies (such as improving water efficiency by 15%) in the short-term against climate change impacts on business

operations (SCWC, 2016). Thus, climate change is multifaceted, having countless physical manifestations, regulatory standards, consumer preferences, and levels of uncertainty.

In terms of climate change impacts, the natural resource industry, hereafter referred to as "the sector" (including forestry, mining, agriculture, oil and gas, and energy), is highly vulnerable. They require some mitigation and adaptation measures to ensure their resilience. Due to its geography, Canada's natural resources industries are especially prone to climate change's adverse effects (i.e., extreme weather events and hazards) during exploration, development, processing, transportation, and rehabilitation/decommissioning activities (Warren & Lemmen, 2014). For example, forest productivity is affected by temperature and rainfall patterns in the regions where they are located (Boisvenue & Running, 2006). Explicitly speaking, Corner Brook Pulp and Paper Ltd (CBPPL), which plays an essential role in the Newfoundland and Labrador forestry industry, manages about 1.4 million hectares of forest lands on the island of Newfoundland (Kruger Industrial, 2019) and is likely to deal with some of the impacts of climate change on forest growth. However, the organization has developed sustainable forest management plans following national standards and has improved industrial processes to reduce the greenhouse gas emissions that contribute to climate change (Kruger Industrial, 2020). Natural resource industries are fundamental blocks for economic growth and development in most countries; hence it is prudent to assess the impacts of climate change on these sectors and adopt adequate measures to ensure its sustenance.

Based on this background, we can conclude that climate change is a problem for every sector (whether controlled by governments or private businesses) and might be alleviated through global team efforts. Following this conclusion, the purpose of this thesis is to appreciate organizations' responses to climate change through a case study of selected organizations within the natural resource sectors in Newfoundland. This thesis focuses on natural resource sectors

because they are highly susceptible to climate change disturbances and play instrumental roles in development.

1.2. Problem Statement

There is a significant amount of literature on climate change and business. To mention just a few, Paul et al. (2017) assessed business strategies for climate change, de Abreu et al. (2017) developed a conceptual model for formulating corporate climate change strategy development, and Roman Pais Seles et al. (2018) highlighted some of the business opportunities and challenges of climate change. These studies emphasize the importance of corporate actions towards climate change and the increased involvement of businesses in this regard.

According to Jones and Levy (2007), business corporations are recognized as major contributors to global climate change and are also essential entities for creating innovative solutions to solve environmental problems. But there is no doubt that businesses are beginning to take responsibility for climate change and are making strategic decisions to face the issue's realities (Jones & Levy, 2007; Margolick & Russell, 2004). Businesses adopt many different actions in reducing their greenhouse gas emissions in the fight against climate change. A study conducted by Elijido-Ten and Clarkson (2019) indicated that a sample of the world's largest companies responded to climate change by increasing awareness in identifying hot spots for carbon emissions, involving business leadership in understanding the risks of climate change, and future-proofing their products from climate change. Another study by Wright and Nyberg (2017) on five companies' climate change responses included using renewable energy, training staff on carbon risks, making strategic plans, etc. Companies' responses towards climate change vary based on their preferences and may include "waiting, holding back, exploring, taking steps, innovating, or

learning" (Kolk and Hoffmann, 2007, p. 413). Paul, Lang, and Baumgartner (2017) indicated that there are two major perspectives concerning corporate responses towards climate change, namely the "inside-out" and "outside-in" perspectives (p. 53). The "inside-out" dimension stresses the activities within organizations that affect climate change, including improving processes and developing new products. The "outside-in" perspective refers to the impacts and regulatory pressures associated with climate change, which push companies to adopt adaptation mechanisms.

Amidst these growing discussions on climate change and business, there is scholarship on the risks and opportunities that climate change confers on companies (Roman Pais Seles et al., 2018). For instance, businesses operating within the tourism industry are likely to bear climate risks such as extreme weather events, which could be a downside to businesses' profitability (Chin, Day, Sydnor, Prokopy, Cherkauer, 2019). On the flip side, Impossible Foods, an innovative food tech company, is developing a veggie burger to replace meat burgers on the market (Mravca, 2016). Their move is to capitalize on the opportunity climate change brings by reducing emissions related to livestock rearing and expanding their market niche through an alternative product. These examples portray the dynamic nature of climate change in terms of its effects on businesses and the approaches firms adopt to tackle the issue.

Although existing literature highlights corporate responses towards climate change, there is a potential gap in understanding why organizations are taking steps to reduce global climate change impacts. Is it to take advantage of the opportunities that exist because of climate change? Or because their businesses are affected by climate change? Or because of some other pressures? Despite many corporate actions to help combat climate change, there is still little improvement in greenhouse gas emission reductions worldwide (see CDP, 2017). These questions have triggered

this thesis' overarching objective of identifying and appreciating business responses to climate change in Newfoundland's natural resource sector.

1.3. Research Questions

Several questions have prompted this thesis, as mentioned earlier, but a more salient question that encompasses the focus of this thesis is how are organizations in Newfoundland's natural resource sector responding to climate change? To answer this overarching question, the three sub-questions listed below will be explored. A case study was conducted on selected natural resource companies in Newfoundland.

- What are the organizations' perceptions and impacts of climate change?
- To what extent have isomorphic pressures (driving force to adopt similar actions) influenced the organizations' climate change responses?
- What are the companies' climate change responses?

The justification for the research questions is as follows. The first question was formulated on the premise that although climate change is happening, some people and organizations do not believe its existence (see Howe, 2018), hence the opportunity to investigate what these organizations think about climate change as well as its impacts. This question's answers may link with the kind of action (i.e., reactive, pro-active, and no action) taken by these organizations. The second question was informed by literature on antecedents or triggers of organizational response towards climate change (see Jones and Levy, 2007, p. 431). The third question flows from the second because, if there is a driving force to act on climate change, what are the corresponding strategies or responses.

1.4. Theoretical Framework

This thesis utilizes the widely accepted underpinnings of institutional theory (Scott, 2013), one of the prominent theories used to explain organizational behavior and patterns (Fuenfschilling & Truffer, 2013). Every organization operates in an institutional environment which influences their behavior. An institutional environment can therefore be described as comprising organizations that "in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (DiMaggio and Powell, 1983, p. 148 as cited in Fuenfschilling & Truffer, 2013, p. 774). This means that there are rules, norms, and culture governing organizations or institutions in any setting. According to the theory, firms do not make decisions based on only efficiency and rationality but also consider social and cultural factors pertinent to their decisions' legitimacy (Sherer, Meyerhoefer, & Peng, 2016). This connotes that aside from companies having their plans with sets of actions to increase growth, other external factors may influence such actions. These factors are what institutional theory seeks to explain with the components of the theory.

One main component of institutional theory is isomorphism, which assumes that all companies or organizations within an institutional environment become the same over time regarding the practices and strategies they employ. A typical example of isomorphism is the rather banal practice of publishing sustainability reports by many companies worldwide. Isomorphism manifests in three folds: coercive, mimetic, and normative isomorphism (Sherer et al., 2016). Coercive isomorphism is attributed to the adoption of similar practices by organizations because of regulatory compliance. Mimetic isomorphism is where a company copies a successful strategy used by another firm. Normative isomorphism is when companies learn from each other through

professional links by following guidelines specific to the industry. These isomorphic pressures have been used to explain firms' behavior and will be applied in explaining the force driving the actions of organizations in addressing climate change.

1.5. Significance of the Study

There is an existing call for attention to climate change and its implications on businesses (see Jones & Levy, 2007). As a result of these ongoing discussions, this study seeks to contribute to the existing literature by exploring a different dimension of the subject matter by highlighting the impetus behind firms' actions in combating climate change. The perceptions of the various organizations on climate change can add to the literature on climate change believers and deniers. Also, Newfoundland and Labrador has been under-studied with respect to the topic of climate change and business, hence this research will provide some literature on the subject. The findings of this study can spark other related research, such as investigating whether actions adopted by companies are geared towards business as usual or genuine concern for climate change, how climate change perceptions influence actions or inaction, etc. This research could also serve as a platform for other organizations to learn from the various response options available in dealing with climate change.

1.6. Organization of the Study

This thesis is structured into five chapters. This first chapter introduced the study by providing a background to the study, highlighting the problem, and outlining the questions for inquiry. The second chapter reviews the existing literature relevant to the subject by exploring broader topics like business perceptions on climate change, business responses to climate change,

type of strategies adopted, and motivations behind their actions. The concept and underlying components of institutional theory are discussed in the same chapter. The third chapter focuses on research design and methods. In this chapter, the contextual characteristics of the natural resource sector in Newfoundland are highlighted. The chapter further provides information on the procedure for organizing the research, including contextualization, research approach, data collection, research design, data processing and analysis, validity and reliability, and limitations of the research. The fourth chapter presents the results from data collection and a discussion of the results using themes. The fifth chapter which is the final component of this thesis, is used to summarize the findings and provide recommendations to the study.

CHAPTER 2: REVIEW OF LITERATURE

2.1. Introduction

The first chapter of this thesis introduced the research by establishing the overall purpose, central objective, and research questions. It portrayed that businesses have recognized the reality of climate change and are responsible for driving solutions to respond to its various effects. Thus, it is ideal to review existing works on business and climate change to understand the discussions related to the above. Given the broad nature of the topic, this chapter focuses on three major themes. These include perceptions of climate change, impact of climate change on businesses, and business responses to climate change.

The discussion in this chapter is backed by relevant literature and interspersed with the thoughts of the researcher. This chapter also explores institutional theory to examine the forces behind companies' behavior and actions. An advantage of adopting a theoretical approach is to help position the research (Barczak, 2014) and contribute to the literature on the topic.

2.2. Perceptions of Climate Change

2.2.1. General Perceptions

Climate change has received significant attention in our society. In the U.S., for instance, the first public survey on climate change was conducted in 1986, and since then, countless surveys have been administered to get public opinions on the risk of climate change (Brulle, Carmichael, and Jenkins, 2012). Climate change has become part of our lives, hence the need to adapt to its impacts and dangers has become imperative, regardless of the difficulty in achieving it. Mertz, Mbow, and Reenberg (2008) highlighted that there is scientific consensus that climate change is

happening, and its impacts are likely to project well into the future such that mitigation alone will not be enough to solve the problem. However, there is some skepticism about climate change which usually acts as a barrier to solve the issue (Weber and Stern, 2011; Semenza et al., 2008). For instance, in the U.K., there has been a steady drop in public concern about climate change with a growing number of skeptics (Spence et al., 2011). Myers et al. (2013) attributed the uncertainty and disbelief of climate change to the mathematical and statistical projections involved in its communication. Overloading people with so much information can breed doubts (Ballantyne, Wibeck, and Neset, 2016).

Brulle et al. (2012) also indicated that the difficulty in understanding scientific information could cloud people's opinions on the seriousness of climate change. Climate change has commonly been described as a 'wicked problem' (see Winn et al., 2011) facing governments, institutions, non-profit organizations, businesses, etc. There is no simple solution that can tackle the multi-faceted challenge of climate change. As a result, all dimensions of practical solutions for climate change must be explored. In doing this, one must understand the views and perceptions of people on climate change to inform the responses and actions that are needed to address the issue (see Maltby, Simpson, and Turner, 2021). Thus, the section seeks to bring forth the ongoing discussions on climate change perceptions across various disciplines.

According to Clayton and Manning (2018), scholarly articles on climate change were traditionally centered on the natural sciences. Recently, more research has been geared towards understanding the human dimensions of the issue as the science of climate change has become more established. Maltby, Simpson, and Turner (2021) highlighted that many studies on drivers of climate change risk perceptions and their variations among different people had been reported across various disciplines. This shows that there is somewhat a shift in research on climate change

from understanding its science to the socio-cultural aspects of the issue. A report by Intergovernmental Panel on Climate Change (IPCC) indicated that "it is extremely likely that more than half of the observed increase in global average surface temperature from 1951 to 2010 was caused by [the] anthropogenic increase in GHG concentrations and other anthropogenic forcing together" (IPCC, 2014, p. 5). This implies that human activities have significantly caused the earth's climate to change. For instance, China, the most populated country globally, is the largest emitter of greenhouse gases with 10.6 billion metric tons in 2018, followed by the United States (Blokhin, 2020).

Essentially, research has established a direct connection between anthropogenic greenhouse gas emissions and some climate disasters such as flooding, especially in England and Wales (Pall et al., 2011). A recent study on Arctic Ocean salinity and currents revealed that human-made changes – affecting the climate – have reduced the salt content in the ocean (Jahn and Laiho, 2020; Haine, 2020). Individual behavior in households is also a contributing factor to GHG emissions (Dietz et al., 2009), as is industrial activity. Household consumption of energy and personal transportation by individuals are significant sources of greenhouse gas emissions (Semenza et al., 2008). The Intergovernmental Panel on Climate Change has provided several warnings on how anthropogenic climate change can lead to hunger, malnutrition, wildfires, and food scarcity by 2040 (Krishna, 2021). The human-induced causes of climate change and the effects confirm the importance of studying the human and perception aspects of the issue.

In 2019, a petition was signed by a group of self-acclaimed 'scientists' rejecting the notion that human activities contribute to climate change; hence no policy should be made to that effect (Caserini, Coyaud, Persico, and Messori, 2021). Initially, this petition was at a national scale until a similar declaration – stating that climate change does not pose any threat to humanity – was made

in the same year, which gained the international community's attention (Caserini et al., 2021). The related implication is that more studies are needed to identify why some people choose to ignore climate change and to evaluate the science behind their claims, if any. Anthropogenic climate change skeptics are typically people who hold conservative ideologies and seek to preserve societal structures (Jylhä & Akrami, 2015; McCright & Dunlap, 2011; Milfont, Abrahamse, and MacDonald, 2021). One primary source of climate change skepticism is the media consumption of far-right news (Krishna, 2021). According to Feldman, Maibach, Roser-Renouf, & Leiserowitz (2012), this kind of news from the media precipitates skepticism of and debate on the truthfulness of climate change, which influences peoples' beliefs. Whether a person believes in climate change or not may have to do with the kind of information presented to them and the credibility of the information, since disinformation has been one of the significant reasons for climate change denial (see Jacques, Dunlap, and Freeman, 2008).

Despite the apparent contributions of human activities to climate change, several barriers hinder climate action. An example can be drawn from the United States. Before the Kyoto Protocol 2005 climate change conference, the Senate passed a resolution to reject any agreement that did not seek to provide emission targets for both developing and industrialized countries (Leiserowitz, 2006). After that event, the U.S administration at the time withdrew from the negotiations set out in the Kyoto Protocol 2005 and established a legislative instrument to expand oil and natural gas drilling, coal mining, and the construction of fossil-fuel burning plants (Pianin and Goldstein, 2001; Revkin, 2001; Cheney, 2001). More recently, former president of the United States, Donald Trump publicly expressed his disbelief in climate change through tweets on social media (Krishna, 2021). This shows that the U.S, which is the second-largest emitter of greenhouse gases, harbours substantial skepticism of climate change (see Krishna, 2021). Also, public opinions and polls over

the past decades show that climate change is regarded as only a minor problem in the U.S. (Brulle, Carmichael, and Jenkins, 2012). It can therefore be concluded that the U.S. has still not fully recognized the salience of climate change.

According to Semenza et al. (2008), strategies to reduce climate change must be mobilized promptly, but this is constrained by institutional barriers, technical challenges, and the lack of political committment. The option left then is to expect voluntary actions from individuals and organizations concerned with mitigating the deleterious effects of climate change. Referring to the U.S. case, after the U.S. withdrawal from the Kyoto Protocol 2005, the public will be instrumental drivers in reducing climate change impacts through individual sustainable behaviors, pushing the government to act on the changing climate. These actions from individuals must be promoted because they have a significant impact on tackling climate change. Individual behavior can substantially help solve the problem if they are well-informed and concerned about climate change, have the will to act, and change their ways (Semenza et al., 2008, p. 480).

There is a general perception that awareness of climate change through experiences and social interactions can heighten people's belief in climate change and influence their actions to adapt to it (Li et al., 2016). For example, people exposed to extreme weather events are more likely to be concerned about climate change (Weber, 2011) and adopt ways of mitigating the problem. Brulle et al. (2012) buttressed this point by highlighting that a segment of the public's opinions on climate change is merely based on ideological and social identities. Others rely on communication from the media and real-life incidents to structure their views. The impression is that when people feel connected to some of the potential consequences of climate change, they are poised to believe that a difference in their behavior can drive solutions hence their actions to adapt or mitigate the problem. A famous movie released in 2006 titled "An Inconvenient Truth" was about educating

citizens of the U.S. on global warming and was a significant influence of media on promoting the seriousness of changing climate (Andrews and Caren, 2010; Brulle et al., 2012).

In a study conducted by Semenza et al. (2008) on climate change perceptions, the majority of respondents said they were aware of climate change. This indicates that awareness is different from concern because the latter is the next step towards solving the problem. In this same study, individuals with lower incomes were much more concerned about climate change than higher-income individuals who perceived less risk concerning climate change. Linking the concern for climate change with behavioral modification, individuals with higher levels of education and youth were more likely to change their behavior to mitigate the impacts of climate change. These findings corroborate with research conducted in 1992, which stated that "the higher the individuals' level of education, the more aware they are of elite cues and the more likely it is that individuals will respond in accordance with those cues" (Brulle et al., 2012, p. 170). To explain further, if an individual has completed university or higher education, then there is a probability that he/she will be aware of an issue like climate change and follow the guidelines or actions required to lessen its threats. Brosch (2021) has also revealed that the emotions of people are a factor influencing climate change perceptions and actions. Brosch's paper elaborates substantively on how climate change communication can trigger emotions and acts as an enabler or barrier to climate change actions. One striking point made in the article is that empirical evidence suggests that fear-based (negative) messages about climate change tend to spark more adaptation actions than hope-based (positive) messages. These studies reveal that many factors such as gender, income levels, age, emotions, affect, etc., come into play when dealing with climate change. Overall, a large chunk of the world's population may be concerned about climate change, but the issue is whether individual actions are being taken to address the global problem.

Additionally, a study on farmers' perceptions of climate adaptation behavior revealed that farmers were more likely to adopt adaptation mechanisms when aware of severe climate events (Li et al., 2016). Already stated, this relates to the idea that personal experiences with climate change are significant precursors driving climate adaptation actions. To sum it up, Maltby et al. (2021) provide a neat categorization of drivers of climate change perceptions and activities by including psychological determinants (such as emotions), experiential processing, socio-cultural factors, and socio-demographic characteristics. The dynamism of climate change perceptions is intrinsic in all these studies, demonstrating the need to adopt multi-dimensional ways to solve the problem.

2.2.2. Business Perceptions

After highlighting some of the general perceptions on climate change, this section seeks to bring forth the views on climate change from a business perspective. At the beginning of this chapter, a point was made about the need for global efforts to adapt to the risks of climate change. As businesses, organizations, and firms are essential entities for achieving this collective goal, their perceptions and ideologies on climate change are presented as far as studies on the issue are concerned. The objective for focusing on business perceptions is to "gain insight into the manner in which [businesses] and industry stakeholders view and understand climate change as well as the policy implications of how to better communicate, encourage and manage effective and purposeful climate change-related actions" (Kallstedt et al., 2008; Pandy and Rogerson, 2019, p. 227). Basing the research on perceptions is an appropriate method for identifying intersections between businesses' ideas and appropriate actions regarding climate change.

There is no qualm that the corporate sector and businesses are aware of climate change and the threats it poses to our society (Rothenburg and Levy, 2012). However, some business interests

work actively against climate action due to the organizational power they possess (Wetts, 2020). The international community and several studies have indicated that businesses are significant contributors to climate change. In one of its submissions, the World Business Council for Sustainable Development stated profoundly that industrial processes and activities – primarily business-oriented – are the major contributors to global greenhouse gas emissions (Okereke, Wittneben, and Bowen, 2012). According to Rothenburg and Levy (2012), companies like General Motors and Ford obtain climate change information from interacting with academic experts and government agencies and participative programs. Given this, climate change awareness in the business fraternity is now well established. However, the perceptions on the risks climate change pose to firms differ across various sectors. According to academic literature, climate change risks to businesses are characterized into three main categories, namely physical danger, regulatory risk, and market risk (Sakhel, 2017).

Physical risks relate to direct impacts from climate change such as storms, sea-level rise, changes in weather, floods, etc. (Hampel et al., 2010). Regulatory risks are policies and legislation (such as carbon tax, emission targets) that companies must adhere to due to climate change. At the same time, market risks including change in demand and disinvestments affect businesses by changing their products and operations to suit consumers' preferences and the financial market due to climate change (see Baiocchi et al., 2010). For example, climate change may alter consumers' attitudes by persuading them to purchase more sustainable products. According to a study conducted by Sakhel (2017) on business climate risk perceptions, companies in the U.K. perceived the most relevant risk in the short-term to be a regulatory risk while the other risks were likely to occur later in the future. The reason is that most companies are required to comply with strict regulations on emission standards and reporting, which to an extent may have a financial

impact on companies' operations. Under the three significant risks (regulatory, physical, and market), specific risks that companies viewed as having a significant effect were cap and trade schemes, changes in precipitation and droughts, and reputation, respectively.

To provide a clear picture of business perspectives on climate change, Begum and Pereira (2013) conducted a study on a wide array of companies (i.e., multi-national, large, small, and medium) representing different sectors in Malaysia. According to their findings, all the respondents knew about climate change, with newspapers and television as the most common sources of climate-related information. In terms of the companies' understanding of climate change, it was interesting to find that most of the respondents claimed their operations do not affect the climate, and climate change had no significant impact on the nation's economy. However, most of the respondents viewed climate change as a threat to their business. Based on the findings from this study, it can be deduced that some companies do not have an adequate understanding of climate change and are much interested in how climate change impacts their business rather than adapting to climate.

Tourism contributes to economic growth and development, especially in developing countries (Dube and Nhamo, 2020). Some benefits of tourism include employment, increasing immigration, foreign investment, and helping communities (see Hopkins and Maclean, 2014). Most businesses in the tourism industry depend on favorable climatic conditions to operate, making it a climate-sensitive venture. However, the rise in global warming and a changing climate has become an impediment to businesses in this industry (see Scott et al., 2019). This situation alone is an opportunity for tourism businesses to act on climate change and adapt quickly. Nevertheless, Scott (2011) argued that tourism businesses are not adequately prepared to tackle the impact of climate change. However, their input is needed to drive climate change solutions to

achieve sustainability. There are often criticisms alluding to the fact that tourism businesses are more focused on making profits than addressing climate change (Scott, Hall & Gössling 2016b; Dube and Nhamo, 2020). It is on this premise that investigating perceptions of climate change becomes necessary.

Some studies have delved into tourism businesses' perceptions of climate change, especially in the global North. To mention just a few, Hopkins and Maclean (2014) found that some tourism businesses in Scotland believed that waiting for climate change knowledge to expand before adapting is an important business strategy. In Germany, some ski operators had doubts about the science on climate change – and attributed this perception to media reports (Hoy et al., 2011). In Australia, Bicknell and Mac Manus (2006) established that competition among firms in the skiing industry influenced their perceptions and responses to climate change. Shakeela and Becken (2015) also studied the perceptions of tourism stakeholders in the Maldives. They revealed that the concern for climate change was not a priority for local stakeholders and their current actions were inadequate to adapt to future climate risks.

Lastly, Pandy and Rogerson (2019) did an in-depth study of tourism businesses' (such as small and large hotels, guest houses) perceptions of climate change in Johannesburg. The findings were that most of the companies were aware of climate change. Employees of these companies derived climate change knowledge through different channels such as television and radio news, and internal company discussions. In terms of climate change risks, most businesses did not see a significant impact on their business in the short term. These studies portray a diverse range of climate change perceptions in businesses, which speaks to why they need to be investigated to enable appropriate policy responses.

To wrap up this sub-section, it is a fact that businesses are aware of climate change and are continually drawing much attention to it since the late 1980s (Rothenburg and Levy, 2012). This growing attention has sparked several responses, which are highlighted later in this chapter. However, there is still a notion that businesses' response is inadequate to match up to their contribution to anthropogenic greenhouse gas emissions globally (Linnenluecke & Griffiths, 2010; Pinkse & Kolk, 2012; Sussman & Freed, 2008; Pinkse & Gasbarro, 2019). This is an opportunity for scholars to delve more into assessing business responses to climate change.

2.3. Climate Change Impacts on Businesses

Businesses have been labeled as significant contributors to climate change and should take responsibility for solving the issue (see Okereke, Wittneben, and Bowen, 2012; Rothenburg and Levy, 2012). However, when business and climate change are studied closely, there exists a paradoxical relationship between them. On one hand, businesses contribute to economic growth and development through employment and services but on the other hand, these also destroy the climate through greenhouse gas emissions. The positive side of firms' operations should not be overlooked in climate change discussions. The dangers and risks climate change confers on businesses need to be highlighted and investigated. The discussion on this aspect of climate change and business is still in its contemporary stage and has received scant attention (Tashman, Winn, & Rivera, 2015; Pinkse and Gasbarro, 2019; Winn et al., 2011).

The impact of climate change affects businesses in a myriad of ways. Pinkse and Gasbarro (2019) highlighted that aside from climate change affecting nations, it presents a challenge to businesses as well. In a report by United Nations Framework Convention on Climate Change (UNFCCC), the projected cost of climate change to be borne by private businesses in 2015 hovered

around USD 4.2 trillion (UNFCCC, 2017). Also, small businesses that are adversely impacted by climate change do not have the financial muscles and resources to respond to the relevant dangers (Tierney, 2007; Ngin, Chhom, and Neef, 2020). The problem is that if companies are unable to deal with the potential climate change consequences, they become vulnerable. Speaking of vulnerability, companies in the natural resource sector such as agriculture, forestry, energy, oil and gas, and mining are prospective victims of climate change. This is so because these sectors' growth and development depend on the natural environment and climate. According to Intergovernmental Panel on Climate Change [IPCC] (2007), these industries are mainly located in climate-sensitive areas. Inferentially, the impact of climate change in the natural resource sector is equally important and worthy of study.

There are direct (physical) and indirect impacts of climate change on businesses (Tsalis and Nikolaou, 2017). The physical effects of climate change are evident in many ways in our world today. For instance, in March 2019, a cyclone took the lives of people in the southern part of Africa; in 2020, wild bushfires swept through the livelihoods and land of Australia; and there is severe drought in East Africa, floods in South Asia, as well as a dry corridor in Central America (Oxfam, 2021). These events, which are most likely associated with climate change, are severe with enormous socio-economic impacts. That said, businesses located in the areas where these events occurred may suffer from the damages caused and are likely to experience some difficulties in bouncing back to normal operations. Direct risks of climate change are usually evident in business sectors such as agriculture, tourism, insurance, winter sport, and the mining sector (Tsalis and Nikolaou, 2017). According to Aldred (2004), property insurance is more prone to climate change impacts than any other type of insurance. Empirically, a study on anticipated effects of floods, storms, droughts, and extreme winters on firms in different sectors – including agriculture,

aviation, manufacturing, transportation, etc. – showed that all the climate-driven events or disasters have negative impacts on businesses in the short and long term (Winn et al., 2011).

A typical example can be appreciated from a study conducted in Cambodia on how climate change affects organizations in a town called Kratie (Ngin, Chhom, and Neef, 2020). In this study, the significant impacts of floods and storms (caused by climate change) on businesses in the town were fewer clients, drop in profits, distorted production chains, damaged shop/stalls and products, and mental health problems (Ngin, Chhom, and Neef, 2020). In a similar vein, Chin et al. (2019) indicated that climate change impacts on tourism businesses in two communities were related to business profits, customer numbers, business operations, and employee hiring. From the above, climate change impacts can affect physical, social, financial, and even health consequences in businesses and their employees. This illuminates the impact of climate change across all facets of our life.

Some studies have suggested that climate change has a link with the value of a company. Noh (2017) highlighted that financial valuation alone is not sufficient to determine the worth or value of a company. Instead, the inclusion of natural environmental factors in company valuation has gained prominence in recent times (ibid). Since nations signed the Kyoto Protocol 2005 and other climate change-related agreements to reduce GHG emissions, companies have joined this movement either voluntarily or by regulatory compliance. This has led to several studies on how reducing GHG emissions affects a firm's value. Chapple, Clarkson, and Gold (2013) suggest that companies emitting low GHG's and having better environmental performance records are comparatively deemed to have higher values. When companies realize that improving their ecological performance increases their financial outlook, they will be motivated to prioritize the environment in their operations (Iwata and Okada, 2011). However, Kim and Lyon (2011) pointed

out that the information and metrics on GHG emissions of companies may be biased, which will not reflect the firm's actual value; thus, a possible negative relationship between reducing GHG emissions and a firm's value may exist.

Furthermore, Saka and Oshika (2014), in their study of Japan's mandatory GHG emissions disclosure, established that no positive relationship between carbon emissions and a firm's value could be drawn from the available data. In a nutshell, the fact that greenhouse gas emissions cause climate change cannot be disputed. Hypothetically, reducing GHG emissions equates to reducing climate change impacts, which increases the value of firms from the business perspective. Therefore, it can be concluded that the effect of climate change on businesses may either increase or decrease a company's value depending on the scenario.

Governments across the world have implemented policy tools and actions for the fight against climate change. In public policy, these tools are divided under three main umbrellas: regulatory instruments, market-based instruments, and voluntary instruments (Evangelinos et al., 2015). Regulatory instruments are commonly legislation (e.g., Saskatchewan's Management and Reduction of Greenhouse Gases Act) passed by parliament to restrict people's behavior. Market-based instruments are economic-driven programs (such as carbon taxes, subsidies, etc.) to incentivize certain behaviors. In contrast, voluntary instruments are usually agreements negotiated to encourage and recognize recommended actions from individuals or the public (e.g., ISO 9000). Due to climate change, many governments have passed regulations to control companies' greenhouse gas emissions. Tsalis and Nikolaou (2017) pointed out that these climate change regulations cause a significant challenge for the business fraternity. This is because businesses must adopt new strategies and technologies – which are expensive – to comply with government regulations to reduce greenhouse gas emissions (ibid). This can be burdensome and may even

affect the reputation of businesses (see Coburn et al., 2011). Most consumers and investors prefer to associate themselves with companies having low carbon footprints; hence, climate change regulations enforced by governments significantly impact firms. In the short term, companies will bear the cost of carbon emissions but benefit from the goodwill associated with their actions in the long run.

A classic example is a lawsuit filed against Exxon, an oil and gas company based in the US. The company was alleged to have made false declaration of its climate costs as required by law (Peltz, 2019). The court claimed that the company hid two of its accounting books intending to deceive the public, shareholders, and investors. This demonstrates how the enforcement of climate change regulations can affect firms. In Exxon's case, the company's reputation may be destroyed which can affect it negatively. In sum, climate change impacts businesses both directly (including disrupting business operations, increasing maintenance and materials costs) and indirectly (see Agrawala et al., 2011) – confirming the relevance of identifying these impacts and shifting conversations away from the idea that businesses are 'solely' responsible for climate change. It is crucial because companies contribute a great deal to the socio-economic development of every nation, so if they collapse because of climate change pressures, the repercussions may be unsurmountable (c.f. Pinkse and Gasbarro, 2019, p. 335).

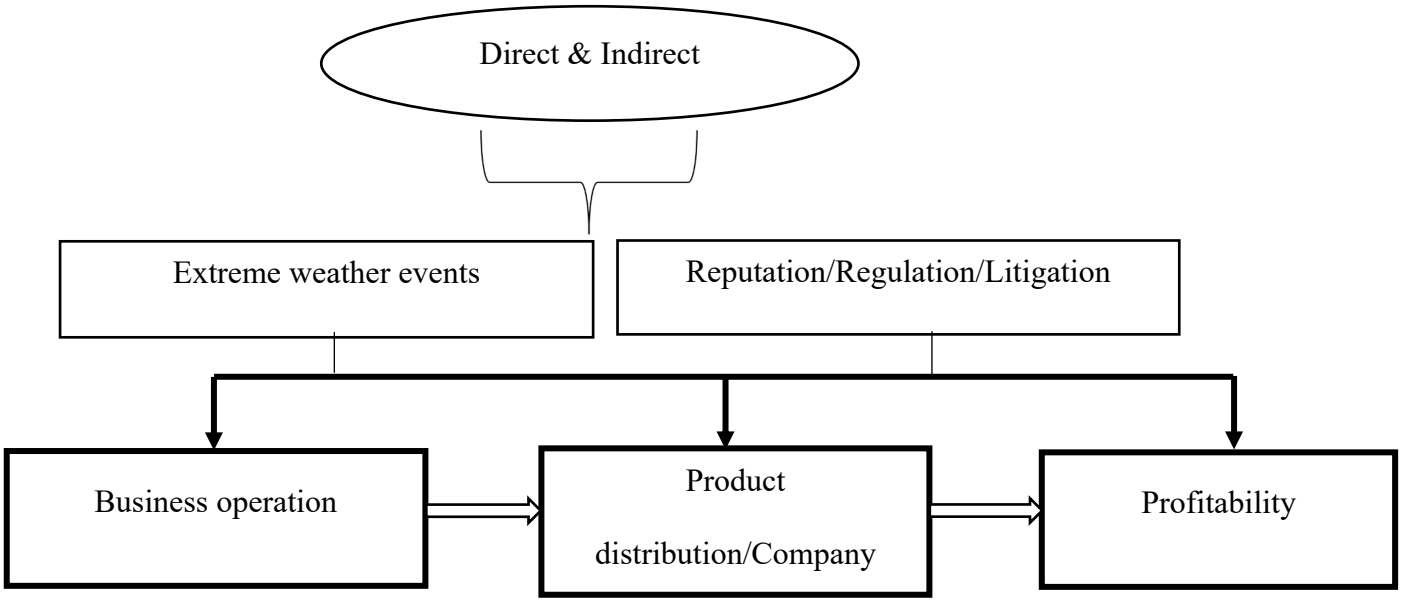

Figure 1: Impacts of Climate Change on Businesses

(Source: Author's construct)

Figure 1 summarizes the direct and indirect impacts of climate change discussed in this section and the potential consequences on companies. Climate change impacts companies' operations, affecting their continuity and overall profitability in the short and long run.

2.4. Business Responses to Climate Change

It has been established from the literature that the business community is not oblivious to climate change. The question then is how are businesses responding to the changing climate? The activities of some firms and industries are carbon-intensive, which emits significant amounts of greenhouse gases into the atmosphere causing climate change. That said, businesses should not be left out in terms of searching for climate change solutions. Rothenburg and Levy (2012) suggested that companies possess valuable financial and technological resources to combat climate change.

In this section, the literature related to how climate change has shaped business responses and actions is discussed.

2.4.1. Businesses and Climate Change Adaptation

Climate change adaptation is the most effective way of dealing with the changing climate; hence planning and research have been directed towards this course to promote its implementation (Agrawala et al., 2011; West and Bianchi, 2013). Businesses have played a significant role in addressing climate change by putting in place measures to reduce greenhouse gas emissions and comply with climate change policies (Pinkse and Gasbarro, 2019). Indeed, corporate actions are mainly geared towards climate change mitigation instead of adaptation – which is the opposite of governments' climate change actions (Linnenluecke & Griffiths, 2010; Pinkse & Kolk, 2012; Sussman & Freed, 2008; Tashman et al., 2015). It is not shocking to see more firms engaging in climate change mitigation because an appreciable number of regulations and global attention reduce greenhouse gas emissions and decarbonize our economies (Ng et al., 2018). West and Bianchi (2013) defined climate change mitigation in the corporate context as measures to reduce atmospheric greenhouse gas emissions, while adaptation refers to a change in behavior to limit present and anticipated effects of climate change to increase firm's value.

Firms are fundamental spaces in which adaptation can occur, regardless of the evolving challenges (Berkhout, Hertin, and Gann, 2006). The involvement of businesses in climate change adaptation is still developing (Linnenluecke et al., 2013; Gasbarro and Pinkse, 2016) and should be further investigated. The growing interest in businesses adapting to climate change has been attributed to two main points. The first point relates to insufficient resources and capacity of countries (especially developing countries) to deal with climate adaptation costs (OECD, 2015; UNEP, 2014). This challenge necessitates the involvement of the private sector (companies and

businesses) and non-governmental organizations in climate change adaptation actions. Secondly, climate change brings business risks like "extreme weathers, raw material shortage, and tougher regulation as well as opportunities for investments in delivering climate-proofing products, services, or infrastructure" (Islam and Mohd-Nor, 2018, p. 41). Businesses are always concerned about their resilience in order to remain profitable, so they adapt when confronted with climate change risks and exploit potential opportunities.

According to Agrawala et al. (2011), concrete evidence on corporate climate change adaptation is murky; hence it is challenging to state that companies adapt to climate change. In their paper, the authors attributed this to three reasons, but the first two are most striking and thoroughly explained. The first one is that companies do not characterize their efforts to manage climate risks and improve environmental resilience as climate change adaptation but rather as a standard risk management process (Weinhofer and Busch, 2013). This relates to the risk management perspective of organizational adaptation (see Islam and Mod-Nor, 2018). The second reason is that businesses are not motivated to express their actions as climate adaptation because the benefits of adapting to climate change favor corporations more than the public in terms of corporate social responsibility (CSR), hence their reluctance to communicate climate adaptation actions. These two compelling points analytically speak to the commonality of maintaining a good reputation – which is a crucial strategy for the business community. This corporate behavior is deemed a business-as-usual approach in dealing with climate change which, according to Linnenluecke et al. (2012), will not suffice in our bid to end the climate crisis.

However, evidence suggests that firms partake in "crisis adaptation," mainly due to extreme weather events (Caring for Climate, 2015; Hall, Berkhout, & Douglas, 2015). Other studies have developed corporate adaptation strategies through frameworks (e.g., Linnenluecke & Griffiths,

2010; Linnenluecke et al., 2012; Winn et al., 2011) and empirical evidence (Scott & McBoyle, 2007; Tashman & Rivera, 2016; Weinhofer & Busch, 2013). Planning and implementing corporate adaptation strategies is an arduous task for firms and scholars to understand (Berkhout, 2012; Pinkse and Gasbarro, 2019). Gasbarro and Pinkse (2016) summarized several studies on corporate climate change adaptation by highlighting the factors (i.e., awareness, vulnerability, uncertainty, adaptive capacity, organizational capabilities, and location) that drive adaptation actions from firms. These factors may vary from one organization to the other hence one needs to understand the context before designing adaptation solutions. Adapting to climate change is described as a complex process because of climate change uncertainty. This explains why many organizations prefer climate change mitigation to adaptation. Given the seemingly tricky process in adapting to climate change by firms, it can be assumed that certain factors or events may prompt adaptation actions. Smit, Burton, Klein, and Wandel (2000), as cited in Pinkse and Gasbarro (2019), stated:

> Sometimes the stimuli for adaptations are expressed as climate or weather conditions (e.g., annual average precipitation or experienced hourly or daily precipitation), sometimes as the ecological effects or human impacts of the climatic conditions (e.g., drought, crop failure, or income loss), and increasingly as the risks and perceptions of risks associated with climatic stimuli or the opportunities created by changing conditions (p. 335).

Firms will respond to climate change adaptation differently based on specific influences. Agrawala et al. (2011) conducted a study on assessing climate change adaptation in the private sector, revealing that some companies decided not to put measures in place to adapt to climate change, while others chose to implement what Agrawala et al. (2011) described as "no regret" or soft adaptation. For those companies that did not have climate adaptation plans, the primary influence was that climate change did not have significant risks on their operations in the present or near-future, hence their decision not to respond pro-actively. On the other hand, the companies engaged in "no regret" or soft adaptation were doing so only because adapting to climate change

conferred some benefits to their business and improved their resilience to current climatic stress and impacts. This corroborates the fact that firms are likely to adapt to climate change when they are aware of the impacts of extreme weather events and harsh climatic conditions on their businesses' operations and their ability to cope (c.f. Busch, 2011). Gasbarro and Pinkse (2016) held a different view by stating that the physical impacts (extreme weather events) of climate change alone do not cause corporate climate adaptation actions. Still, subjective characteristics play an essential role. This implies that companies' interpretations of climate change impacts and their assessment of vulnerability determine the action to take.

In Gasbarro and Pinkse's (2016) paper, four types of adaptation behavior were identified: pre-emptive, reactive, continuous, and deferred. Pre-emptive adaption occurs when companies are constantly adjusting their operations to anticipated climate impacts. The opposite of pre-emptive adaptation is reactive in the sense that such firms only act after they are impacted by a climatic event. Continuous adaptation happens when climate change adaptation actions are implemented on a regular basis. This is the best approach that companies should employ because it takes a pro-active stance in adapting to climate change. Deferred adaptation behaviour is characterized by waiting or postponing decisions regarding adaptation in anticipation of future climatic events. These behaviours are based on the level of awareness and vulnerability of individual firms concerning climate change risks. According to their paper, firms with high awareness and vulnerability to climate change impacts adopt pre-emptive adaptation, whereas companies with low awareness and vulnerability stick to deferred adaptation. Firms that are highly vulnerable but have low awareness of climate change risks resort to reactive adaptation, especially when hit with an extreme climatic event. Companies with high-risk awareness and low vulnerability practice continuous adaptation. A study conducted by Ng et al. (2016) on some ports in Canada revealed

that most managers were aware of climate impacts such as high storms and winds affecting business activity but had no climate change adaptation plans in place. Reflecting on this study shows a deviation from the ongoing discussion that direct climate impacts lead to a corporate response to adapt – further revealing the complexity of climate change.

To sum up this section, it has been established that literature on corporate climate change adaptation is sparse. Most firms are aware of climate change risks and adopt varied responses to adapt to climate change. The most dominant factor driving some climate adaptation actions by firms is the direct impacts of climate change on businesses' operations, as discussed in the literature. However, firms' subjective judgments of these direct impacts of climate change reveal the different response measures taken to adapt accordingly. Therefore, it is vital to maintain that pro-active corporate climate change adaptation is necessary to ensure an aggregate solution to climate change (see Ng et al., 2016). Nelson and Schuchard (n.d) raised a similar point stating that mining companies need to engage in pro-active climate change adaptation due to three reasons. The reasons are supply of input (such as water and energy) constraints, employee health and safety risks (due to heat exposure from rising temperatures), and difficulty in obtaining and maintaining social license. According to Busch (2011), the foremost step to achieving pro-active climate change adaptation is through knowledge acquisition. Firms need to learn more about climate change risks and adopt mechanisms to counteract the dangers of climate change. Governments also need to provide a conducive environment through policy and incentives for the private sector to effectively engage in climate change adaptation (Islam and Mohd-Nor, 2018). Lastly, adapting to climate change confers some benefits on firms through exploiting opportunities that companies need to take advantage of (IPCC, 2007, p. 869; Busch, 2011; Elijido-Ten and Clarkson, 2017).

2.4.2. Climate Change Risks and Opportunities to Businesses

For businesses, climate change presents itself as both a threat and an opportunity at the same time (Agrawala et al., 2011; West and Bianchi, 2013). In 2006, the World Business Council for Sustainable Development (WBCSD) report titled "From Challenge to Opportunity" highlighted that addressing environmental issues presents a win-win situation for businesses (Philips, 2019). This implies that companies are likely to increase profitability while pursuing environmental sustainability. However, this cannot be said of all businesses because there are different companies in every sector, and each sector varies. For instance, forestry is a sector with various companies such as pulp and paper mills, sawmills, lumber, and logging firms operating within the sector. Climate change is likely to impact forest growth and productivity; hence, reducing the total allowable cut of lumber and logging firms to mitigate climate change could have a ripple effect on these firms' production capacity and profitability, threatening their business. Also, the size of companies within every sector may differ, and each of the firms would have varied experience in terms of climate change risks and opportunities (see Galbreath, 2011). The same applies to other sectors like oil and gas, mining, energy, agriculture, etc. There are no qualms that there is an increasing recognition of climate change risks and opportunities in academic scholarship and industry realms; this section presents some discussion around the subject.

According to a report by IRRC Institute and Trucost (2009), an argument was made that "companies that rely heavily on carbon-intensive operations and supply chains could be most exposed to carbon liabilities. High emitters … could see profits fall unless they profoundly change the goods they produce or how they produce them… Carbon pricing could create opportunities for low-emission companies in carbon-intensive sectors" (p. 9). This is a typical statement highlighting the risk and opportunity associated with climate change for companies that rely

heavily on carbon in their production process. For this research, the risk is defined as any threat related to climate change that could negatively affect a company.

In contrast, opportunity refers to innovative ideas or processes adopted by firms to grow and expand their business due to climate change. In terms of corporate climate change risks, Labatt and White (2007), as cited in Elijido-Ten and Clarkson (2017), highlighted three different but interrelated risks: regulatory risks, physical risks, and business risks. In their paper, regulatory risks relate to the costs to be borne by companies because of regulations and policies (e.g., GHG emissions targets), physical risks are associated with the direct impacts of climate change (e.g., floods, drought, etc.), and business risks are those related to the image of a company and its ability to withstand competition. Implementing government policies by levying taxes on emissions from companies poses a significant business risk (Bui and de Villiers, 2017).

Table 1: Some Examples of Corporate Climate Change Risks and Opportunities

Source	Company	Risks	Opportunities
Sanchez (2016)	Nike	- Floods shut down four factories in Thailand - Increased droughts affect cotton production and price	- Adopts the use of more synthetic materials - Uses recycled polyester and certified Better Cotton
EDRM (2016)	American Airlines	- Affected by regulatory restrictions	- Shifting to the use of new aircrafts that are 20% more carbon efficient
Sarah_me (2016)	Hanes	- Water scarcity affecting raw material supply - Regulatory requirements	- Built a good reputation through a five-year environmental strategy - Saved $23 million in water and energy costs in 2012 through sustainable energy practices
Ev_Benjamin_Brow (2016)	United Parcel Service (UPS)	- Regulatory hurdles to reduce emissions	- Uses alternative fuel sources - Use of truck technology to reduce idling

Jesse (2016)	Tesla	- Increasing pressure to reduce carbon emissions	- Manufacturing electric vehicles, lithium-ion batteries, electric charging stations, and solar panels.
Lefty (2016)	Exxon Mobil	-Affected by carbon taxes	-Investing in infrastructure and facilities to reduce environmental liabilities
Chawla (2016)	General Electric	-Emission reduction regulations -Water scarcity	-Investing in new products (hydropower plants and solar power plants) and services which increased revenue
Hombre (2016)	Verizon Communication Inc	-Changes in temperature affect physical assets - Extreme weather events such as floods, increased winds, and changes in humidity affect underground and above-ground infrastructure. - Regulatory requirements to reduce emissions	-Modernizing equipment to make it more reliable -Training employees to become more responsive to crisis

(Source: Author's construct)

To manage these risks, business corporations need to understand that climate change is a prominent sustainable development issue (Baumgartner, 2014) and should adopt appropriate response measures. On the positive side, several scholars have broadly categorized climate change opportunities to include cost reduction through innovation and efficient production, competitive advantage, lower costs of debt, and equity capital (Elijido-Ten and Clarkson, 2017, p. 1068). Climate change opportunities allow firms to expand their market niche and grow their business (Hoang Duc and Do Ba, 2016). The growing recognition of corporate climate change risks and opportunities has incited reputable agencies like Carbon Disclosure Project (CDP), Global Reporting Initiative (GRI), and Sustainable Asset Management (SAM) to include a discussion on

how companies manage climate risks and opportunities in their assessment of each company. Some scholars have demonstrated that the level of firms' climate change risks and opportunities intersects neatly with companies' strategies. Bui and de Villiers (2017) summarized these linkages as presented in the table below.

Table 2: Nexus between Corporate Climate Change Risk and Opportunity

Risk Level	Potential Opportunity	Strategy
Low	High	Offensive
High	Low	Moderate
Low	Low	Defensive/No action
High	High	Pro-active

(Source: Adopted from Bui and de Villiers, 2017)

Table 2 depicts that high climate change risks and opportunities may induce pro-active response strategies by firms. In contrast, comparatively low climate change risks and opportunities may result in null action by firms.

2.4.3. Businesses' Climate Change Responses and Strategies

Responding to climate change-related risks and opportunities is an arduous task and poses a moral test for firms (Elijido-Ten and Clarkson, 2017). In recent times, the changing societal norms and increasing environmental concerns have forced firms to incorporate climate change into their business strategy. Corporate carbon accounting has become one of the most ordinary ways firms are taking responsibility for reducing their greenhouse gas emissions through voluntary reporting such as the Carbon Disclosure Project (CDP) (Tang and Demeritt, 2018). This new norm emanates from the view that while firms exploit economic benefits through their operations, they need to do so ethically and conform to regulations and social standards (Harjoto et al., 2015). Based on this assertion, Ng et al. (2016), among many others, established that responding to climate change from a corporate perspective is a critical component in business ethics. This view

is nuanced with the concept of corporate environmentalism, which, according to Banerjee (2002), is "the organization-wide recognition of the legitimacy and importance of the biophysical environment in the formulation of organization strategy and the integration of environmental issues into the strategic planning process" (p. 181). This has become very important to the extent that studies are being conducted to elucidate the existing moral and ethical considerations between firms and climate change (Galbreath et al., 2016, p. 217).

Generally, business organizations adopt several approaches to tackle environmental problems, including climate change. Some of these mechanisms are categorized under concepts such as corporate environmentalism, sustainable business practice, corporate social responsibility, and organizational adaptation (Islam and Mohd-Nor, 2018, p. 43). Wright and Nyberg's (2017) study highlighted exciting findings on how five major Australian companies responded to climate change over ten years by identifying two main activities: purification and dilution. Both terminologies explain the relationship between climate change and strategies adopted by the case study organizations in their operations. According to their study, purification relates to procedures adopted by an organization to increase profitability and returns while 'overlooking' the company's climate change commitments. On the other hand, dilution emphasized strategies to incorporate climate change concerns within a broader scope than economic maximization. Some examples from Wright and Nyberg's study are: one sustainability manager indicated that their company needed to link strategies to the financials and disassociate from industry bodies around climate change (purification). In contrast, another manager showed that more investment was channeled into research and development to reduce their environmental footprint (dilution).

The above examples portray the morality and ethical considerations of some companies in terms of climate change – and according to Wright and Nyberg's (2017) study, responses are

usually translated into business-as-usual. This questions the efficacy of corporate climate change responses since some firms' emission reduction rates have slowed (see Tang and Demerrit, 2018). Some scholars have attributed this trend to what is termed as 'green-washing.' The term refers to activities by firms to "gain or extend legitimacy, to maintain its level of current legitimacy, or to repair or defend its lost or threatened legitimacy" (O'Donovan, 2002, p. 349) mainly with an outward-looking focus. Furthermore, Rahman et al. (2015) defined it as "the act of misleading consumers regarding the environmental practices of a company or the environmental benefits of a product or service" (p. 1056). In the bid to please and influence the perceptions of shareholders and external stakeholders, companies tend to save their overall image through selective reporting of short-term positive environmental performance, downplaying critical ethical considerations (Tang and Demerrit, 2018) such as climate change, whose impacts project well into the future.

The early part of this section highlighted that carbon reporting is one way companies account for their greenhouse gas emissions. The rationale being that companies will be pushed to mitigate climate change by reporting carbon emissions publicly. Due to this, several carbon reporting schemes, both voluntary and mandatory, have been designed worldwide to encourage companies to report their emissions (Green, 2010). The most popular of these reporting schemes is the Carbon Disclosure Project (CDP), established in the year 2000 to "collect information from participating firms on their climate-change-related risks and opportunities, GHG emissions and climate change management systems and processes on behalf of its 800+ institutional investor signatories" (Matisoff et al., 2013; Tang and Demeritt, 2018, p. 440). In the UK, it is mandatory for all companies listed publicly on the London Stock Exchange Market to report their carbon emissions since 2013.

Knox-Hayes and Levy (2011) stated that one of the reasons companies report their carbon emissions is financial. According to Tang and Demeritt's (2018) study, companies realized a direct connection between the cost of energy usage and emissions by stating that increasing emissions had a resultant increase in expenditure on energy; hence carbon reporting helped companies monitor their progress and reduce emissions appropriately. For other firms, reporting carbon emissions instills confidence in the organization and helps build the company's reputation (Hoffman, 2005). This was also evident in Tang and Demeritt's (2017) study. Some firms viewed carbon reporting as an opportunity to explain the increase in energy usage and emissions to stakeholders. Also, this helped companies to match up competition from companies partaking in voluntary carbon reporting. The same study also revealed that regulations are a significant driver for corporate carbon reporting. Critically assessing the above reasons, it is fair to say that the motivation for reporting emissions by some companies is only loosely associated with concern for climate change and more with business continuity and growth – rounding down to the business-as-usual approach.

Studies on business strategies concerning climate change have recently grouped corporate actions into two models: typology and continuum (Hoang Duc and Do Ba, 2016). Typology models categorize companies' climate change responses under a theoretical set of interrelated principles. An example of a typology model was conceptualized by Steger (1993) by assessing the risks and opportunities associated with engaging in environmental protection by companies. In this model, four different types of strategies were identified: "offensive (high market opportunities and low environmental risks), defensive (low market opportunities and high environmental risks), innovative (high market opportunities and high environmental risks), and indifferent (low market opportunities and low environmental risks)" (Hoang Duc and Do Ba, 2016, p. 597). According to

this model, firms respond to climate change based on the level of risk and opportunity they are presented with. Bui and de Villiers (2017) suggested that climate change risks and opportunities connect with strategies adopted by firms.

Contrary to a generic categorization of corporate responses, continuum models advocate for a perpetual improvement in environmental strategies by firms (Wehrmeyer 1999; Hoang Duc and Do Ba, 2016). A classic example of this model was proposed by Hunt and Auster (1990), which theorized that there are five main environmental management tiers: beginner, firefighter, concerned citizen, pragmatist, and proactivist. Comparing both models, continuum models are progressive in corporate environmental management hence are prescriptive in nature. While typology models provide a mere categorization of companies' responses without an incentive for improvement thus taking a more descriptive approach.

Some studies have developed typology and continuum models for business response to climate change based on these earlier works. Scholars have categorized business responses into two broad strategies under the typology model, namely market and non-market strategies. Market strategies are measures adopted by organizations to increase value by boosting economic performance in the market in which they operate. In contrast, non-market strategies focus on creating value by enhancing firms' performance outside their traditional market environment (Baron, 1995). Non-market strategies are often employed by organizations to challenge and oppose climate-related regulations (Kolk and Pinkse, 2005). Some examples of non-market strategies include information, financial incentive, constituency building (Hillman and Hitt, 1999), changing expert opinion, and self-regulation (Kolk and Pinkse, 2007). Kolk and Pinkse (2004) proposed that market strategies depend on the strategic intent of the organization and the degree of cooperation. Their study established that the purpose of organizational response to climate change may be either

innovation or compensation. Innovation strategies include process improvement, establishing new markets, and developing new products, while compensation strategies comprise setting emission targets, controlling emissions, supply chain measures, and acquiring emission targets (Hoang Duc and Do Ba, 2016). According to Kolk and Pinkse (2004), companies can employ these strategies either internally (vertical) or co-operating with other organizations (horizontal).

Continuum models developed by some scholars to explain business responses to climate change can be distinctively associated with the salience and prevalence of climate change at the time. Here is why: according to Hoang Duc and Do Ba (2016), scholars in the early 1990s proposed a model that identified a three-stage level of business responses to climate change when the issue was emerging as a topical subject in policymaking. In the model, corporate climate change responses fell within the following categories: defensive, opportunistic, and offensive (Kolk, 2000). These categories were based on businesses' perceptions of climate change and their assessment of market risks and opportunities (see Roome 1992; Rondinelli and Vastag 1996; Steger 1993). However, as the recognition for climate change grew, researchers proposed different models to incorporate the strategies and actions that companies adopted to address the issue. For example, Kolk and Pinkse (2005), in their study of multi-national companies, grouped firms' responses into six classes: cautious planners, emergent planners, internal explorers, vertical explorers, horizontal explorers, and emission traders. Also, Jeswani, Wehrmeyer, and Mulugetta (2008) conducted a study that grouped companies' responses into four categories: indifferent, beginner, emerging, and active. These models have their shortcomings because some focused on only developed countries while others delved into developing and developed countries. Also, many businesses are ranging from small to multi-national companies; hence, these models cannot be generalized across all companies worldwide. In conclusion, several response strategies have been

proposed by scholars under two major models: continuum and typology. These models basically demonstrate whether firms' approach to climate change is pro-active, reactive, or moderate.

2.4.4. Motivations behind Corporate Climate Change Responses

Before delving into the factors that motivate businesses to adopt climate change strategies, it is essential to note that businesses are established purposely for profit. That said, companies will always ensure that actions intended to respond to climate change do not reduce the profitability of their business. The onus then lies on researchers to understand why businesses respond to climate change, because climate change adaptation has been an expensive activity. However, there are just a few studies geared towards examining this subject (Kaesehage et al., 2019). Kang, Yoon, and Rhee (2017) identified that "prior experience with the impact of climate change, concerns about the risks posed by climate change, organizational capacity (leadership, commitment, staff availability), and business size" (p. 389) are significant factors driving climate change actions in the business community. Many studies from the 1990s, including Drabek (1995), Dahlhamer and Reshaur (1996), Dahlhamer and D'Souza (1997) established that companies' experiences with climate change impacts have been an impetus for climate change actions. Akter and Bennett (2011) also tested people's perception of climate change and found that climate change actions are sometimes a result of a genuine concern for climate change. This means that employees' values in a firm can motivate corporate climate change actions (Kaesehage et al., 2014). For instance, a CEO of an organization with a firm conviction of the existence and "wickedness" of climate change will lead the organization to implement measures to tackle the issue.

Organizations that do not have the right leaders, staff, and financial muscle will likely face trouble responding to climate change or may ignore acting (Brody, Kang, and Bernhardt, 2010). This emphasizes the importance of organizational capacity as a significant driver for business

response to climate change. Businesses with a smaller size have a lower and ineffective response regarding climate change than larger businesses (Jo and Nam, 2011). Hypothetically, it can be assumed that larger enterprises have the means (i.e., resources and staff) to engage in climate change adaptation actions. Hence, the size of businesses counts in undertaking pro-active climate change response measures. Another critical factor influencing firms' activities is climate change regulations. Eberlein and Matten (2009) conducted a study on companies in Germany and Canada. They concluded that international protocols, regulatory obligations, and corporate ethical responsibility were significant factors driving climate change actions by the selected firms. Amidst these discussions, scholars like Cohen (2006) have revealed that financial motivation causes businesses to solve climate change problems. This assertion implies that when there is a possible financial benefit accruing to companies due to tackling climate change, there is a high probability of action.

Kaesehage et al. (2019) assessed businesses' motivations concerning climate change responses and identified three types of entrepreneurs: climate opportunists, traditional entrepreneurs, and integrative entrepreneurs. According to their study, climate opportunists are businesses (such as renewable energy firms) whose existence results from climate change. For these kinds of companies, Kaesehage et al. (2019) concluded that their motives for solving climate change are attributed to financial reasons. This is true because they saw an opportunity to gain economic benefits through engaging in climate change solutions and took advantage of it. According to their study, traditional entrepreneurs perceive that climate change has shaped the way business should be done, hence adopting strategies to gain the associated socio-environmental benefits such as good reputation. This presents a different motivation from a purely financially induced response, as in climate opportunists. The last group of companies – integrative

entrepreneurs – are in the middle as far as financial and socio-environmental motivations are concerned. These entrepreneurs are motivated by both economic and socio-environmental reasons without any form of prioritization, leading to a win-win situation (Kaesehage et al., 2019). Based on the above, it is evident that many reasons account for corporate climate change responses ranging from personal to social level. Some of which include personal experiences with climate change, organizational capacity, and financial benefits, etc. These motivations need to be understood by researchers to develop appropriate models and strategies for firms to follow in addressing climate change cumulatively.

2.5. Institutional Theory

To understand business responses to climate change, this research adopts a theoretical approach, institutional theory. It is one of the prominent theories used to explain organizational behavior and change (see Soeiro & Wanderley, 2019). For instance, Sherer et al. (2016) used institutional theory to describe the adoption of electronic health records in the U.S. The idea highlights the relationship between the behavior of organizations and the adoption of certain practices based on norms, rules, and belief systems in an institutional environment (Scott, 1995). According to DiMaggio and Powell (1983), an institutional environment is made up of "those organizations that, in the aggregate, constitute a recognized area of institutional life: key suppliers, resource and product consumers, regulatory agencies, and other organizations that produce similar services or products" (p. 148). An organization's institutional environment moulds its actions and behaviour due to institutional pressures (see North, 1990).

The extant literature on institutional theory proposes that three main institutional pillars – regulatory, normative, and cognitive – are the drivers of organizational change (Scott, 1995). The

regulatory pillar refers to the explicit guidance from authorities which create formal rules for companies to comply (Kostova and Roth, 2002). The normative pillar establishes informal rules as a result of values and social standards in a profession (Scott, 1995). The cognitive pillar relates to the cultural dimension shaping organizational behaviour (Lavandoski et al., 2016). These pillars produce institutional pressures – coercive, normative, and mimetic (corresponding to the above list respectively) – that forces organizations to behave in a certain manner (Lavandoski et al., 2016). Firms make decisions on best-suited practices according to their institutional environment. Essentially, institutional theory provides insights on institution building.

On this premise, Tolbert and Zucker (1983) stated that companies consider the rationality and efficiency of their practices as well as their actions' legitimacy (social acceptability). The implication of this statement relates to the idea of rules and norms in an institutional environment in the sense that organizations will be reluctant to adopt practices that do not conform to the structured rules and norms in their setting. As a result of the pressure to align with existing norms, firms make 'absurd' decisions that the traditional concept of economic efficiency cannot explain (Miemczyk, 2008). In fact, an organization's institutional environment significantly impacts the development of structures even more than market pressures (DiMaggio and Powell, 1983). Sherer et al. (2016) emphasized this point by highlighting that "organizational decisions are not driven purely by rational goals of efficiency but also by social and cultural factors and concerns for legitimacy" (p. 572). According to Rogers et al. (2007), managers are often torn between maximizing economic efficiency and satisfying institutional demands. Having explained that institutional theory provides insights into organizational structure and behavior, this research focuses more on the new institutional theory, also known as neo-institutionalism, which originated from John Meyer and Brian Rowan’s work published in 1977 (Powell and DiMaggio, 1991).

In addition to Meyer and Rowan's article, Zucker's (1977) paper remarkably contributed to the birth of the theory. Six years later, DiMaggio and Powell (1983) published a paper which analyzed the concept of isomorphism – a component of neo-institutional theory. Neo-institutional theory was unpopular until 2010 when it became a dominant theory in organizational studies (Vogel, 2012). The central argument raised by these early scholars was that organizations adopt actions based on sheer legitimacy and not efficiency or effectiveness (Alvesson and Spicer, 2019). The theory proposes that organizational strategies are based not only on logic and economic efficiency but also on decisions embedded in a socially constructive process (Kauppi, 2013). Many studies on neo-institutional theory are primarily geared towards identifying the causes and effects of the observation that organizations operating in the same business environment or industry have certain similarities concerning their form and structure (Chin and Mishra, 2013). For example, Finn, Currie, & Martin (2010) studied how institutions shape the adoption of new managerial techniques in the healthcare sector, Segal & Lehrer (2012) revealed the institutionalization of new teaching philosophies within public schools, Paradeise & Thoenig (2013) examined how universities comply with increasingly institutionalized global standards, and Muzio & Falconbridge (2012) identified the extent to which law firms comply with local standards. Despite the prominence of neo-institutional theory, Alvesson and Spicer (2019) posit that the theory is facing a mid-life crisis. In their paper, they highlighted the problems of institutional theory including over-reach, myopia, tautology, pseudo-progress, and re-inventing the wheel.

The homogeneity of firms as postulated by new institutionalism theory is termed isomorphism, which is defined by DiMaggio and Powell (1983) as "a constraining process that forces one unit in a population to resemble other units that face the same set of environmental conditions" (p. 66). A critique of the theory relates to the focus on homogeneity of firms classified

as isomorphism. Greenwood et al. (2014) highlighted that much emphasis is placed on isomorphism in institutional theory ignoring the apparent heterogeneity of firms, hence the need for redirection. Nevertheless, other scholars hold a contrasting view from Greenwood et al. For instance, Meyer and Hollerer (2014) did a close analysis of the arguments raised by the critiques and concluded that "a focus on differences and heterogeneity as well as an underestimation of similarities and homogeneity is, in our opinion, at risk of deflecting attention away from institutions……. and we see neither need nor urgency for redirection" (p. 1231). The authors suggest that isomorphism conceptualized in institutional theory is still relevant and grounded in organization theory.

Isomorphism is portrayed in three different dimensions: coercive, mimetic, and normative isomorphism (Sherer et al., 2016). These three types of isomorphism are forces shaping organizational structure and form. According to Chin and Mishra (2013), coercive isomorphism typically emanates from pressures given to businesses by society and organizations that have the authority to keep those businesses in check. In other words, Powell and DiMaggio (1991) argued that regulatory requirements imposed by governments play an instrumental role in influencing the change and behavior of firms. For example, regulations mandating firms to reduce greenhouse gas emissions can pressure firms to engage in carbon accounting and reporting to help keep track of their emissions. In the long run, as firms continue to account for their carbon footprint, the government regulations legitimize and institutionalize this process which leads to a norm across the industry (c.f. Meyer and Rowan, 1977). Multi-national corporations that are very powerful can also induce some form of coercion on partners to adopt strategies to satisfy their ulterior motives (Liu et al., 2010).

Government regulations alone cannot be the only force behind firms' homogenization, hence other isomorphic pressures. It has become common that firms copy successful strategies from their counterparts in a business environment, representing mimetic isomorphism (Chin and Mishra, 2013). A typical example is the publication of sustainability reports by firms. Environmental sustainability has become topical in recent times, and businesses are deemed vital in achieving this goal. In the bid to demonstrate their contribution to this objective, firms publish reports on their website outlining plans and actions that have been taken. This approach is less risky because firms do not have to implement new strategies that may be costly but rather imitate what other firms are doing (Miemczyk, 2008). Also, adopting similar actions of other firms can increase social acceptability because the public may already be used to such a pattern, thus trusting the imitating organizations even more.

Lastly, normative isomorphism stems from actions adopted by firms through professional links and networks that conform to the rules and norms of the industry in question (Sherer et al., 2016). Powell and DiMaggio (1991) argued that normative isomorphism is nuanced with the concept of professionalization, which Chin and Mishra (2013) defined as the "collective struggle of the members of an occupation to define the condition and methods of their work so that there is a clear, established cognitive base and legitimization for occupational autonomy" (p. 291). Studying the definition highlights the formation of an isomorphic pattern due to discussions on norms and rules guiding the profession. In reality, an association like Newfoundland and Labrador Forestry Industry Association is a platform where professionals in the forest industry can propose and discuss standards that will bind firms in the sector. Professional and trade associations are common avenues for developing and implementing norms and rules specific to an industry (Chin and Mishra, 2013).

However, Scott (1987) highlighted that there are variants of the neo-institutional theory that cannot be overlooked. The two major arguments surrounding neo-institutional theory are sociological (DiMaggio and Powell, 1983) and economic (e.g., Haunschild and Miner, 1997) perspectives. Mimetic, coercive, and normative forces, as explained above, are associated with the sociological viewpoint. The economic outlook stresses similar actions adopted by organizations that are purely driven by financial motives. According to Haunschild and Miner's work, the economic aspect of isomorphism is demonstrated in three ways: frequency, trait, and outcome based. Frequency refers to the adoption of similar actions that a significant number of firms have previously implemented. An example is the standard practice of firms engaging in voluntary certifications. According to Kauppi (2013), frequency-based imitation is usually done unconsciously without careful consideration, hence it is taken for granted. Trait-driven imitation is when organizations copy from others based on selected traits like performance, company size, and prestige (Haunschild and Miner, 1997). An example is organizations copying practices from the top 10 companies in the world. Huang et al. (2010) added that trait-based imitation could also happen by mimicking organizations in the same industry or region. Lastly, outcome-based replication occurs when an organization implements a successful practice by another company. For example, other automobile companies are likely to copy Tesla, an automobile company producing electric vehicles and other sustainable products with great success in this area. Huang et al. (2010) describe this as benchmarking where companies look up to other leading organizations in their market.

Despite the existence of both arguments, they both boil down to institutional isomorphism. A common similarity of the two variants of the theory is uncertainty (Kauppi, 2013). When an organization is uncertain about what action to take during challenges, they quickly imitate similar

practices from other firms. The trend is that when uncertainty is high, sociological isomorphism becomes more prevalent as compared to economic imitation (Haunschild and Miner, 1997). This confirms Galaskiewicz and Wasserman's (1989) argument that making decisions in an uncertain environment is primarily influenced by mimetic, coercive, and normative forces. Given the myriad of uncertainties associated with climate change, this study assumes that some of these isomorphic forces will partly drive some business responses. Also, it is widely accepted that applying different theories from other fields enriches and provides a broader scope to a particular discipline (Koulikoff-Souviron and Harrison, 2008). Because of this, institutional theory (borrowed from organizational change and management literature) offers excellent potential in explaining the business and climate change nexus (see Figure 2 below).

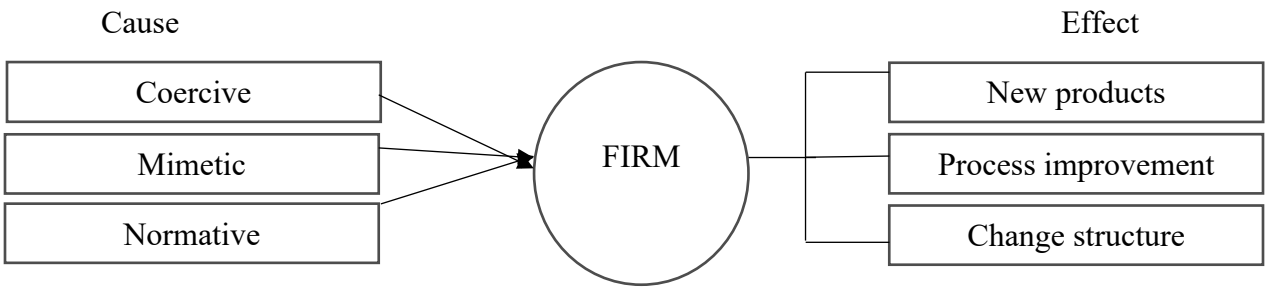

Figure 2: Isomorphic Forces and Corporate Climate Change Responses
(Source: Author's construct)

Figure 2 illustrates how the three institutional isomorphic pressures can shape corporate responses to climate change. It has been established that companies respond to climate change by being innovative through developing new products, changing production processes, and shifting organizational structure. However, this research seeks to examine whether the isomorphic forces play a role in either mitigating or adapting to climate change, leading to a cause-and-effect relationship as shown above.

To contextualize this relationship, it is prudent to demonstrate how the literature on climate change has used institutional theory to explain corporate practices. It is common knowledge that many companies are involved in GHG emissions reporting to measure their carbon footprint and reduce the impacts of climate change. GHG emissions reporting has been standardized by using guidelines from bodies such as Global Reporting Initiative (GRI) and the GHG protocol to measure and report GHG emissions (Chatterjee, 2012). According to the GHG protocol, companies' GHG emissions reports should reflect their actual emissions. In achieving this, companies must follow five main principles: relevance, completeness, consistency, transparency, and accuracy (Comyns, 2018). Furthermore, the protocol recommends that "standardized reporting formats be used to ensure that data received from different business units and facilities [are] comparable, and that internal reporting rules are observed [so that] standardized formats can significantly reduce the risk of errors" (World Business Council for Sustainable Development (WBCSD) & World Resource Institute (WRI), 2004, p. 45). This makes GHG emissions reporting a standard practice that most businesses have adopted across various sectors.

A significant reason why most companies follow these standardized guidelines is that countries such as U.S., Canada, and Australia have made emission reporting mandatory through regulations (KPMG et al., 2016). Mandatory emission reporting will force firms to follow the given guidelines, leading to isomorphism caused by regulations (coercion). Also, when there is a massive concern for climate change in the environment in which firms operate, they feel pressured to report their emissions (Comyns, 2018). The pressure from society will force firms to ensure that actions to respond to climate change are legitimate (Comyns, 2018). Legitimacy concerns are potential causes for mimetic and normative isomorphisms. Because, in responding to external pressures, firms may adopt similar practices from organizations that have already gained social acceptability.

Hypothetically, this research is based on the general perspective of neo-institutional theory in identifying the isomorphic forces influencing corporate climate change actions and the associated strategies adopted in the natural resource sector of Newfoundland. Meyer and Rowan (1977), as cited in Chin and Mishra (2013), suggested that "organizations do not rationally structure and organize their processes in response to environmental pressures; rather, they tend to respond in a similar manner to the same social forces to which they are exposed, thus developing similarity in both structure and form" (p. 290). As climate change persists as an environmental problem with continuous pressure from society for businesses to act, it can be assumed based on Meyer and Rowan's (1977) work that companies in the natural resource sector are likely to adopt similar practices and responses, moving towards isomorphism over time. Furthermore, this thesis appears to be novel in applying institutional theory to climate change responses in Newfoundland's natural resource sector.

In conclusion, neo-institutionalism is a valuable theory that explains corporate behavior and explores the patterns evolving from organizational change. A component of the theory labelled isomorphism explains how firms become similar or adopt similar practices over time, which legitimize their actions. As climate change continues to be a topical issue, businesses have a role to play to end the climate crisis. However, academic literature shows that corporate actions are not sufficient to eliminate the problem. This calls for the need to investigate all aspects of the issue, thus examining corporate actions regarding climate change is necessary. In doing this, the research seeks to identify whether some of the corporate climate change responses intersect with the concept of isomorphism in institutional theory.

CHAPTER THREE: RESEARCH DESIGN

3.1. Introduction

Conducting a study on an environmental problem or any issue requires adopting processes and approaches that will facilitate an understanding of the subject and help provide practical solutions. For this reason, the study followed a qualitative research approach in finding answers to the research questions highlighted in Chapter 1. This chapter aims to provide a contextual background for this research and describes the methodology utilized in the entire study. The various sections in this chapter in the order in which they are presented include: an introduction, importance of Newfoundland and Labrador's natural resource sector, summary of climate change impacts on Newfoundland and Labrador's natural resource sector, research design and justification, research approach, methods, and limitations of the study.

3.2. Importance of Newfoundland and Labrador's Natural Resource Sector

The province of Newfoundland and Labrador is endowed with a variety of rich and natural resources. To mention just a few, they include oil, gas, wind, hydro, forests, and minerals such as iron ore, nickel, copper, zinc, gold, etc. There are four major offshore oil extraction projects in the province: Hibernia, Hebron, Terra Nova, and White Rose. Aside from these major projects, the government of Newfoundland continues to explore oil reserves and has committed $4 billion to this course as of January 2021 (Government of Newfoundland and Labrador, 2021). The abundance of these energy resources enables the growth of the province's economy and meets energy demands both inside and outside the province. According to the government of Newfoundland and Labrador, the province is among the largest producers of electricity and

petroleum across the globe on a per capita basis (Government of Newfoundland and Labrador, 2021).

Moreover, 56% of the island of Newfoundland consists of forests, with a vast majority of the forests considered productive (Heritage Newfoundland and Labrador, 2015). The fertile forests in Newfoundland are in the valleys of the Churchill, Kenamu, Eagle, Hawke, Alexis, and Kaipokok Rivers. The boreal forests of Newfoundland span an area of over 23 million hectares and provide resources to significant industries such as pulp and paper mills, integrated sawmills, and value-added manufacturing (Allen, 2021). The forest resources in Newfoundland have played a significant role in the history and civilization of the province and continue to contribute to the province's economy. According to Heritage Newfoundland and Labrador (2015), forest resources provide the primary product (wood) for constructing dwellings, storehouses, and containers for people in the early centuries. Additionally, in the past, wood from the forests supported the province's principal economic activity – fishing – in the construction of boats, flakes, and barrels. In modern times, the commercial use of wood products has further placed enormous economic value on forest resources.

The natural resource sectors have been fundamental to the development of Newfoundland, which necessitates paying careful attention to the growth and sustenance of these industries. According to a recent report released by the Government of Newfoundland and Labrador, agriculture, forestry, mining, and oil extraction contribute 27.2% of the entire GDP of the province (Government of Newfoundland and Labrador, 2021). These industries also employ many local people. For example, the oil and gas industry employed 4000 people in 2020, while mining employed 6739 people in the same year (Government of Newfoundland and Labrador, 2021). In the forest industry, lumber production increased to 100 million board feet in 2020, which helped

meet the local demand for home improvements in the province and increased the export of lumber to the U.S. (Government of Newfoundland and Labrador, 2021). The highlighted benefits of the natural resource sectors indicate how relevant they are to the economy of Newfoundland and Labrador. Based on the above, the economy of Newfoundland and Labrador – which is dependent mainly on natural resources – can be strengthened when all the natural resource industries are given the necessary support to operate efficiently under a conducive environment.

3.3. Summary of Climate Change Impacts on Newfoundland's Natural Resource Sectors

Having established that the resource sectors of Newfoundland are critical to the economic growth of the province, it is necessary to reveal how climate change impacts their productivity – which is likely to slow the progress of their development and management. It is common knowledge that climate change poses a challenge to resource management and development; hence, understanding its impacts can limit some of the dangers it may cause in both the present and future. This section summarizes the effects of climate change on natural resources (focusing on forestry, mining, and oil and gas) in Newfoundland to help inform management decisions and adaptation actions from organizations and companies working within these sectors.

First, a significant effect of climate change is increasing air temperatures across the globe, including Newfoundland and Labrador. This increase in temperature, sometimes called global warming, can cause forest fires in the province. The government cannot ignore the possibility of witnessing this impact in Newfoundland because it is already evident from the forest fires in Australia and British Columbia. Catto's (2010) paper highlighted that climate change had induced forest fires leading to changes in forest distribution in the province. Also, a decrease in summer precipitation caused by climate change affects the growth of trees with shallow roots like spruce,

and in some cases may lead to the death of specific tree species in Newfoundland (Catto, 2010). Studies have confirmed that climate change may lead to increase variation in forests, posing a challenge to forestry management (see Catto, 2010). This means that some tree species in their desired locations will be destroyed making room for new species thus altering the natural setting. In Newfoundland and Labrador's forest industry, specific challenges related to climate change will be forest migration and increased susceptibility to droughts and forest fires (Allen, 2021). Also, Natural Resources Canada (2009), as cited in Allen (2021), asserts that climate change increases the risk of invasive species, pests, and diseases on forest growth. As Newfoundland possesses much forested land, the government must reduce or avoid the dangers posed by invasive species to forestry in the province. Based on the evidence and reality of climate change's effects on forestry, the Canadian Council of Forest Ministers has recognized this as a severe issue. It has been proposed that climate change adaptation in forestry should be a priority in Canada (Allen, 2021).

Newfoundland derives most of its electricity from hydropower generation. Hydro is a renewable natural resource sensitive to the climate; hence, it can be impacted by climate change. Changes in overall annual precipitation may affect the generation of electricity in the province. This is because low precipitation results in reduced streamflow and increased evapotranspiration, thus reducing electricity generation in Newfoundland (Catto, 2010). Also, transmission lines that distribute power across the province may be damaged because of ice storms and strong winds caused by climate change (Catto, 2010). Hypothetically, storms can have a potential impact on the oil and gas sector as well. Some of the effects may include damage to infrastructure and a halt in offshore oil extraction and drilling activities. According to Nelson and Schuchard (n.d) disturbance to mine infrastructure and operations was reported as the major impact of climate change on mining companies. There is the tendency that mining firms in Newfoundland and Labrador would

face such an impact. Reflecting on the importance of the natural resource sectors in Newfoundland, climate change adaptation actions must be implemented to derive the inherent economic benefits. However, a significant observation from writing this section was the lack of academic literature on climate change impacts for Newfoundland's natural resource sectors – especially mining. Also, government reports and research barely focused on this subject, implying a need for a shift in policy and research direction.

3.4. Research Design and Justification

Scholars such as Blaxter et al. (2006) have argued that research questions, purpose, and timing, among other factors, comprise the research design. Based on the above, this thesis adopted a qualitative research approach (Marshall & Rossman, 2014). Qualitative research design, according to Creswell (1994), is "an enquiry process of understanding a social or human problem, based on building a complex, holistic picture, formed with words, reporting detailed views of informants and conducted in a natural setting" (p. 2). Considering the objective of this study, which is to appreciate business responses to climate change, the adoption of a qualitative research approach is not far-fetched and matches cleanly with the research purpose. This is because qualitative research is most appropriate for exploratory open-ended questions when describing the case/problem richly is more important than looking for quantitative patterns or rules across cases (6 and Bellamy, 2012) The implication is that the methods for data collection and analysis are also qualitative. For this study, interviews and publicly available documents were used in collecting data for the research. Interacting with stakeholders and actors (interviewees) helps the researcher to appreciate the processes and intricacies of the issue in suggesting policy recommendations – which is a crucial feature of qualitative research (Flick, 2014).

3.5. Research Approach/Methodology

Research questions are essential and cannot be underestimated when pursuing a research project. According to Agee (2009), “good questions do not necessarily produce good research, but poorly conceived or constructed questions will likely create problems that affect all subsequent stages of a study” (p. 431). In most cases, research questions are developed through an interest in a particular field or intellectual curiosity (see Agee, 2009). This means that research questions are the beginning point of inquiry (Agee, 2009). For this reason, this study adopted an overarching question (how are businesses responding to climate change?) to help provide insight into the topic. It is important to note that the research questions have determined the approach of this study. Descriptive questions are asked when the researcher is uncertain about an empirical topic, while explanatory questions explain relationships between two different research variables (6 & Bellamy, 2012). In general, descriptive questions describe a particular issue, while explanatory questions identify factors influencing the case and explaining the connection between them. “What” and “why” questions are classified as descriptive and explanatory questions, respectively. "What are the companies' perceptions" and "what are the organizations' responses" are descriptive questions while "to what extent have isomorphic forces influenced the companies' actions" is an explanatory question. The research questions were designed to gather necessary basic information about the issue (i.e., the two descriptive questions) and then to understand the underlying causes (i.e., the explanatory question) to facilitate recommendations and lessons.

This study adopted an inductive research approach by asking open-ended questions without predicting the outcomes (6 & Bellamy, 2012). The implication is that no hypothesis or assumptions were made in developing the research questions. The goal was to seek an exploratory endeavour regarding this research. Although utilizing the concept of isomorphism could connote a

"prediction," it was not necessarily directly tested. Rather, the researcher expected to find it as a potential influence on companies' responses. The inductive research approach usually pairs with a small-N study in finding answers to the research question (see 6 & Bellamy, 2012). The purpose of using a small-N study is to provide the researcher with rich and detailed information on the research topic. Furthermore, a single case study of resource industries in Newfoundland was used to contextualize the research and to answer questions for this thesis.

To justify the use of case study approach, the features or elements of this approach are highlighted briefly here. Researchers have recognized the use of case studies in research as an "empirical inquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident" (Yin, 2003, pp. 13-14). An element of the case study approach in research is the interaction between individuals (or groups of individuals) and the researcher in finding answers to the research questions (Starman, 2013). Also, case studies are suitable for answering "what," "how," and "why" questions (Yin, 2003). The focus of this thesis was to investigate how businesses are responding to climate change. In doing so, the researcher narrowed the scope of the study by selecting what kind of businesses in what locations should be included in the study. This necessitated using a case study to make sense out of the questions that needed to be answered. To narrow down the research, a conclusion was made by choosing natural resource companies in Newfoundland as a case for the study. Eight companies from mining, oil and gas, and forestry sectors were used for the study (see Table 3 below). Such an approach was appropriate in gaining insight into the topic concerning the selected case. Lastly, due to the relevance of the natural resource sector in Newfoundland and the sparse literature surrounding climate change in this sector, the chosen case study was presumably the best fit for this thesis.

3.6. Methods

3.6.1. Data Collection

After designing the research, another critical phase in the research process is collecting and analyzing data effectively. It has been established that this study adopted a purely qualitative research approach; hence, both data collection and data analysis conform to this approach. Given this, eight interviews were conducted by the researcher from March to early June 2021 – representing the primary source of data collection. Researchers have different opinions on what number of interviewees is preferred for a study. In quantitative data collection methods, the sample size, calculated by different mathematical formulae is considered essential in making general conclusions from the data. However, qualitative research takes a different approach by emphasizing saturation (see Malterud, Siersma, & Guassora, 2016). Saturation refers to a point in the data collection phase where information given by research participants becomes similar to and, for the most part, a repetition of previously collected data (see Fusch and Ness, 2015). At this juncture, a researcher can end the data collection process and begin with the analysis. That said, this research aimed at conducting 10-15 interviews to paint a clear picture of the findings given the available resources and time. However, only eight interviews were conducted (see Table 3), representing a significant limitation of the study.

Table 3: List of Selected Companies

Name of Company	Respondent
Firewood Co	Interviewee 1
Oil and Gas Co 1	Interviewee 2
Mining Co 1	Interviewee 3
Mining Co 2	Interviewee 4
Pulp and Paper Co	Interviewee 5
Oil and Gas Co 2	Interviewee 6
Mining Co 3	Interviewee 7
Mining Co 4	Interviewee 8

(Source: Author's construct)

From Table 3 above, two companies represented the forest industry, four firms the mining sector, and two companies the oil and gas sector. One of the forestry companies sells hardwood to its customer base and the other manufactures newsprint and other paper-related products. The mining companies focus on the mining of gold, copper, iron ore, and fluorspar. Lastly, the oil and gas companies deal in the exploration and drilling of oil and gas in the offshores of Newfoundland.

Before initiating the investigation, the researcher applied to the Grenfell Campus Research Ethics Board (GCREB) for clearance to pursue the investigation because the research involves human participants. After receiving ethics approval in February 2021, the researcher had preliminary conversations with people who have a fair knowledge (key informants) of the natural resource sector in Newfoundland. The reason for using this process was to solicit ideas, suggestions, and possible contacts in companies regarding the research topic (see Payne and Payne, 2004). Concerning potential companies to include in the study, the researcher considered natural resource companies in Newfoundland as a population sample. However, convenience and snowball sampling were used in recruiting participants who happen to be managers, CEOs, presidents, and supervisors in companies. Convenience sampling was used to recruit easy-to-reach participants, while snowball sampling was employed to recruit participants through recommendations and referrals by other interviewees. Snowballing complemented convenience sampling because it allowed the researcher to interview people who may not have been captured through the latter (Abdulai, 2018). Email addresses of interviewees were obtained online from companies' websites and public directories.

Primary data collection for this research was done remotely due to COVID-19 restrictions. Over 30 emails were sent to potential participants in various companies as an invitation to contribute to the study by accepting to participate in an interview. A follow-up email was sent after

a week to confirm the receipt of the email and as a reminder to respond. After three months, only eight participants responded positively with interest to participate in the research. The researcher acquired oral and written informed consent before beginning an interview. Participants were provided with a brief background of the study and assured that there were no undue risks involved and their confidentiality/privacy would be securely protected. Semi-structured interviews were the main source of collecting primary data because they provide in-depth information on a subject and are the most popular method for collecting qualitative data (Silverman, 2016). These help the researcher seek clarification on issues during the interview and give the interviewees the freedom to express themselves freely without necessarily following a structured format.

Although face-to-face interviews are deemed the best way to capture an interviewee's emotions and experiences (Rowley, 2012), the researcher employed phone calls in interviewing participants for the sake of applicability. Interviews were designed to last for 30-60 minutes to ensure that participants would not be discouraged from partaking in the interview. The audio of the interviews was recorded, and there was no instance where a participant preferred to speak off the record. Finally, secondary data sources were also collected from companies' websites and through literature as an additional source of information.

3.6.2. Data Processing, Presentation, and Analysis

Data collected for this research passed through three stages: editing, organizing, and analysis. All interviews were assigned generic names such as Interviewee 1, Interviewee 2, Interviewee 3…., etc. Audio recordings of interviews were securely transferred and stored on a password-protected laptop for transcription purposes. The recordings were then transcribed in June with the help of the "Dictate" function in Microsoft Word. The transcribed files were edited manually by cross-checking the transcripts with the recordings. The transcripts were then

organized by identifying themes pertinent to the research questions. This process is termed as qualitative coding (Abdulai, 2018). At this stage, the researcher read through all the transcripts and highlighted texts with specific colors related to a particular theme with respect to the research questions. For example, texts in the transcripts associated with climate change impacts were highlighted with a red color, while climate change responses were highlighted in yellow. The coding process helped organize the transcripts into various themes pre-determined by the researcher and revealed other emerging themes from the data.

Two qualitative techniques were used for data analysis, namely thematic and content analysis. Essentially, thematic analysis constitutes the process of coding the data into themes. It is defined as "a method for identifying, analyzing and reporting patterns within data" (Braun & Clarke, 2006; p. 79). The researcher read the transcripts and other documents on the companies' websites to familiarize with the information embedded in the transcripts and make sense of the data. To answer the research questions, the emerging themes were first categorized. After categorization, themes were presented inductively by inferring from the data with respect to the research questions. On the other hand, content analysis was used to interpret the data by using the utterances of interview respondents. Points made by respondents were described by using direct quotations. The use of quotes helped reiterate the participants' voices. The researcher benefitted from direct quotations by adding quality and validity to the substance of the data analysis presented in this thesis. Collectively, thematic analysis helped in grouping the data into themes whereas content analysis allowed the researcher to give a verbatim account of interviewees' responses.

3.7. Limitations of the Study

No matter how organized and planned a researcher may be, we acknowledge that certain limitations may hinder the progress of research. As this section is being written, it is not surprising

that many researchers have been impacted by the COVID-19 pandemic, which was officially confirmed in March 2020 in Canada. This research was conducted amidst a global pandemic, which posed a limitation to the study. Before the pandemic hit, the researcher aimed to meet participants for face-face interviews and observe companies' operations during a site visit. This would have allowed the researcher to ask questions based on specific observations to provide additional information for the research. But due to lockdown measures on account of COVID-19, all interviews were conducted remotely through phone calls. Also, most companies resorted to working from home while others reduced their hours of operation. This affected the research because most of the emails sent out to potential participants received no response accounting for the low response rate of this research.

At the end of the data collection phase, a targeted response of 10-15 interviews was not achieved. Resultantly, generalizing an idea or issue became a bit tricky and required the use of carefully selected words. Furthermore, because employees were working from home, some participants had divided attention and, on several occasions, asked the researcher to repeat questions which, to an extent, affected the quality of collected data. However, the fact that data was collected and transcribed by the researcher himself, there was a possibility that data loss was minimized throughout the interviews.

CHAPTER FOUR: RESULTS AND DISCUSSION

4.1. Introduction

This chapter presents the findings of the research concerning the questions of inquiry. The data collected from the interviews are discussed and interpreted as they relate to the research questions. The researcher sought to make sense of the data collected, which is the main thrust of data analysis (Grolemund and Wickham, 2014). Essentially, this chapter aims to draw meanings from the data collected and compare them with literature on the subject. The chapter ascertains whether the findings from the study corroborate with existing research on the topic or reveal novel themes that other scholars can further explore.

4.2. Perceptions of Climate Change: An Organizational View

Setting the background for this section in Chapter 2 of this thesis, the researcher explored the various corporate perceptions of climate change to answer the first research question: What are the selected organizations' perceptions of climate change?

One of the significant discussions surrounding climate change is the tension between belief in and denial of a changing climate – across academia, industry, and government jurisdictions. To satisfy the researcher's curiosity on the issue, representatives from the selected organizations in this study were asked to give their opinion on the subject. Upon analyzing the responses, it was fair to conclude in general that all the selected companies believed in the existence of climate change and were aware of the impacts that it could have on human society. For instance, this is what a respondent from a firewood company had to say about the issue: "Of course, climate change is definitely happening, and given my environmental background, it is always in my mind. I often

bring it up to my husband in terms of how it bothers me to see a resource that technically should be renewable is overexploited, which may even be a carbon-neutral resource if done properly" (Source: Interviewee 1). It can be deduced clearly that the respondent had a genuine concern for climate change and hopes that the proper measures are taken in extracting natural resources.

This resonates with the idea of sustainable resource extraction and use. Simply put, sustainable resource extraction and use relate to activities and processes adopted to ensure that exploiting the economic benefits from natural resources produces less harm to the environment and climate for present and future generations. Due to the burgeoning population across the globe and the increase in demand for goods and services, natural resource extraction is on the rise (Krausmann et al., 2018). According to Steffen et al. (2015), the extraction of resources to meet the increasing demand has placed tremendous pressure on the environment because of the processing of these resources and their disposal after use. In absolute terms, global resource extraction and processing contribute to about 90% of biodiversity loss and water stress and cause about half of the effects of climate change (Oberle et al., 2019). This poses a challenge to achieving global sustainability. It is for this reason that the concept of sustainable resource extraction and use comes into play. In summary, a profound statement by Interviewee 7 encompasses the idea of sustainable resource extraction, stating that: "I have a firm conviction that mining can be done in a way that makes a minimal environmental impact and maximizes the value of the products that we mine."

Another essential theme from Interviewee 1's comment was that their background in the environment accentuated her belief and concern for climate change. Many studies have provided evidence to suggest that people's background and personal experience shape their views on climate change. For example, Azadi, Yazdanpanah, and Mahmoudi (2019) highlighted that "people who

experience a disaster or even just learn about it may be more encouraged to take responses, such as preparing for a future event and undertaking risk reduction action" (p. 2). There is a thin line between some climate change impacts and a disaster; thus, when people experience the problem or gain knowledge about it, they become more concerned. For instance, an employee from a mining company mentioned that "the experience that I have had before, has been very much focused on being firstly prepared for climate change but also doing what we can to minimize the impact that we have on the planet" (Source: Interviewee 7). Another respondent indicated that "climate change is taken into account because we are in a harsh environment, so it is always at the forefront of our thoughts" (Source: Interviewee 8). These findings concerning the comments of Interviewees 1,7 and 8 align with the scholarly view that personal experiences, knowledge, and background heightens peoples' belief and concern for climate change. From a corporate perspective, as these employees have gained climate change knowledge and are believers of its occurrence, there is a possibility that this may translate into concrete organizational actions to mitigate the impact of climate change. However, the veracity of this statement can be tested through further research.

Still, on climate change belief and denial, a theme that came up during the interview process was the cause of climate change. There are two prominent opinions concerning this issue. The first one has to do with the fact that human beings are responsible for climate change (anthropogenic) while the other one emphasizes climate change as a natural phenomenon with no involvement of human element (refer to Chapter 2). These views have centered the arguments from both climate change believers and deniers. A response from an oil and gas company employee on climate change perception from a corporate standpoint was: "The organization recognizes that climate change, first of all, is anthropogenic. I guess you could say it is caused by people emitting greenhouse gas emissions, not only CO2 but also methane. So, our tradition is also to try and find

ways to reduce the footprint of our assets in our industry" (Source: Interviewee 6). The respondent's position on the issue hammers that human beings should be blamed for climate change. Also, the responses on companies' contribution to GHG emissions (discussed in the next section) confirmed that the organizations believe in anthropogenic climate change. If that is the case, then acknowledging that fact should be coupled with suitable measures and solutions to combat climate change.

Although most companies were aware and concerned about climate change and willing to consider it in their business model, the degree of concern differed across the companies based on their responses. There are many possible reasons for this, but one striking reason from a respondent was the level of impact. According to a respondent from a mining company: "We haven't considered it too much in the business as of yet. Our life of mine is ten years at the moment, so for us, climate change wouldn't impact us too much, but we're definitely considering it right now" (Source: Interviewee 4). Analyzing the respondent's submission shows that awareness of climate change does not directly translate into corporate actions but rather the level of impact is vital. A company's concern for climate change is likely to increase when it has faced climate change impacts and vice versa. Also, in the respondent's quote time scale is important too – the more long-term the company's planning is, the more likely they are to consider the future impacts of climate change. The possible effect of companies having great regard for climate change is taking action to address the issue. In recent times, companies have proven that they care about climate change (see Ooi et al., 2019). The evidence of the preceding statement was in the latter part of the interviewee's comment stating that steps are being taken to consider climate change. However, some companies leverage the fact that they are climate-focused to market their business (Ooi et al., 2019) and withstand competition from their counterparts. For example, an employee from a

pulp and paper company said: "We are more green-oriented than other industries" (Source: Interviewee 5). Clearly, companies would always take advantage of opportunities that present win-win situations to their business.

As businesses contribute to climate change (Gasbarro and Pinkse, 2016), they are equally responsible for reducing greenhouse gas emissions and paying the price for the damages caused by climate change. According to Damert and Baumgartner (2018), climate change presents businesses with challenges, including compliance, changing consumer attitudes, and stakeholders' pressures to reduce greenhouse gas (GHG) emissions. These external pressures place an onus on firms in the fight against climate change. This sense of responsibility reflects another dimension of corporate perception of climate change, evident in this study. Below are examples of statements from respondents related to companies showing responsibility to act against climate change.

> Our general perspective on climate change from our global organization would be that we need to adapt our current ways of doing business to be more friendly to the environment and look for ways of being more sustainable to support the climate change initiatives. (Source: Interviewee 2)

> We're interested in being as proactive as any company in our operating environment would be. Being a mining company whose method for the deposit we've discovered so far is mainly open-pit mining means that we have a significant footprint. We consider that when we're developing our environmental plans and that will be taken into consideration with our reclamation and closure plans and as well. (Source: Interviewee 3)

> The company is very cognizant of its role in the environment and then the role that we play trying to mitigate or reduce our impact on greenhouse gas emissions with respect to climate change (Source: Interviewee 5).

> I think we as an organization is one where we can do more work in terms of being prepared around climate change. (Source: Interviewee 7)

The organizations are aware of climate change and have moved a step further by accepting their responsibility in developing solutions to mitigate the problem. This shows that businesses recognize that finding solutions to climate change is not a task for only governments but also private businesses and organizations. Ooi et al. (2019) posit that firms across the globe have the propensity to respond to climate change; hence, their involvement is necessary. Inferentially, businesses are partly responsible for climate change and should intentionally adopt measures that will help tackle climate change more holistically.

4.3. Organization's Potential Contribution to Climate Change

Since companies have been touted as significant contributors to global climate change, the study sought to identify the sources of greenhouse gas emissions in the selected companies. In general, most of the companies fully acknowledged that their operations contribute to climate change. From an analytical point of view, transportation in these companies was one of the significant sources of greenhouse gas (GHG) emissions. This was not surprising because transportation alone accounts for 32% of Newfoundland and Labrador's total greenhouse gas emissions, making it the second-largest source of GHG emissions in the province (Department of Municipal Affairs and Environment, 2021). Below was a response from a co-owner of a firewood company concerning emissions from transportation:

> So, one of the main things is that our customer base is looking for a high-quality product, which would be a hardwood, to burn, but the only hardwood commercially available in Newfoundland is Birch. And there's no Birch on the Avalon Peninsula, so all our wood has to be trucked in from central Newfoundland, which is five hours minimum, often more like seven hours being tripped on the transport truck just to get into Saint Johns. (Source: Interviewee 1)

This company is constrained by resource availability and customer needs in reducing emissions from transportation. Considering the hours involved in delivering wood to customers, there is no doubt that greenhouse gas emissions from transportation will be high in the long run. Also, the respondent indicated that tractors on site contribute to the company's transportation emissions. Similar responses by other respondents were: "We have company vehicles that run on diesel and gas, and we travel by air which causes greenhouse gas emissions" (Source: Interviewee: 2), "trucking will be one of our greenhouse gas emission sources" (Source: Interviewee 3).

In contrast, one of the companies did not regard transportation as a major source for GHG emissions. The response of the employee from a mining company was: "Our operations are not remote, so we have access to our site, which I guess inadvertently reduces our GHG emissions from transportation because it's just outside of the community and the majority of people working at the mine site are local" (Source: Interviewee 3). This response speaks to the fact that the location of businesses gives an added advantage in terms of lowering emissions from transportation. However, given such circumstances where companies do not have much control over external factors, it becomes difficult to reduce greenhouse gas emissions while maximizing profits. For instance, in the example above, where the resource commodity is about seven hours away from the customer base, a considerable capital outlay will be required to switch to transporting wood with low emitting vehicles. Regardless of the situation, businesses are created for profits and serve a customer base, but it has become incumbent that they deal with climate change as well.

Another source of greenhouse gas emissions from the companies was the use of equipment and fuel. Most of these companies utilize heavy equipment – which requires a lot of fuel – in their operations and the extraction of resources. According to Interviewee 3: "Our greenhouse gas emissions will be related to drilling and blasting from the use of heavy equipment similar to what

will be used in a quarry because we are an open-pit mine." Another respondent from a mining company buttressed the point on the use of equipment by saying this: "We have a fleet of heavy equipment on-site, like haul trucks, excavators, dozers, graders, and then we do some blasting as well in our pits so the explosives will be included as well" (Source: Interviewee 4). There was an oil and gas company that did some blasting as well. The oil and gas company respondent stated that there are "emissions that come from the vessels that are shooting seismic over multiple months period on the offshore facility" (Source: Interviewee 6).

Taking a critical look at these companies, it is fair to say that a significant portion of their operations is associated with the use of heavy equipment. There were instances where respondents mentioned that most of the equipment and generators used in their facility were powered by diesel. For example, an employee from a mining company's response was:

> One of the areas where we can definitely look to reduce carbon emissions is with our diesel-powered fleet. Albeit it's underground so the sizes aren't as big as you find in surface mines but even, so we know there's a lot of fuel consumed for the equipment that operates at the lower levels of the mine. (Source: Interviewee 7)

A response from another mining company associated with diesel use was: "the concentrator requires a number of generators which run on diesel, our haul trucks also run on diesel, and they run along a haul road 30 kilometers long, so I think those would be our two main contributors" (Source: Interviewee 8). These statements prove how the type of fuel used to power equipment in companies contributes to climate change. Nordelöf et al. (2019) highlighted that electric vehicles or equipment provide potential climate change mitigation as compared to the conventional use of fuel such as diesel in powering equipment.

One other thing related to the above was that one of the companies "burns waste oil from the automotive industry to generate energy for the mill" (Source: Interviewee 5). Similarly, an oil

and gas company employee indicated that "emissions that come from their offshore facility are predominantly from burning natural gas on the offshore facilities to generate power which is used for a lot of different things on the facility" (Source: Interviewee 6). The use of fuel such as diesel and the burning of waste oil and natural gas emit greenhouse gases into the atmosphere causing climate change. It is necessary then to quantify and assess the greenhouse gas emissions related to the use of equipment and fuel in these companies and provide alternatives if possible. In summary, transportation and the use of equipment were the most significant contributors to greenhouse gases in these companies. However, one of the respondents casually mentioned that their use of office spaces could be a minute source of GHG emissions.

4.4. Corporate Climate Change Impacts, Risks, and Opportunities

Climate change is a complex issue that humans are finding it difficult to understand. A tremendous amount of scientific research and technological developments have been channeled to this course (Lehtonen, 2017). Still, climate change presents challenges to all aspects of society (Wright and Nyberg, 2017), and its impacts are sometimes catastrophic. Some of these impacts pose significant risks to businesses, which can be and are factored into organizational planning. When the scenario is twisted, factoring climate risks into business models can provide positive benefits classified as opportunities. More recently, academic scholars and industry professionals have recognized that climate change brings significant risks and potential opportunities to corporate bodies (Elijido-Ten and Clarkson, 2019). For this reason, the study investigated the impacts of climate change on the selected companies and how they translate as risks and opportunities.

From a general perspective, responses received with respect to risks and opportunities were sporadic but had certain similarities discussed as follows. Firstly, a few of the respondents did not

view climate change as having a massive impact on their business in the short term. A typical response regarding this was: "not at the moment. I've been working in this area for four years, plus I grew up here, and I haven't noticed much of a difference in the climate in this area, especially on our site. So as of yet, we've been fortunate that we haven't seen any significant climate change impacts" (Source: Interviewee 4). Also, an employee from a firewood business said: "We haven't specifically witnessed any changing climate conditions affecting our operations yet. Some of our harvesters who are out in the woods and harvesting the trees may see more just in terms of conditions on the ground" (Source: Interviewee 1). According to the responses, there have not been any impediments caused by climate change affecting the companies' business operations. But the cue is that there is a possibility of facing some risks regarding climate change in the future. Subsequently, one of the respondents indicated this: "there is a possible risk because by far our biggest seller is a hardwood product (birch) and if there is a climate change impact where birch grew less readily in the province or if it was harder to access because weather conditions are too dry or wet then our entire business is at risk" (Source: Interviewee 1). A similar response by an employee from a mining company was:

> It's a possibility that if we extend the life of the mine, which is a potential for us, we will probably have risks definitely at our marine facility that we're planning on constructing. We also have a tailings facility on-site for our mill. The length of that is based on the length of a ten-year mine, so if we are open for longer than that, we would definitely have to reconsider and re-plan the capacity basically to deal with the different changing climatic conditions such as increased precipitation. (Source: Interviewee 4)

The responses above show that the companies are obviously aware of the various impacts (changing weather conditions) that climate change could have on their operations in the near future. "I do fairly a bit of research related to CO2 emissions and its effects on climate change so

I am aware of what can happen and what is happening in terms of strengthening of storms because we see in the offshore that storms' intensity has been increasing as well as their frequency, so that's something that I know" (Source: Interviewee 6). This implies that businesses may not be impacted by climate change now, but there is a constant cognizance of its existence. However, companies are demotivated to act against climate change when its short-term consequences cannot be felt (Weinhofer & Busch, 2013). To this end, identifying or predicting future events related to climate change shows that there is a possible risk (see Bui and de Villiers, 2017) necessitating corporate action. Moreover, this demonstrates the uncertainty of climate change and the need to consider it in all sorts of business planning.

The other category of responses gravitated towards the fact that the impacts of climate change stand as a risk to their businesses. A typical response was: "our drilling derrick was all open to the environment, so if it was a rainy, snowy, icy, or windy day because of climate change and the impact it has on the weather in Newfoundland, our workers were being battered by offshore weather in Newfoundland" (Source: Interviewee 2). This respondent was speaking to some of the abnormal and harsh weather conditions associated with climate change. Analytically, these extreme weather conditions can lead to halting business operations for several days and raise safety issues. This was captured in a comment from a respondent: "we recently lost several days of production in our mine, and we are dealing with extreme storm events that happened on the Baie Verte Peninsula and how that has inundated with runoff water onto our site" (Interviewee 3). When immediate response measures are not taken to remediate the problem in such circumstances, there is room for looming danger (risk). Aside from the storm events, Interviewee 3 maintained that extreme rainfall also impacted their operations negatively, but these situations were classified as minor risks.

For the pulp and paper mill, the respondent highlighted several instances where the impact of climate change affected their business. Witness the respondent's comment: "Our factory's hydroelectricity relies on water from a lake, and lower precipitation levels have impacted that in the past years. Also, we have seen changes in the sea level impact our infrastructure for shipping at the mill. Another example is seasonality changes makes it harder for us to access roads to harvest wood for production" (Source: Interviewee 5). There is no doubt that climate change has a significant risk on this business. The fact that the company derives its energy from hydroelectricity means that lower precipitation levels can affect production targets. This is a major risk because when production targets are not met, profits are likely to fall. Also, such climate change impact can relegate the company to the bottom of the competition with other similar companies because of reduced production rate. Concerning changes in sea levels and their effect on shipping infrastructure in the company, apparent risks may include the inability to meet supply chain demands and the increased cost of maintenance. The impacts of climate change in one of the mining companies were akin to the mill company. For instance, one respondent from a mining company stated that: "there was a washout of the trans-Canada highway around the Springdale area due to heavy rainfall and that closed the road for four days. That impacted our materials getting through to our business, which directly links to a changing climate. Also, when we get extreme weather events, our power lines and infrastructure are at risk" (Source: Interviewee 7). In the long run, the companies' financial outlook will be on the downside if such climate change impacts persist. It is not surprising that Tsalis and Nikolaou (2017) indicated that firms profess climate change effects as a threat to companies' financial worth in certain circumstances. The economic consequence of climate change's impacts was captured in the response of Interviewee 5:

> If we can't access wood that's closer to us because of climate change and we go further away, the wood then becomes more expensive, which impacts our ability to turn a profit, shipping schedules are turned upside down, so it impacts our customer delivery schedules, and if we don't get enough water in the lake to generate power it reduces our output and if our output reduces then we can't produce enough to cover our fixed costs.

The significant finding here is that climate change poses financial risks to businesses.

An important theme that emerged was the influence of government policies and regulations in dealing with climate change. According to Bryant, Griffin, and Perry (2020), public policies are tools that governments utilize to push companies to adopt sustainable practices, hence reducing the adverse impacts of climate change. In the context of climate change, carbon pricing policies have become common in regulating and overseeing emissions from industries. Recently, scholars have argued that climate change regulations have significant risks on firms – classified as regulatory risks (Elijido-Ten and Clarkson, 2019). One respondent working in an oil and gas company held a similar view on the topic. The interviewee stated that: "government's response to climate change through its carbon tax probably has a larger impact on our business because the price of power will increase to 170 dollars a tonne by 2030 and that could drive a lot of emission reduction technologies from a business standpoint" (Source: Interviewee 6). According to the respondent, the government's enforcement of carbon taxes can take a toll on companies and influence innovative actions. Therefore, carbon pricing has a negative short-term impact on companies but may ultimately influence beneficial long-term innovation. Juxtaposing the foregoing results on climate change risks with literature paints a vivid picture of corroboration. This is because the major climate change risks identified relate to extreme weather events, financial outlook, and regulations. In Tsalis and Nikolaou's (2017) paper, physical threats such as severe

weather events are grouped under direct impacts of climate change. In contrast, regulatory, financial, and reputational risks are under the umbrella of indirect effects.

As a preamble to the rest of this section, the comment of an employee in a mining company is highlighted below:

> It's interesting that because of climate change, our revenue has spiked over the years. The reason is we're a copper producer, and there's a huge demand for copper now for electrification of vehicles, solar power generation, and wind power distribution as part of greening the world. So, that is a positive for our organization from the point of view of climate change. (Source: Interviewee 7)

The preceding quote empirically reveals the other aspect of climate change's effect on businesses. On the positive side, literature suggests that climate change provides benefits to companies. The study examined this assertion by investigating whether companies foresee potential opportunities and have harnessed any to grow their business. Comparatively, the majority of responses sided with the general notion that climate change brings potential opportunities. But whether the firms have tapped into these opportunities is discussed below. Firstly, a significant point highlighted by one respondent related to consumers' attitudes and decisions regarding climate change. Witness the respondent's comment: "We definitely see a lot of people wanting to switch to wood-burning from oil just because a lot of people consider burning wood as a greener option instead of burning oil, and I think there's a good chance for our business in that sense" (Source: Interviewee 1). This may be indirectly related to climate change, but it is a clear sign of an opportunity.

Consumers have embraced the idea of sustainable living and factored it into their decision-making in purchasing goods and services. In that light, peoples' decision to switch to wood-burning based on the perception that it does not emit greenhouse gases as much as burning oil has benefited the firewood business by increasing its customer base and revenue. This shows that climate change is at the back of people's minds, and any well-positioned organization is capable of reaping the

associated benefits. Furthermore, consumers' decisions can pressure firms to adopt new ways of doing things, thus giving a competitive advantage to those firms. However, in this study, a respondent held a different view by saying that: "although our products are produced with green energy, which is a selling point for our products, I can't say that it gives us a competitive advantage because it's mostly a commodity product that we produce" (Source: Interviewee 5). The implication is that caution should be taken in generalizing patterns because different contexts and scenarios can expose blunders.

Secondly, climate change allows businesses to improve their processes and innovate to meet the current demands (see Elijido-Ten and Clarkson, 2019). This was evident in this study as a response from an employee working in the oil and gas sector indicated that: "I don't want to say that climate change is good, but because of climate change we've had a 180-degree change in the way in which we operate our business and this has provided us with a lot of opportunities to change our way of thinking to things outside of strictly oil and gas and how we can certainly support achieving global sustainability" (Source: Interviewee 2). From the researcher's perspective, the respondent implied two things: an issue of morality and a win-win situation. According to Elijido-Ten and Clarkson (2019) firms naturally view acting against climate change as a moral challenge. This is because there is a consensus that adaptation actions are needed to combat climate change; hence firms believe that their response will either confirm or reject the "right thing to do." This sense of morality is loosely portrayed in the first part of Interviewee 2's response, which appreciates the severity of climate change. This was similarly captured in another response stating that: "if there was no climate change, it abhors to me that we will damage our planet even if it wasn't causing any harm that we could tangibly measure" (Source: Interviewee 7). The remaining part of Interviewee 2's response demonstrates that although climate change is beneficial to the

firm, it presents a win-win situation by helping achieve environmental sustainability. Subsequently, Interviewee 2 highlighted that:

> We are constantly developing solutions for clients in alternative energy sources, we are involved in the electrification development of certain offshore installations, we do have parts of our business focused on wind energy, and we just got awarded for a wind energy project here in North America. We have an aim that by 2025 a third of our revenue should come from low carbon and oil and gas projects or renewable energy businesses.

It can be inferred that climate change has induced the company to expand its market by not focusing only on the oil and gas sector but also exploring other options.

While some of the companies were taking advantage of the current opportunities, others hoped to harness the benefits in the future. For instance, an employee from an oil and gas company highlighted that: "from an opportunity standpoint, I think there's an opportunity for our organization to incorporate technology into our work and employ more people in our bid to reduce GHG emissions in the future" (Source: Interviewee 6). This respondent sees the benefits of responding to climate change transcending the organization. Also, a respondent from a mining company highlighted that: "I don't think we can predict what the climate will do enough actually to benefit from it. If we see trends that require us to use, for example, less energy for heating, then we would benefit from that certainly" (Source: Interviewee 8). This statement implies that there is no direct benefit of climate change accruing to the firm in the short term because of uncertainty. Climate change is a phenomenon that has a great deal of uncertainty which in some cases drive adaptation actions or otherwise (see Gasbarro and Pinkse, 2016). However, when there is more clarity on climate change effects, firms would take adequate response measures.

The findings, therefore, confirm some of the literature on climate change risks and opportunities. In a nutshell, climate change comes with primarily harms, but businesses can look

beyond that and benefit from it in a myriad of ways. According to this study, principal climate change benefits related to the increase in revenue and creation of new markets – which were a function of consumers' preferences, process improvement, and technological innovation.

4.5. Isomorphic Pressures and Corporate Climate Change Responses

This section aims to identify the factors influencing companies to act with respect to climate change. This subject is an essential aspect of the business and climate change nexus that few scholars have investigated thoroughly. A typical study conducted by Inderberg and Løchen (2012) revealed that climate change regulations enforced by governments at the national level drove concrete adaptation actions by firms in Norway and Sweden. Other scholars have also found that prior experience with the impact of climate change, concerns about the risks posed by climate change, organizational capacity (leadership, commitment, staff availability), and business size influence companies to respond to climate change (Kang, Yoon, and Rhee, 2017, p. 389). This thesis, for example, has shown earlier (see section 4.2) that those personal experiences with climate change have motivated some employees in the companies to incorporate climate change into decision making – concern for climate change risks is a similar motivation. An organization with the right leaders and commitment to climate change will also be more proactive in terms of climate change actions. Collectively, these factors demonstrate that companies do not act based on impulse, but instead, there are driving forces behind their actions – either from within the company or externally (see Damert and Baumgartner, 2018).

This study took a different approach in understanding the causes of corporate responses by using isomorphic pressures – a component of institutional theory (DiMaggio and Powell, 1983). Institutional isomorphism basically refers to firms adopting similar practices, strategies, and

structures as other firms within the same institutional environment over time – the result of which is homogenous organizations (DiMaggio and Powell, 1983). According to the theory's proponents, institutional isomorphism is exhibited in three ways: mimetic, normative, and coercive forces. These forces are the antecedents of organizational practices and change, which makes companies look similar over time. Based on the theory, this study examined the extent to which these institutional forces have influenced the selected organizations' response to climate change.

4.5.1. Mimetic Forces and Corporate Climate Change Responses

To begin the discussion, mimetic isomorphism occurs when firms copy similar practices from another organization within the same industry (refer to Chapter 2). For this thesis, a majority of the responses affirmed that mimetic forces significantly influence companies to adopt similar climate change responses. For instance, an employee from a mining company maintained that: "I would say maybe not from a mining company, but the company that I came from had a very progressive approach to reclaiming and closing quarries, so we've reinforced that in our organization which is way beyond provincial requirements" (Source: Interviewee 3). The practice adopted by the organization may not be directly related to climate change but shows how firms within the same industry can imitate each other.

A common trend associated with mimetic pressures is the "follow the leader" type of arrangement. This became prominent in the early works of Haunschild and Miner (1997), which classified this type of arrangement as an outcome-based imitation. Companies implement successful strategies from leading organizations, avoiding the painstaking process involved in designing a new action plan. This was evident in this study based on the response from an employee in an oil and gas company: "Norway is a leader in greenhouse gas reduction within the climate change space in general, especially from their state-owned companies and their regulators.

We're trying to understand what they've done and how we can emulate that so we're playing this little game of following the leader type of thing" (Source: Interview 6). Similarly, an employee of a pulp and paper mill indicated that: "every year we have the centre of excellence for environmental safety and energy where all the mills in the parent organization get together and present their energy reduction projects which give us an opportunity to see what other mills are doing and copy some of their work and implement that in our mill" (Source: Interviewee 5).

On this note, the researcher confirmed that there is a possibility that mimetic forces push companies to adopt similar practices in addressing climate change. Subsequently, Interviewee 5 highlighted that: "we've taken advantage of adopting things like sieving our processed water running through the heat exchanger to first warm up some of the incoming water, so it reduces the amount of self-generated energy that we need to bring that incoming water up to temperature." Also, a respondent admitted that: "in Norway, power is generated from onshore for offshore activities which isn't really done anywhere else so we're trying to figure out how we can implement that in our offshore but that hasn't been implemented here yet" (Source: Interviewee 6). From the previous section, it was revealed that equipment used in offshore activities was mostly diesel operated. So, generating power onshore provides an opportunity to produce power from clean energy sources, which will reduce GHG emissions in the atmosphere. Assessing such a strategy by the organization for a possible implementation undoubtedly portrays a mimetic pressure. The above examples typify the influence of mimetic forces from organizations that causes other similar companies to respond to climate change.

Another response from a co-owner of a firewood company was:

> We do follow a lot of other firewood businesses on social media just to get an idea of what they've done, and even just recently, I was messaging with a business talking about their packaging options and

> what they use and if they have been able to source any product that did work better than plastic. (Source: Interviewee 1)

According to the response, mimetic pressure is at play. For this firewood business co-owner, there is recognition that duplicating actions from other organizations is a way to respond to climate change more quickly and effectively. The co-owner wants to adopt measures that are already working within the other organization. This relates to the literature, which emphasizes that organizations copy similar practices from others because it is less costly and less risky (see Miemczyk, 2008). Another advantage is that it can increase the social acceptability of the firm's actions because the public and various stakeholders may be aware of the adopted action.

The only caveat of the theory is that isomorphism should occur within the same institutional environment. According to DiMaggio and Powell (1983), an institutional environment constitutes rules, norms, and regulatory agencies operating within the same industry. However, Interviewee 1 stated that: "we're the biggest direct firewood provider in the province, so there's no one else in the province that we've looked to." An oil and gas company employee reiterated this by stating that: "we look at a Norwegian oil, gas and energy company and we are trying to mimic some of their strategies" (Source: Interviewee 6). This highlights a gap in the theory concerning the geographical position of similar firms. Each province in Canada has its regulations binding companies operating in all industries. So, when businesses are in locations with different sets of regulations, it becomes difficult to place the theory into a specific context. This means that further clarification and work should be done in determining what constitutes an isomorphism. That is, should isomorphism be based on satisfying all the elements of an institutional environment or some of them? Perhaps, in this case one can say that Interviewee 6's response cannot be called an isomorphism. Rather, it conforms to the practice where companies are usually capable of assessing

how similar another company's institutional environment is and then adjust any lessons that they learn accordingly.

Although there were trends of mimetic pressures, one of the respondents did not attribute their organizations' climate change responses to practices from a similar firm. For example, an employee from a company working in the oil and gas sector indicated that: "I don't know where we get our ideas, to be honest, but I can't say that we've adopted them from other organizations. I think in the business of continual improvement, everybody learns from everybody else. Still, I wouldn't be able to put my finger on whether we took this from another company and now we've implemented it here" (Source: Interviewee 2). The interviewee's comment generally dissociates from the notion that their firm copies similar climate change actions from another organization but relates more closely to normative isomorphism discussed in the next section. Also, it could be that the ideas are ultimately coming from other companies, but it's just difficult to trace that sort of thing.

4.5.2. Normative Forces and Business Climate Change Responses

Normative forces emanate from discussions in professional networks and connections (refer to Chapter 2). Companies utilize these opportunities to learn from other firms. This research investigated whether companies adopted some climate change responses from other organizations due to normative forces, as presented in this section. According to the data collected, most companies were associated with an industry association or group where they build relationships and learn from each other. Witness a response from a co-owner of a firewood company: "we're always members of the Newfoundland Environmental Industry Association (NEIA), and I used to be on the board there years ago, and so we've just maintained a relationship there. We're not a major player in the Newfoundland and Labrador Forestry Industry Association, but we still offer

to be involved and keep in touch regularly, but nothing has been done in our organization in terms of climate change due to these connections yet" (Source: Interviewee 1). The interviewee's response indicates that their company collaborates with associations within the industry, but there have not been any climate change actions that have been adopted from another organization yet. A probable reason for not implementing any climate change action is because the company is not considered a major industry player or it's difficult to trace specific decisions back to their sources.

In Newfoundland, the big players in the forest industry are the pulp and paper mill and sawmilling companies, so more attention is directed there. The effect of this is that discussions or actions related to climate change may not apply to the firewood company because of its size, capacity, and ways of operation compared to the major industry players. In the same vein, an employee from a mining company stated that: "I'm on the Newfoundland Environmental Industry Association and one of our company members is in Mining NL, but due to the stage that we are I would say it has raised our awareness about climate change, but we haven't translated that to concrete plans yet though we have plans to do that" (Source: Interviewee 3). The respondent implied that they are a junior mining company, and these professional networks have heightened their consideration of climate change in their operations in the future. Again, the company's size can be a factor for not implementing any actions from another mining company (see Kang, Yoon, and Rhee, 2017). However, there is still an element of normative pressures inducing the companies to respond to climate change by adopting similar actions from firms within the industry associations.

An interesting comment that flips the discussion a bit was:

> We're big members in Newfoundland and Labrador Oil & Gas Industry Association (NOIA) and NEIA, and through those organizations, we network a lot to learn from each other, and I've been helping to communicate the small things that we've done within our office and the

> positive impact on our greenhouse gas emissions and encourage other companies to do the same thing. (Source: Interviewee 2)

There is an element of teaching in the interviewee's response that was intriguing to highlight. The study aimed to assess how normative forces influenced the selected organizations, but this case was different. According to the respondent, these professional networks allowed them to teach other companies what they were doing. In fact, normative forces somewhat influenced other organizations in these networks than the subject company. This throws light on activities that occur within professional networks, which leads to normative isomorphism. However, as much as the organization transmits information about its climate change responses, it also learns from other companies, which signals normative pressures.

A few organizations believed that their responses did not evolve from professional links, and if they did, it was not climate change related. For example, a respondent from a mining company stated that: "in general, a lot of the things we adopt are not 100% climate change-related. For example, with water mitigation and making sure we remain in compliance with all those guidelines, we attend conferences with other mining companies, and everybody comes together and talks about what they're doing at their site, and then other people can adopt it at theirs" (Source: Interviewee 4). Similarly, an employee from an oil and gas company highlighted that: "I think we're still at an early stage for a lot of these things, but we're exploring different networks and involved in a number of different networks, but anything that has significant GHG reduction standpoint I don't think has been adopted through any professional networks as of yet" (Source: Interviewee 6). Clearly, trends of normative isomorphism exist within this response but not concerning climate change.

Also, a reaction from an employee in a pulp and paper mill was: "we don't really associate that much within the province because industries in the province are so diverse in terms

of the relevance of their situations to us. I'm sure there may be some things other sites have done that we could learn from, but we are not aware of any kind of forum to do that inside the province" (Source: Interviewee 5). This response asserts that there are no professional networks related to the organization's industry to enable the adoption of climate change actions. It was fascinating to see this comment because the Newfoundland Environmental Industry Association is a significant natural resource industry association in the province. The Newfoundland and Labrador Forestry Industry Association was mentioned by a respondent working within the forest industry as well. These associations have been avenues for companies within the natural resource sector to connect and learn from each other, so it is difficult to agree with the statement from the respondent. The relevance of Interviewee 5's response to this study is that their organization is not faced with normative pressures to adopt climate change strategies from similar firms. In conclusion, this section has shown that most selected companies are connected and associate within the industry. This allows them to learn from each other and adopt similar climate change practices due to normative forces. However, normative influences were harder to identify because none of the responses seem to give concrete examples of things learned, although most of them were confident that learning occurs.

4.5.3. Coercive Pressures and Corporate Climate Change Responses

The use of government control in the form of regulations and policies affects the behavior of companies. Bryant, Griffin, and Perry (2020) posit that government policies act as an impetus for compliance. The institutional theory asserts this notion by emphasizing that regulations push firms to act similarly, leading to coercive isomorphism (DiMaggio and Powell, 1983). Based on this assertion, the study sought to investigate whether government authorities' climate change regulations and instructions influence corporate actions. A significant finding from the study was

that rules did not put enough pressure on the companies to act in a certain way concerning climate change. The following paragraphs highlight some of the responses.

A respondent from the firewood company stated that: "No, there are no regulations that push our company to act. I don't know if the government works with the wood harvesters directly to reduce their output or the transportation level, but at our level, it's never been, and we don't have to report anything like that" (Source: Interviewee 1). For the sake of reference, this company indicated that transportation was one of their primary sources of GHG emissions due to trucking. So, for an organization to acknowledge its contribution to GHG emissions without requirements from the government to respond highlights a policy need. However, an assumption was made by Interviewee 1 regarding the government's "inaction," which stated: "This is me speculating with no evidence of this whatsoever. The forest industry is a rural industry, so I would assume that the government wants to keep it viable." The researcher did not have the opportunity to speak with a government representative on the issue, hence, no conclusion can be made in this respect. That notwithstanding, it was essential to highlight this point because inaction could connote action in certain circumstances (see Albarracin et al., 2019). In this case, the government may use policy action to drive more investment into the forest industry. Also, an employee in a mining company indicated: "No, I don't believe that there are specific climate change regulations; however, a lot of the regulations are focused on health and safety and environmental protection" (Source: Interviewee 7).

Based on the evidence gathered from the study, there is a considerable policy need for the government of Newfoundland to provide specific and detailed instructions on how companies within the natural resource sector can mitigate their climate change impact. Respondents raised similar concerns regarding the issue. Consider a response from an employee of a mining company:

> There are no regulations right now. An Environmental Protection plan is required in the Environmental Impact Assessment (EIA) process and reclamation closure plans. But when it comes to acknowledging, understanding, or implementing anything to do with climate change is minimal. I would say probably they're being acknowledged, but we are not required to, and even if we did calculate our greenhouse gas emission, no one has ever asked us for it. I come from a construction background, so I spent the last 11 years working on mega projects such as Muskrat Falls in the province before coming to my current company. I realized that with those bigger projects, the expectations are there, but other than being classed as a special project in Newfoundland, the expectations are not there, and the motivation might be internally driven. Our social responsibility might want us to do something but translating that into actionable items is difficult. So, I think that there's a huge number of opportunities for the government to impact medium and large businesses and not only megaprojects to respond to climate change. I think there's a real lack of education on this too as an industry, and sometimes I still struggle with what all this means and how it's going to be translated into expectations of how we can mitigate climate change. (Source: Interviewee 3)

The narration above reveals a peculiar problem in Newfoundland's natural resource sector. This explains how regulations are necessary tools for the government to influence a change in society. Because voluntary actions by companies in the form of Corporate Social Responsibility (CSR) alone cannot bring the desired change the province needs, which is to reach net-zero emissions by 2050. Also, some companies capitalize on CSR to build a good reputation for their business, translating it as "business as usual" and not climate change mitigation or adaptation. Therefore, "there's still a lot of work that needs to be done to pass specific regulations on things that organizations can do or should do to decrease their greenhouse gas emissions" (Source: Interviewee 2).

Despite the various comments on no specific regulations, a few companies showed that the government's economic instrument of taxing carbon emitted by companies prompted some climate change responses. For instance, Interviewee 2 claimed that: "No climate change regulations

specifically, but we had conversations around carbon tax to understand how that was going to impact us directly, and that's when we kicked off some of the sustainable or the greenhouse gas emission reduction planning here." Another respondent held a similar view: "No specific regulations except for this new one which is the carbon pricing of greenhouse gas emissions. So, for that one, if we're over a certain target limit for tons of greenhouse gas emissions emitted, we will end up having to pay, so the goal is to try to put our feet below that limit. That I guess will be a driving factor to try to keep our emission levels underneath the target" (Source: Interviewee 4). The respondent was speaking to the penalty that comes with not meeting greenhouse gas emission reduction threshold set by the government. In Newfoundland and Labrador, large industries that are unable to adhere to emission targets are required to pay into the Greenhouse Gas Reduction Fund any required remaining obligation to be in compliance at a rate equal to four times the federal carbon price in that year (see Government of Newfoundland and Labrador, 2018). Arguably, Newfoundland and Labrador's implementation of the federal carbon pricing plan does not motivate industry adaptation to climate change. Governments do not only use regulations to change behavior; economic instruments such as taxes are other forms of policy tools (Howlett, 2018). Based on the respondents' claims, it can be deduced that though there are no specific regulations, there is a coercive force driving some climate change actions.

In addition to carbon taxes, one of the respondents mentioned a proposed law that will drive climate change actions from industries. "The Clean Fuel Standard will impact how we do business, particularly for example our tankers that shovel oil back and forth use high emission fuel so we would have to pay higher. There's an incentive there for us to use a lower-emission fuel on some of these tankers and vessels. So that policy could have a significant effect on our bottom line of business" (Source: Interviewee 6). The Clean Fuel Standard is a regulation that will come into

force in 2022 to help Canada meets its climate change emissions reduction target and drive innovation (Government of Canada, 2020). The respondent anticipates this regulation as influencing their business operation through finding ways to reduce emissions – a typical example of coercion.

In conclusion, this study has demonstrated that the three isomorphic forces have played prominent roles in companies' responses to climate change. Regarding the level of influence, it is fair to conclude that mimetic forces (through copying leading organizations) had a significant effect on these companies compared to normative (through industry association meetings) and coercive forces (through carbon taxes). In the long run, the interplay of these forces within the natural resource sector could lead to isomorphism. Lastly, based on the responses given, the natural resource sector of Newfoundland is not regulated comprehensively, calling for policy action as captured in the response below:

> I think the theme from where I sit is that it is a strong policy that will drive GHG emission reductions, and the best policy that we're aware of is carbon pricing plans, and that can be a carbon tax or cap and trade or some combination of both. I don't think from where I sit the offshore emissions will be reduced just on their own though there is a big Environmental, Social, and Governance [ESG] component that makes companies want to reduce emissions because it makes their company look more favorable from an ESG standpoint. So, I think anything that can be done from a regulation standpoint trickling down to the offshore has a lot of potentials to reduce emissions there significantly. (Source: Interviewee 6)

4.6. Businesses' Climate Change Actions/Responses

The subject of business responses to climate change has increasingly gained attention over the last two decades. In the early 2000s, scholars such as Kolk and Pinkse (2005) stated categorically that there was a shift from businesses opposing climate change regulations to utilizing market strategies – including but not limited to product and process improvement – in the

bid to reduce emissions. A significant number of studies have contributed to the literature on the topic. This research, however, focuses on businesses in the natural resource sector because of its climate sensitivity. It has been established in previous sections that firms play an integral role in curbing the impacts of climate change. There are several motivations in the form of risks and opportunities that account for corporate climate change responses. This study establishes that the three isomorphic forces have shaped businesses' actions regarding climate change. Therefore, it is indispensable to spotlight some of the responses and measures adopted by the selected companies, which answers my third research question.

Generally, most of the selected companies were involved in climate change mitigation. None of the companies were involved in climate change adaptation. An example of a comment concerning this was: "there hasn't been too much that we've talked about in terms of adapting to climate change other than responding to the greenhouse gas tax and working on projects that will help reduce our exposure to the taxes" (Source: Interviewee 5). Based on the response, it would be apt to conclude that the firm is more concerned about the impacts of climate change on its business than solving the problem entirely. Therefore, companies will shift their attention from mitigation if there is an economic incentive for climate change adaptation. However, this study did not seek to examine why businesses neglect climate change adaptation – a possible area for further research. Studies such as Linnenluecke & Griffiths (2010), Pinkse & Kolk (2012), Sussman & Freed (2008), and Tashman et al. (2015) have also suggested that firms do not pay much attention to climate change adaptation. Nevertheless, climate change mitigation is a step towards reducing the grievous effects of climate change.

A major theme that runs through the literature on corporate climate change responses is innovation (Kolk and Pinkse, 2005). It is believed that firms become innovative when responding

to climate change through developing new products and improving processes. Trends of innovation were evident in this study as companies employ measures to reduce their greenhouse gas emissions. A typical response was: "we're trying to be a bit more innovative. We have some solar panels, and we use solar power for certain things, and we're in the middle of trying to see if we can have one power on-site" (Source: Interviewee 4). In the same respect, an employee of a firewood company stated that: "we've tried to source wood for our customers that [they] would be interested in and are closer to reduce the trucking. That would be the main one, and then another would be trying to switch to biomass burning for kiln operation instead of diesel or oil. The third would be using more natural product packaging options instead of plastic" (Source: Interviewee 1). For this business, greener options are implemented to reduce the GHG emissions from their operations. This makes the company proactive in terms of climate change responses, as captured in the interviewee's response: "just like a constant we try to factor climate change into our decision making each day or each year" (Source: Interviewee 1). Based on Interviewee 1's response one can say that the company is responding to climate change due to moral reasons.

Firms take different approaches to respond to climate change. According to Kolk and Hoffmann (2007), companies may decide to wait, hold back, explore, take steps, innovate, or learn in responding to climate change. For example, an employee of a mining company indicated that: "we've become engaged with a couple of industry associations to better educate ourselves on what we can do" (Source: Interviewee 3). Also, the response given by Interviewee 1 demonstrates that the company is taking steps and innovating its processes to reduce its environmental footprint. Similarly, another respondent highlighted some innovative practices in their organization aimed at reducing their GHG emissions. According to the respondent:

> We're working on things like wind energy, carbon capture, hydrogen, and electrification of current and future resources, and we're rolling out

> a tool called *Just Eco*. It's an application that we will be using to gauge the greenhouse gas emissions that would be created by modifying certain equipment to identify which options we should go with when we're presenting that to our clients for some of the modifications that we would be doing on existing infrastructure or even new infrastructure (Source: Interviewee 2).

Industries generate clean energy from renewable sources such as wind because it is considered one of the innovative ways to mitigate GHG emissions. Clearly, the chosen businesses are looking for ways to reduce their emissions through improving processes – which is a typical organizational climate change response. Table 4 below depicts some of the actions taken by the chosen companies to reduce GHG emissions.

Table 4: Summary of Climate Change Actions

Company	Actions taken	Source
Firewood Co	-Substitute diesel and fuel with biomass burner -Using a sustainable packaging material -Supply customers in closer proximity to reduce trucking	Interviewee 1
Pulp and Paper Co	-Uses its own hydroelectricity -Increased burning of biomass instead of oil	Interviewee 5
Oil and Gas Co 1	-Generate energy from renewable sources like wind -Electrification of resources/equipment -Monitor emissions from sources such as air travel and fuel and gas use -Created an application called Just Eco to gauge emissions from equipment -Sustainable practices in the use of office spaces	Interviewee 2
Oil and Gas Co 2	-Developed a strategic plan to reach net zero -Applied for funding to use emission reduction technologies from flaring and transportation	Interviewee 6
Mining Co 1	-Plan and allocate extra resources for extreme storm events -Switched from diesel generators to using main power grid	Interviewee 3
Mining Co 2	-On-site weather station to track temperature, wind speed and storms	Interviewee 4

	-Use of solar panels -Waste recycling -Switched from diesel generators to main power grid -Implemented anti-idling policy	
Mining Co 3	-Waste recycling -Recording emission internally -Considered switching from diesel powered equipment to battery operated or direct electrical equipment	Interviewee 7
Mining Co 4	-Report emissions -Planning to switch from the use of diesel to hydropower -Implemented anti-idling policy	Interviewee 8

(Source: Author's construct)

The table demonstrates that actions implemented by the organizations are mainly towards greenhouse gas emissions reduction. Most of the companies indicated that their major contribution to climate change was the use of fuel and equipment. So, it is not surprising to see most of the companies' actions geared towards switching to the use of clean fuels and renewable energy to power their operations.

Monitoring and reporting emissions are considered one of the ways by which companies respond to climate change (see Tang and Demeritt, 2018). This study examined whether the chosen companies had a strategic plan to deal with climate change and reported their emissions. Quantitatively, only two companies were making efforts to capture climate change from a strategic point of view, and just a minority measured and reported emissions. According to an employee working in the oil and gas sector: "We are currently developing a strategic way forward, and I've mapped out a pathway forward of how our organization and our industry could get to net-zero by 2050 and so part of the next steps in trying to cast that and getting everybody on board" (Source: Interviewee 6). This statement exemplifies leadership and corroborates some of the claims from the literature. For instance, Kang, Yoon, and Rhee (2017) emphasized that organizational capacity

in the form of leadership drives innovation and is instrumental in developing alternative solutions to greening businesses. The respondent from the other oil and gas company claimed that: "we're climate-smart certified, and it's a certification process whereby they help us to gain an understanding of our greenhouse gas emissions that we're creating, and we then have to build a greenhouse gas reduction plan every year" (Source: Interviewee 2). Some companies tend to participate in different certification processes such as LEED to demonstrate their continuous commitment to ensuring sustainability. The advantage of this approach is that it helps firms build a good reputation, and it also serves as a sign of taking a proactive stance on climate change.

With respect to emission reporting and measurement, one of the outstanding comments was: "we've been participating in the Carbon Disclosure Project [CDP] for less than a year now, we report on the Towards a Sustainable Mining Program, and we also report to three jurisdictions – two provincial and one federal jurisdiction – so we provide quite a bit of reporting on our emissions" (Source: Interviewee 8). The response indicates that the organization is extensively involved with emission measurement and reporting and could benefit from this in two different ways. First, reporting emissions to a voluntary scheme like CDP reveals the company's emissions to the general public. Hence, the company can maintain an excellent public image if it continues to keep emissions lower – resulting in increased investment and returns in the long run. Second, reporting emissions to government bodies will keep the organization accountable and help reduce emission costs in the form of taxes. Despite external voluntary and mandatory reporting schemes, some companies keep track of their emissions internally. This was evident in this study as stated in a respondent's comment: "we've started recording internally all of our water used, all of our fuel burnt diesel and fuel which we use in our equipment, we also use propane for heating in the winter, so we record that too, and the idea is that this will be something that we report as part of our

sustainability report" (Source: Interviewee 7). Measuring emissions internally and incorporating them into sustainability reports may be a good practice but can be sketchy as well. This is commonly encompassed in the concept of *greenwashing*. Furlow (2010) defined greenwashing as "the dissemination of false or incomplete information by an organization to present an environmentally responsible public image" (p. 22). Some organizations produce falsified data on their emissions to gain a competitive advantage; however, consumers have begun to doubt such information published by companies (see Furlow, 2010).

Although most companies had implemented climate change mitigation actions, one of the companies' situations was slightly different. According to the respondent: "I do think that because we're a junior mining company and we're not comparable to any of those big players in the industry, we are constrained probably by the need to do something and the desire to do something. We might want to do something, but right now in Newfoundland, the legislation doesn't have a requirement that matches our desire to do it" (Source: Interviewee 3). Analytically, the response highlights two things: business capacity and size and government control. The size and capacity of businesses influence the kind of action that would be adopted. In many circumstances, it is prevalent to find larger enterprises such as Coca-Cola implementing climate mitigation measures because it has the financial muscle and resources compared to smaller businesses. For instance, Kang, Yoon, and Rhee's (2017) study identified business size as a motivating factor driving climate change adaptation actions. This thesis, therefore, provides a further confirmation of the finding based on the response from Interviewee 3.

The second point raised by the interviewee brings to bear the powerful influence of governments in changing behaviour through regulations. However, the peculiar situation in Newfoundland in terms of climate change regulations calls into question the feasibility of the net-

zero emissions target by 2050. Because industries contribute significantly to the emission profile of Newfoundland, more specific and stringent climate change regulations will be required to avert the glaring problem. In summary, the selected firms in the natural resource sector are playing an essential role in reducing greenhouse gas emissions in Newfoundland. Despite the lack of specific climate change requirements and control from the government, some businesses in the sector have still managed to respond to climate change positively. This implies that there is room for companies to do more especially if they are incentivized or required to do so by the government. Generally, firms have become cognisant of climate change and are taking responsibility to mitigate its impacts – which should be appreciated and not overlooked.

Table 5: Research Questions and Corresponding Findings

Research Question	Main Findings
What are the companies' perception of climate change?	-Companies were aware of climate change -They believed in anthropogenic climate change -Companies showed that they have a responsibility in dealing with climate change
What are the impacts of climate change on businesses?	-Major impact of climate change related to extreme weather events such as storms and extreme rainfall -Loss of several working days due to extreme events affecting productivity -Imposition of carbon taxes by the government
To what extent did isomorphic pressures influence companies' responses?	-Mimetic pressures induced companies to copy similar strategies from other firms by following them on social media and looking up to leading organizations -Normative pressures had an influence through industry association meetings -Coercive pressures mainly emanated from carbon pricing and not climate change regulations
What are the companies' responses to climate change?	-Companies were pro-actively involved in climate change mitigation -There were trends of innovation among some of the companies

	-Some of the companies actively measured and monitored emissions

(Source: Author's construct)

In conclusion, the above table summarizes the main findings of the study in relation to the research questions.

CHAPTER FIVE: CONCLUSION

5.1. General Summary of Thesis

The researcher presented the details of the study in the previous chapters of this thesis, but this chapter concludes the thesis. This section, therefore, summarizes the main findings of the research. Generally, there is a considerable number of studies on the connection between climate change and business. Through further reading, the researcher identified an area that warranted additional exploration – leading to this thesis. There is hardly any study that aimed at studying the interaction between businesses and climate change in Newfoundland; hence the central objective of this study was to appreciate business responses to climate change with the focus on the natural resource industry in Newfoundland. Based on this overarching objective, three research questions were investigated using semi-structured interviews. The following paragraphs highlight the main findings of this thesis with respect to the research questions.

Firstly, the research examined climate perceptions of some chosen organizations operating within Newfoundland's natural resource sector. According to the data collected, it was found that all the selected organizations believed in the existence of climate change and were aware of its impacts. It is essential to highlight this because several debates are ongoing regarding the reality of climate change. There is a growing number of individuals and organizations who are still skeptical about climate change, even though there is evidence of climatic events and disasters across the globe (see Chapter 2). According to this study, peoples' experiences and backgrounds played a significant role in the organizations' beliefs and concerns for climate change (see Chapter 2). In certain circumstances, the connection with climate change experiences enabled climate change actions from some of the selected companies. In fact, it was found that most of the companies have accepted their contribution to GHG emissions and were taking responsibility for

their actions. Regarding the companies' contribution to GHG emissions, transportation, equipment, and fuel use were the most significant sources.

The study also sought to ascertain the impacts of climate change on the selected businesses and whether it was perceived as a risk or an opportunity. Before conducting this study, the researcher identified a lack of literature on climate change impacts in Newfoundland's natural resource sector. This motivated the researcher to contribute to the literature by examining the effects of climate change on the selected firms. The main finding was that climate change impacts caused by extreme weather events affected the companies negatively. Firms confirmed that such events present a risk to their business. In some cases, companies were unable to operate for several days due to severe weather, which in the long run affects their profitability. However, a few of the companies indicated that climate change did not impact their operations in the short-term but foresee such impacts in the future. Aside from the extreme weather events, a significant risk highlighted by the companies was the enforcement of carbon taxes in Newfoundland.

On the other hand, some companies benefited from climate change through expanding markets to meet new demands. Also, a few companies were fortunate because their products are classified as "sustainable or green" by consumers – which boosted their revenue and sales. Even though a few of the companies did not enjoy any benefit from climate change, in the interim, they believed that a possibility exists to harness climate change opportunities in the future. These findings were consistent with the literature (see Chapters 2 and 4) and answered the first research question.

The second research question examined the extent to which isomorphic pressures influence the chosen organizations' climate change responses. The concept of isomorphic forces was borrowed from institutional theory, often used in organizational change and management literature

(see Chapter 2). This thesis innovatively utilized the concept of isomorphism by applying it to the business and climate change nexus. This approach has rarely been used by scholars, which makes this thesis a starting point for further research regarding applying institutional theory to businesses' climate change responses. This research showed that mimetic forces significantly influenced the firms' adopted actions and responses. For example, some of the firms followed other similar businesses on social media to copy their successful strategies with respect to climate change. Normative forces also played a role in the companies' responses, with coercive force being the least influential. The most significant finding was that the government of Newfoundland lacks specific climate change regulations and requirements to effect substantial emission reduction actions from companies. However, companies in Newfoundland's natural resource sector may adopt similar practices over time, creating an isomorphism, especially with appropriate regulations.

Lastly, it was encouraging to find that most of the chosen organizations were actively involved in reducing their GHG emissions (see detailed actions in chapter 4), answering the third question. This confirmed that businesses are recently concerned about climate change and are taking responsibility to combat the phenomenon. For this study, most of the companies were proactively finding ways to reduce their emissions through innovation, measuring, and reporting of GHG emissions. Even companies that did not have the financial muscle to innovate their processes to adapt to climate change, still considered it in their planning. In conclusion, climate change is a complex issue with several implications and consequences for governments and businesses. Therefore, firms' responses to mitigate climate change impacts should be applauded and encouraged to aid in the fight against the problem. Based on the findings of this research, there are lessons that need to be learned leading to the recommendations for the study.

5.2. Recommendations

Having highlighted the key findings from the research, three recommendations are suggested to conclude the study:

- ***The need for government action***: At the national level, businesses' response to climate change policies in Canada has been topsy-turvy. Initially, most companies in Canada were against climate change regulations, but a few years later, companies were advocating for climate change policies (Eberlein and Matten, 2009). This led to regulatory uncertainty and lobbying from companies to play a role in formulating climate change policies. Eberlein and Matten (2009) stated that in a report by Carbon Disclosure Project in 2007, large Canadian corporations indicated a need for government action in respect to climate change. This research has shown a similar situation where most companies implied a lack of specific climate change requirements and regulations in Newfoundland. It was also found that such requirements only exist when there is a mega project with the government's committed interest. There should be a shift in thinking to formulate policies that will affect all businesses to act against climate change. Policies can be in the form of taxes, regulations, and subsidies to drive adequate greenhouse gas emission reduction. For instance, the government can regulate the type of fuel and energy businesses should use for their operations. Detailed requirements of activities and processes within these industries should be well-defined. Currently, the Management of Greenhouse Gases Act in Newfoundland and Labrador applies to only large industries emitting 15,000 tonnes of CO2 in a year. This can be changed to comprehensively include all industries (including small to medium businesses) emitting substantial amount of GHGs into the atmosphere. Also,

there should be incentives for emission reduction technologies to induce more companies to innovate their processes.

- ***Private sector engagement in climate change adaptation:*** Most studies have found that companies focus more on climate change mitigation than adaptation. This thesis has also confirmed this trend. Therefore, companies in the natural resource sector of Newfoundland must begin to engage in climate change adaptation. Climate change adaptation is an expensive venture, so the support from businesses will enable the government to implement more adaptation measures. More specifically, businesses should liaise with the government, municipalities, communities, and universities in developing climate change adaptation solutions. Such partnerships can foster ideas which can be implemented within companies and communities across the province – increasing adaptation efforts. Furthermore, companies can derive benefits and opportunities from climate change adaptation by developing climate-proof products, improving processes and services (see Islam and Mohd-Nor, 2018). Additionally, industry associations such as the Newfoundland and Labrador Forest Industry Association and other non-profit organizations can provide a platform for businesses and communities to network and discuss climate change issues and help communities build capacity to adapt to climate induced impacts. A typical example of a not-for profit organization empowering communities to address climate change impacts in Newfoundland and Labrador is Conservation Corps Newfoundland and Labrador.
- ***Increase research on climate change impacts in the natural resource sector:*** The natural resource sector is an important sector that needs attention for two reasons. First, it contributes significantly to the economy of Newfoundland and employs many people. Second, it is a vulnerable sector that is sensitive to climatic conditions. Having outlined the

reasons, it was found that there is limited research on climate change impacts in the natural resource industries. This implies the need for increased research in the area to ensure that the province benefits from this sector. This can be done through government funding on projects that seeks to identify current and future climate impacts. Also, the industry players and researchers in academia should investigate some of the climate change impacts in Newfoundland. A major research question that could be investigated is: how is climate change impacting industries within the resource sector in Newfoundland and Labrador? This question will help identify some of the impacts faced by industries such as mining, forestry, oil and gas, energy, etc. An in-depth study (qualitative research approach) can be utilized in investigating the issue by interacting with stakeholders (employers, employees, shareholders, government, community). Using such an approach will be distinct from this thesis because more details will be captured as researchers engage all stakeholders and focus only on impacts – which this research did not do. In such a study, researchers can explore specific questions such as: what are the observed impacts? What are the potential impacts? How have the impacts been addressed? What were the challenges? Are there any workable solutions? How can effective capacity be built to adapt to the impacts?

5.3. Conclusion

This thesis has shown that businesses are vital in solving climate change. The companies studied were actively involved in mitigating their GHG emissions – because they recognize climate change as a problem for both businesses and governments. The most important finding of the research was the lack of specific climate change regulations in Newfoundland and Labrador. This has made the thesis valuable in identifying a policy need and suggesting recommendations for a

possible consideration. Also, this research can help set the pace for further research around business and climate change in Newfoundland – especially in the natural resource sector. Therefore, the researcher hopes that the recommendations of this thesis will be considered and spark more of such studies in Newfoundland and Labrador.

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APPENDICES

A. Informed Consent Form

Title: Business responses to climate change: A case study of selected organizations in Newfoundland.

Researcher: Edward Oteng Asante, principal investigator, eoasante@grenfell.mun.ca

Supervisors: Dr. Garrett Richards, co-supervisor, grichards@grenfell.mun.ca. Dr. Sadia Jahanzeb, co-supervisor, sjahanzeb@brocku.ca

This form is part of the process of informed consent. Please take time and read this carefully and understand the information given to you. Please contact the researchers if you have any questions about the study or would like more information before you consent. If you choose not to take part in this research or if you decide to withdraw from the research once it has started, there will be no negative consequences for you, now or in the future, and answers that might have been given will not be used without your consent.

The overall objective of the research is to better understand business responses to climate change. Some of the broad topics to be discussed include

- Background
- Climate change impacts
- Climate change responses
- Factors influencing actions on climate change

You are receiving this consent form because you expressed preliminary interest to participate in this study. Your participation involves an interview by the researcher, and it is estimated to take approximately 30-60 minutes. The data collected will be analyzed and used entirely for academic purposes. By aggregating the data, both your privacy and confidentiality

will be maintained. Your name and position in the organization will be anonymized. The interview will be conducted through phone calls or virtual platforms such as Skype. The audio of the interview will be recorded. Data collected will be stored in a secured, locked-up, and password-protected device. Also, general attributions will be used instead of names. for instance, where participants' comments may be quoted, general attributions like "Respondent A said...." will be used instead of names or specific roles that could identify the participant. You will be sent an audio copy of the recording for your interview (for your records or in case you want to adjust your comments) through a secured file-sharing system like one drive which will be accessible by you and the researcher. At the conclusion of the study, the data will be transferred to the supervisor's protection. Data will be destroyed via triple deletion (delete, empty/purge deletion folder or "recycle bin", delete any back-ups) after five years.

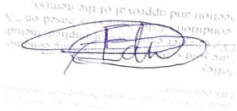
There are no obvious risks associated with your participation in this research. Your participation is entirely voluntary, and you have the right to withdraw at any point during the data collection and even after the interview up till July 2021, where most of the data would have been analyzed.

The proposal for this research has been reviewed by the Grenfell Campus Research Ethics Board (GCREB) and found to follow Memorial University’s ethics policy. If you have ethical concerns about the research, such as the way you have been treated or your rights as a participant, you may contact the GCREB by email: gcethics@grenfell.mun.ca or by telephone at (709) 639-2736

Please sign to indicate your consent to participate in the study as outlined above.

Signature of Participant

Signature of Principal Investigator



B. Interview Guide

Semi-structured interview ~30 to 60 minutes

Introduction

The purpose of the research is to better understand business responses to climate change. Through this interview, I hope to learn more about climate change risks and opportunites on businesses and the responses adopted to address climate change. Some questions may require a follow-up question. Do you have any questions before we begin?

Consent: A consent form has been sent to the interviewee.

Interview questions

1. Background

-Tell me a little bit about the organization. Describe your role with the organization.

-What is your organization's general perspective on climate change?

-In what ways does your organization contribute to greenhouse gas emissions?

2. Climate Change Impacts

-What changes in climate conditions have been observed by your organization?

-What risks does climate change pose to your organization?

-What opportunities does climate change bring to your organization?

3. Climate Change Responses

-What climate change adaptation actions are being implemented by your organization?

-What actions are being implemented by your organization to reduce greenhouse gas emissions?

4. Causes of Action

-Have any actions been adopted from another organization?

-Have any actions been adopted due to discussions and norms in professional networks and connections?

-Have any actions been adopted because of regulations or guidance from government authorities?

5. Other

-What other comments would you like to share?

C. Recruitment Text

Subject

Invitation: Interview for Masters thesis on Business and climate change: A case study of selected organizations in Newfoundland.

Initial text

Dear [name of potential participant]

My name is Edward Oteng Asante, a Masters student studying Environmental Policy at Memorial University, Grenfell Campus. I am currently working under the supervision of Dr. Sadia Jahanzeb and Dr. Garett Richards of Environmental Policy Institute at the Memorial University, Grenfell Campus, on my Masters thesis entitled "Business and climate change: A case study of selected organization in newfoundland." The purpose of this research is to understand better business responses to climate change by exploring the perceptions on climate change, strategies adopted to address climate change, and the factors influencing their actions.

I am looking for participants who are currently working with the organization and know much about responses taken to address climate change within the organization. I would like to formally invite you to participate in a short interview about your interest and experiences with climate change responses within the organization.

The interview will be conducted remotely, either on phone or virtual meeting, depending on participant preference and would be approximately 30-60 minutes. There are no risks associated with your participation in this research.

Please reply to this email (eoasante@grenfell.mun.ca) to express your interest. Upon reply, I will provide you with further information and schedule a short meeting at your convenience.

Follow-up text for positive response

Dear [participant's name]

Thank you for accepting to participate in this research work. I have attached a consent form with more information about your participation in the interview. You can review it and ask questions, if you have. Your participation is entirely voluntary, and you have the right to withdraw at any point in the data collection and even after the interview up till April 2021, where most of the data would have been analyzed. You can sign the consent form electronically. Note that you have the option to provide us with additional materials for the research before or after the interview.

If everything looks acceptable, I would like to schedule a time for the interview. In this case, the interview will likely be [by phone/ virtual]. My availability is [describe availability in the near future]. Please let me know what time would be most convenient for you and which one (phone or virtual) you will be comfortable with.

Thanks again!

D. Ethics Approval

GRENFELL CAMPUS | MEMORIAL UNIVERSITY
Research Ethics Board
University Drive, Corner Brook, NL Canada A2H 5G4
Tel: 709-639-2399 Fax: (709) 637-2885 http://www.grenfell.mun.ca/research-ethics-board

February 17, 2021

Reference number: **20211381**

Dear Asante Edward,

Thank you for your application for ethical clearance for your proposal ***Business and climate change: A case study of selected organizations in Newfoundland***. The Grenfell Campus Research Ethics Board (GC-REB) has reviewed the modifications to your application and finds this application in ethical compliance with the Tri-Council Guidelines.

Your approval for this project expires on date of our previous letter. To remain in compliance with Article 6.14 (Continuing Research Ethics Review) of the Tri-Council Policy Statement on Ethics in Human Research (TCPS2), should your project continue past that date, you are required to renew your ethics approval before that time. As well, please note that any changes to the proposed study will need to be cleared by the GC-REB first.

The Board wishes you success with your research.

Best wishes,

John Bodner, Ph.D., Chair

IMPORTANT REMINDERS – PLEASE READ:

Important Notice regarding COVID-19: As the situation changes and develops with COVD-19, it is up to the PI to ensure that the research team remains in compliance with Memorial's current status on in-person data collection. You can follow information on the current status of policy here: https://www.mun.ca/research/.