

Organizational Resiliency and Small and Medium Enterprises in New Zealand

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by
Joel Brunzell

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Report submitted to:

Michael Elmes, Ph. D.
Professor at The Business School
Worcester Polytechnic Institute

Ingrid Shockey, Ph. D.
Professor at the Global School
Worcester Polytechnic Institute

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Abstract

This MQP relates to Small and Medium Businesses (SMEs) in New Zealand, and how climate change is impacting or could impact these businesses. Interviews were conducted with owners and managers of local SMEs in the Wellington, New Zealand region to determine the current state of SMEs in light of climate related impacts.

Through coding data from interviews and finding common themes, recommendations are made to SME leaders in this project on how to be more organizationally resilient in the face of climate change.

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I would also like to thank Professor Michael Elmes for his guidance and recommendations throughout the entire process of this project, as well as giving me the opportunity to come to New Zealand in the first place. I doubt that this project would have gone very far without his insight, knowledge on the New Zealand area, and overall confidence in my ability.

1.0 Introduction

Small and medium enterprises (SMEs) are typically defined as organizations that have less than 250 employees working for the organization (Megan Ayyagari et. al, 2007, p. 416). As these businesses are smaller in terms of size, capital, and infrastructure than their larger counterparts, making change in the face of threats and opportunities can be more of a challenge for SMEs. Along with this, most SMEs have a limited scope and are focused on their typical business processes, along with conducting enough business to keep the lights on. When large climate events, such as cyclones, thunderstorms, and earthquakes occur, SMEs need to be resilient and prepared for various outcomes. Climate change impacts can be devastating to SMEs due to narrow focus and unpreparedness for these types of events. The question becomes, how can SMEs become more resilient in the face of climate change?

To find the answer to this question, multiple objectives had to be achieved. First, several SME leaders needed to be interviewed in order to gather a wide range of data from several different types of organizations. Open ended interviews allowed for SME leaders to provide detailed responses, regardless of their type of organization. Once the data was collected, it was transcribed, summarized, and coded in order to determine common themes across SMEs. Finally, these themes served as the basis for making recommendations to SMEs on how to handle climate related issues with greater resiliency and efficiently.

2.0 Background & Literature Review

2.1 Climate Change

As the world continues to change, humans need to adapt in order to survive. A new challenge that is facing us is climate change, which is causing unexpected and rapid changes to weather patterns across the globe. This has had several side effects, such as health impacts, rising sea levels, more frequent natural disasters, and impacts on business operations.

Climate change is defined as, “[the] long-term shifts in temperatures and weather patterns” (United Nations, 2023). The climate across the globe has been changing since the formation of the planet, going from uninhabitable to full of life due to perfect conditions in our solar system and our planet. Although the Earth’s climate has been steadily changing for millennia, the rate has increased in the recent past. It is widely believed and that the drastic recent changes in the global climate are due to human activity. As stated by McCracken (2019), “The largest warming influence is resulting from the increase in CO₂ concentration due to combustion of fossil fuels and deforestation and soil disturbance” (p.13). This increase in fossil fuel use from transportation, mining, construction, and energy production has led to the vast release of CO₂, which in turn holds excess heat in the atmosphere. McCracken (2019) notes, “According to the most recent data, the global average surface air temperature has increased nearly 1°C since the mid-nineteenth century, and suggestions of a break in the rate of warming during the first decade of the twenty-first century have proved mistaken” (p. 15).

As climate change is an issue that is going to last for the foreseeable future, businesses need to prepare for these events to keep their businesses operational. An example of impacts from climate change can clearly be found in New England. Modern Pest Services states, “While the threat of tick-borne disease is usually associated with spring and summer, ticks are now a year-round problem in New England. This is attributed mainly to climate change” (Telegram & Gazette, *Ticks are becoming a year-round issue in New England*, 2023). The article explains that due to warmer temperatures in the winter than in the past, ticks no longer have to lay dormant in the winter. These changes may be harmful to businesses that specialize in outdoor activities in the winter, such as Christmas Tree farms.

The change in surface temperature is another climate factor that needs to be addressed. As seen in the below in Figure 1, the global surface temperature from a combined land and water perspective has risen drastically since 1950. It is also important to note that some regions have increased in temperature by as much as 2.5 degrees Celsius (The Intergovernmental Panel on Climate Change, 2012). These temperature changes can have large impacts on business, such as sea level rise for coastal businesses and increased health risks for outdoor workers.

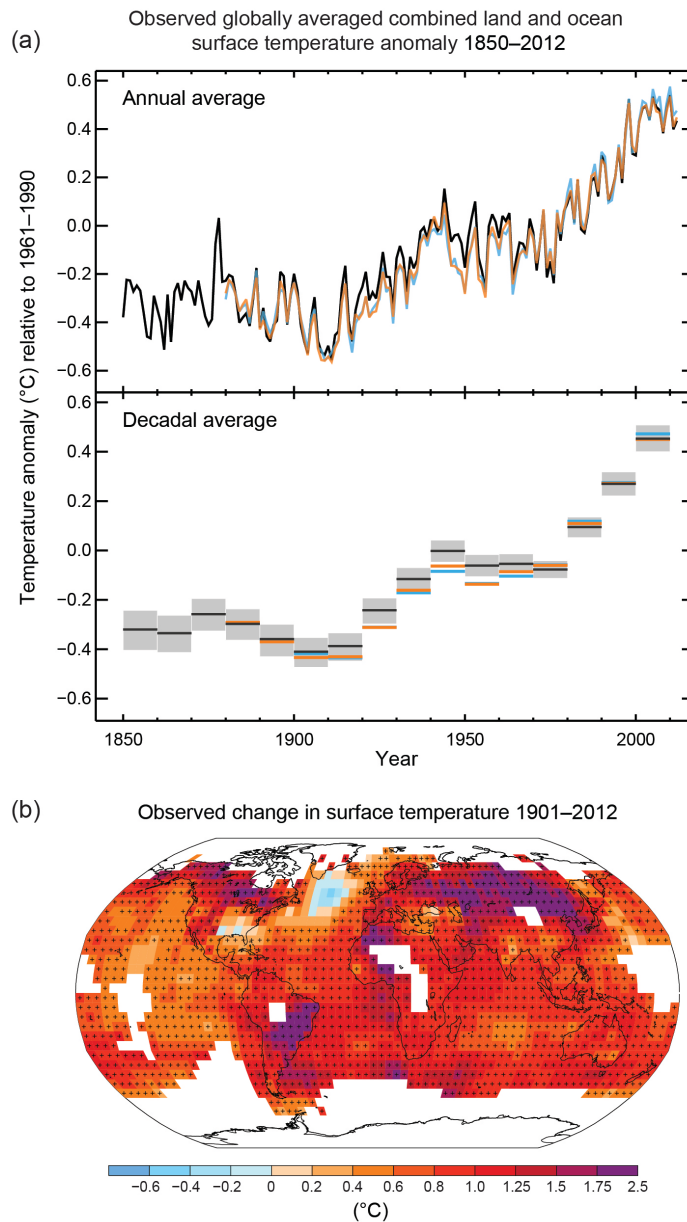


Figure 1 (The Intergovernmental Panel on Climate Change, 2012)

Bentham (1992) shares insight on how human health is affected by climate change. According to the article, an increased temperature across the globe will lead to more illnesses. Bentham (1992) states, “As well as the direct effects of heat stress, adverse effects on cardiovascular health are likely, especially in vulnerable groups” (p.

8). These resulting illnesses will not only result in higher mortality rates across the globe (especially high in arid climates), but they will put a strain on health systems due to an increase in patients. Another health risk due to climate change is from water contamination. Fresh water is becoming a scarcer resource every day on Earth, and the effects of climate change may harm the fresh water supply further. The article discusses issues such as longer dry spells, which could result in long droughts for many people. A study of mountain-top water supplies suggests that once ice caps at the tops of mountains are completely melted and no longer produce runoff, there will be no more water in areas that rely on mountain water (Bentham, 1992, p. 10).

A point that was mentioned which is very important is water quality. As stated by Bentham (1992), "Lack of sufficient quantity of household water is also a major problem leading to poor personal and food hygiene which are at the root of many watershed diseases" (p. 10). As the climate continues to change and water becomes scarcer in the future, watershed diseases will only continue. In combination with heat-related health problems, climate change may be responsible for many deaths in the future.

Other than human health, climate change has several other important negative impacts. One of the most prevalent is sea level rise, which has an impact on several nations and coastal cities (Bosello et. al, 2013, p. 2) According to the Intergovernmental Panel on Climate Change (IPCC), sea levels are projected to rise between 0.18 and 0.59 m by the year 2100 (Bosello et. al, 2013, p. 2). This rise in sea level is responsible for, among others, higher flood risks, loss of wetlands, and larger storm surges in coastal areas. Not only does this cause issues for humans in their day-to-day

lives, it also harms ecosystems close to the coast. Along with higher sea levels, there is evidence to show that the oceans are getting warmer over time. Armstrong et. al writes, “In 2017, warmer and wetter atmospheric conditions and warmer ocean temperatures intensified Hurricanes Harvey, Irma, and Maria in the eastern United States, while dry weather exasperated the California wildfires - all the result of a warming planet” (Armstrong et. al, 2018, p. 8). These impacts of a warmer Earth will only continue to get worse as the climate continues to change.

As the climate changes, businesses will have to increasingly keep the threats involved with climate change in mind. If businesses are not prepared for these events, they can be caught off guard and face large impacts to their business. One way to prevent these unexpected changes is future-proofing. As defined by BitCot, “future-proofing is a process of anticipating and preparing for potential future challenges, in order to minimize their impact and ensure long-term success” (2023). For the purposes of this paper, we will look at future-proofing efforts in terms of preparedness for climate change related impacts. An example of how future proofing can be applied to a business is through proactivity and innovation (BitCot, 2023). In terms of climate change preparedness, proactivity would be looking at current climate trends, and anticipating any changes in the future that could have a major impact on the business. As example of this would be noticing that the business’ location is frequently in the path of large storms. Because the business is aware of this phenomenon, the business could anticipate future storms earlier, whether that be by retrofitting the building with better flood drains or making sure that vital equipment is protected from the storm.

While some damages may occur to the business, the business would be better off from future proofing and minimizing any potential threats before they happen.

Another example provided by BitCot on how to future proof a business is through planning and attention to detail (2023). While planning could be similar to proactivity in when discussing preparing for climate change related incidents, attention to detail is a separate matter. If you are aware of climate related events that have affected your business in the past, you can make note of how the event impacted the business. Whether it be property damage, the ability for employees to come in to work, or supply chains affecting your daily operations, businesses can learn from past experiences and anticipate similar threats in the future. This allows for the impacts to harm the business less, as the business is aware of the potential outcomes of these impacts.

While these changes to the climate will have impacts on all of us, Small and Medium Enterprises (SME's) are an area where attention is often not given. Due to the leaner financial status of these businesses, it may be more difficult for them to implement preparedness plans for climate change related issues. In this project, we will look at the impacts of climate change, how SME's are affected, and how SME's in New Zealand are preparing for the future of climate change.

2.2 Small & Medium Enterprises

A Small and Medium Enterprise (SME) is an organization that is not as large or competitive as a large corporation such as Apple. Megan Ayyagari et. al (2007) writes, "Some of the commonly used criteria are number of employees, total net assets, sales, and investment level. However, the most common basis for this definition is

employment” (p. 416). They specify the cut-off as typically 250 employees or less, yet these criteria have different ranges based on where you are in the world. Since this project is taking place in New Zealand, it is important to state how New Zealand agencies and academics define an SME. In New Zealand, small firms are defined as having 0-20 employees, medium firms 21-50 employees, and large firms more than 50 employees (New Zealand Foreign Affairs & Trade, n.d).

SME's face larger challenges than their larger counterparts due to access to resources, such as income, personnel, and capital. Major companies like Apple have the means to reduce their carbon emissions and respond to the impacts of climate change. If larger companies do not care about cutting emissions, then they will disproportionately add to the worsening climate. This can take a toll on many SMEs, as they will have to make preparation for climate related impacts usually with fewer resources or expertise.

According to The World Bank (which defined SME as 250 employees or fewer), 90% of businesses globally are SME's (World Bank, 2023). Many SME's do not have the time or resources to worry about climate change, as they are worried about keeping their operations running smoothly and functionally. To see how climate change impact SME's in practice, Chhom et al. (2020) conducted a study in Kratie, Cambodia. In their study, they interviewed 32 micro-businesses (1-10 employees by their definition) between January and February of 2019 (Chhom et al, 2020, p. 3). These interviews were designed to collect data on how climate change has affected these businesses. They found that, “Respondents perceived both extreme weather events (or natural hazards) and climate change as affecting their businesses” (Chhom et al., 2020,

p. 3). Respondents also mentioned the frequency and severity of storms and climate change when responding to these questions. When interviewed, many participants mentioned flooding as a true impact on business. The range of impacts included, “reduced number of clients, cutting-off of production chains, loss of profits, and disruptions to business growth” (Chhom et. Al., 2020, p. 4). It should be noted that some participants mentioned positive impacts from floods, such as a woman selling items out of her boat.

Other negative impacts from climate change included temporary closures, relocations, and disruption to the production of goods or services (Chhom et. Al., 2020, p. 6). When looking at these effects, it was clear how a small group of 32 businesses had been impacted by climate change. Although finding solutions here may be achievable, imagine the complexity when discussing an entire nation, like New Zealand.

2.3 Small & Medium Enterprises in New Zealand

According to the Ministry of Business, Innovation & Employment of New Zealand (2023), “[Small companies are] defined as those with fewer than 20 employees”. As previously mentioned, in New Zealand medium businesses are from 21-50 employees, and large firms are over 50 employees. The “Small and Medium Business in New Zealand; Report of the Small Business Development Group” (2015) mentioned that New Zealand had 9,459 medium businesses at that time, and that there were 487,602 small businesses in New Zealand (NZMBIE, 2015). This is a staggering number, as in 8 years that number had grown by 58,393 companies. As of 2023, “There are

approximately 546,000 small businesses in New Zealand representing 97% of all firms” (NZMBIE, 2023). It should be noted that the website states that this amounts to only 29.3% of the national GDP, or about or .0052% of GDP per company. Specifically, from 2014 to 2015, over 1,600 new small businesses were formed. This shows that the increase in small companies may be a more recent phenomenon, as we would expect there to be 7,299 new businesses each year on average.

This increase in small businesses in New Zealand is what led to the formation of the Small Business Development Group in 2003. This group was formed to, “develop a strategy to help small businesses learn how to compete in the federal market” (Small Business Development Group, Inc., 2023). As this group has met with the government multiple times, they have already suggested approaches to the New Zealand Government prior to their 2015 meeting. Some of the topics that were discussed with the government of New Zealand prior to the 2015 report included, “Better use of information and communication technologies by small business, cyber security of small business, Government Procurement of small business, Investment Law, Research and Development grants, and Tariff and non-tariff barriers to export” (Small Business Development Group, 2015, p. 2). By coming together and forming a group to make their collective thoughts heard, these small businesses were able to communicate with the government and advocate for better business practices more efficiently.

While this was a very important start for small businesses in New Zealand, there are still steps that need to be taken, particularly with respect to climate change and its impact on small businesses. Researchers are beginning to note the impacts of climate change in New Zealand. Allen et al. (2022), discuss the issue in their article *Adapting to*

Avoidable and Unavoidable Climate Change; what must Aotearoa New Zealand do?. As shown in Figure 2 below, there are several observed changes already taking place (Allen et. Al, 2022, p. 53).

Table 1. Changes since the last IPCC assessment in New Zealand

| Observed changes and impacts | Examples |
|--|--|
| Ongoing climate trends have exacerbated many extreme events. | Further warming and SLR, more hot days and heatwaves, less snow, more rainfall in the south, less rainfall in the north and more extreme fire weather in the east. |
| Climate trends and extreme events have combined with exposure and vulnerabilities to cause major impacts for many natural systems, with some experiencing or at risk of irreversible change. | In the Southern Alps, from 1978 to 2016, the area of 14 glaciers declined 21%, and extreme glacier mass loss was at least 6 times more likely in 2011 and 10 times more likely in 2018 due to climate change. |
| Climate trends and extreme events have combined with exposure and vulnerabilities to cause major impacts for some human systems. | Socioeconomic costs from climate variability and change have increased. Extreme heat has led to excess deaths and heavy rainfall has increased rates of serious illnesses. Nuisance and extreme coastal flooding have increased due to SLR superimposed upon high tides and storm surges in low-lying coastal and estuarine locations, including impacts on cultural sites, traditions, and lifestyles of Tangata Whenua Māori. Droughts have caused financial and emotional stress in farm households and rural communities. Tourism has been negatively affected by poor ski seasons and receding glaciers. Governments, business, and communities have experienced major costs associated with extreme weather, droughts and SLR. |
| Climate impacts are cascading and compounding across sectors and socioeconomic and natural systems. | New types of risks have been generated, exacerbating existing stressors and constraining adaptation options e.g., cascading effects of disruption of interdependent systems and infrastructure in cities and settlements due to heavy rainfall events, SLR, groundwater rise, and heat. |

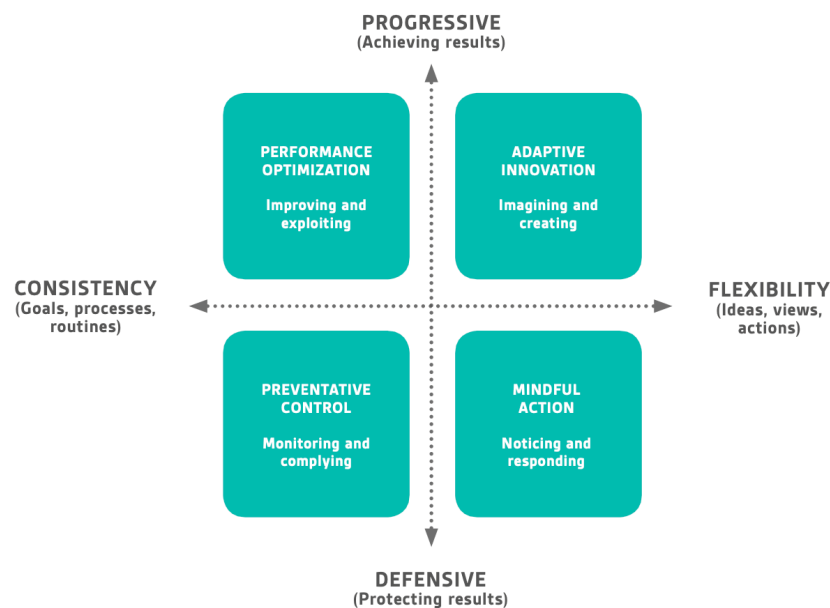
Figure 2, Allen et. Al, 2022, p.53

The article makes important notice of projected future impacts, such as increasing climate risks making current vulnerabilities worse, along with climate trends leading to increasingly more severe weather events in the area (Allen et al, 2022, p. 53). Seeing the economic impacts of these changes is startling. “Floods in New Zealand resulted in at least NZ\$140 million in privately insured damages from 2007 to 2017, and two droughts alone that were attributable to climate change cost NZ\$800 million” (Allen et. Al, 2022, p. 54). As more severe weather systems affect these regions, the value of

damages will only increase. In order to prepare for such disasters, SME's in New Zealand need to become more organizationally resilient.

2.4 Organizational Resilience

Organizational resilience can be thought of as two types of behavioral strategies: defensive and progressive behavioral strategies. A defensive behavioral strategy focuses on, “stopping bad things from happening”, and a progressive behavioral strategy tries to make “good things happen” (Denyer, 2014, p. 10). These behaviors create tension between each other, as do the behavioral strategies of consistency and flexibility. Consistency means staying with your typical processes and routines, while flexibility emphasizes an organization’s ability to adapt and pivot more easily. A conceptual model of these factors can be seen below in Figure 3 (Denyer, 2014, p. 10).



As stated by Denyer (2014), “Resilient organizations take precautionary measures in the face of potential problems” (p.11). For example, organizations can have training for employees to prepare them for potential issues, or they can design their in person locations to better withstand climate related events. Denyer (2014) also mentions how precautionary measures tie directly into ecological challenges that may affect a business. Denyer (2014) notes, “Studies of ecological challenges have emphasized the need for organizations not only to guard against failure but also to absorb and recover from the disruptions” (p. 11). From this, we can say that resilient businesses would fall under the “mindful action” quadrant of Figure 3. This is because guarding against failure would be considered as a defensive behavioral strategy, and absorbing and recovering would be a flexibility-related behavioral strategy.

When thinking about climate change, we can identify many potential problems. Personal health, supply chains, sea level rise, and stronger storms are just a few examples. Although taking precautionary measures in these areas would be ideal, SME’s have fewer resources to work with in response to the challenges of climate change. A study by Gittell et al. (2014), found that “firms with the greatest financial reserves, and that had avoided high levels of debt prior to the event, were able to return to and surpass previous levels of performance without resorting to layoffs” (Denyer, 2014, p. 11). Having more capital and financial reserves makes it easier for organizations to take mindful action, as it allows for organizations to invest in absorbing and recovering more freely.

An example of this would be if there was a flood at a local restaurant. If the organization was tight on capital, they may have to wait an extended period to repair the building, or they may have to lay off some of their employees. By laying off employees, they can take what they would have been paid and put it towards repairing the restaurant. But the restaurant will likely be understaffed when they return to operation, which puts additional stresses on the organization. If a restaurant had more financial reserves, then they would be able to repair the flooded restaurant without having to let go of their workers. This would take a chunk of the reserves, but it would also mean that they are able to act faster than a restaurant without reserves. This means they can get back to normal operation sooner and start recuperating the capital spent on repairs. They also would not have the additional stresses of being understaffed, which would allow for things to go back to normal once they reopen. As SME's have up to 50 employees in New Zealand, layoffs may result in serious changes to the ways these businesses operate after events take place. If the businesses do not have enough funding even after layoffs, bankruptcy is the likely outcome.

One way that businesses can remain resilient in the face of adversity is to give employees more control over their day at work. This practice would fall into the mindful action quadrant as well, as the employees would be able to protect results while also taking actions and creating ideas on how to prevent catastrophes. "As individuals gain control over key task behaviors and exercise discretion in performing those actions, they develop a sense of efficacy and competence. As a sense of competence increases, individuals are better able to respond effectively in unfamiliar or challenging situations and persevere in the face of failures and challenges" (Denyer, 2014, p. 13).

This will allow for employees to gain a deep understanding of their process, so if changes occur, they will be knowledgeable on the process and will be more able to adapt. This increases the overall organizational resilience, assuming that all employees are knowledgeable about their roles.

An example of this would be in a manufacturing plant that uses harsh chemicals. If employees were working in an assembly line and has one small, repetitive task, then they would only be aware of the potential hazards related to their step in the process. A resilient organization would allow for employees to have opportunities to move around the assembly line to gain a deeper understanding of the entire process. This would be very valuable in case of a climate related event, such as a flood. If a flood were to come through the facility, employees would be aware of what risks would come at every step of the process. An example would be knowing which chemicals used in the assembly line would have an adverse reaction to water. This gives the employees a chance to store these chemicals in a location where they will not get in contact to water, saving the business from having to repair the workspace from an explosion. Another example would be avoiding building new locations near coastal areas, and anticipating sea level rise in the future.

While these are just a few examples, there are other examples where organizations can be resilient in the face of climate change. An example provided by Denyer (2014) highlights how a strong leader can make organizations resilient in the “performance optimization” quadrant in Figure 3 (p. 14). He states that, “Optimization often involves formalized structures for authority and decision-making, a focus on internal integration through planning and coordination of operations, resource

allocation and structuring tasks” (p. 14). Through this coordination of operations, large scale plans can be procured by leaders to make sure that everyone is prepared when a change happens in the organization. Leaders can achieve this preparedness by, “helping followers understand role and task requirements, providing answers, creating and using rewards and reinforcement, and intervening when best practices are not met” (Denyer, 2014, p. 14). Through informing and rewarding workers for doing things the right way, and preparing them for changes, organizations can be resilient in performance optimization. While training and preparing can take time to accomplish, it is another low-cost implementation that SMEs can provide to their employees.

It should be noted, however, that the various segments of organizational resilience pull on each other, and that “a preoccupation with one particular dimension could create blind spots that can impair Organizational Resilience” (Denyer, 2014, p. 16.) An illustration of this phenomenon can be seen in Figure 4 below.

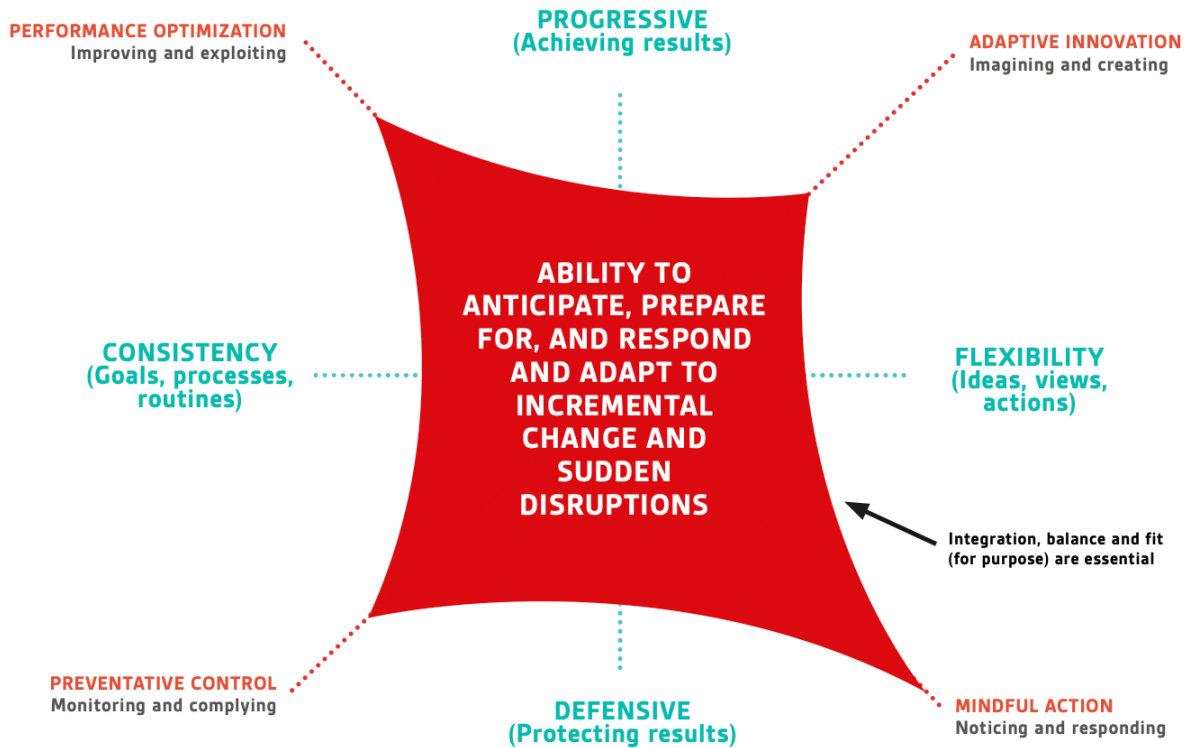


Figure 4, Denyer, 2014, p. 16

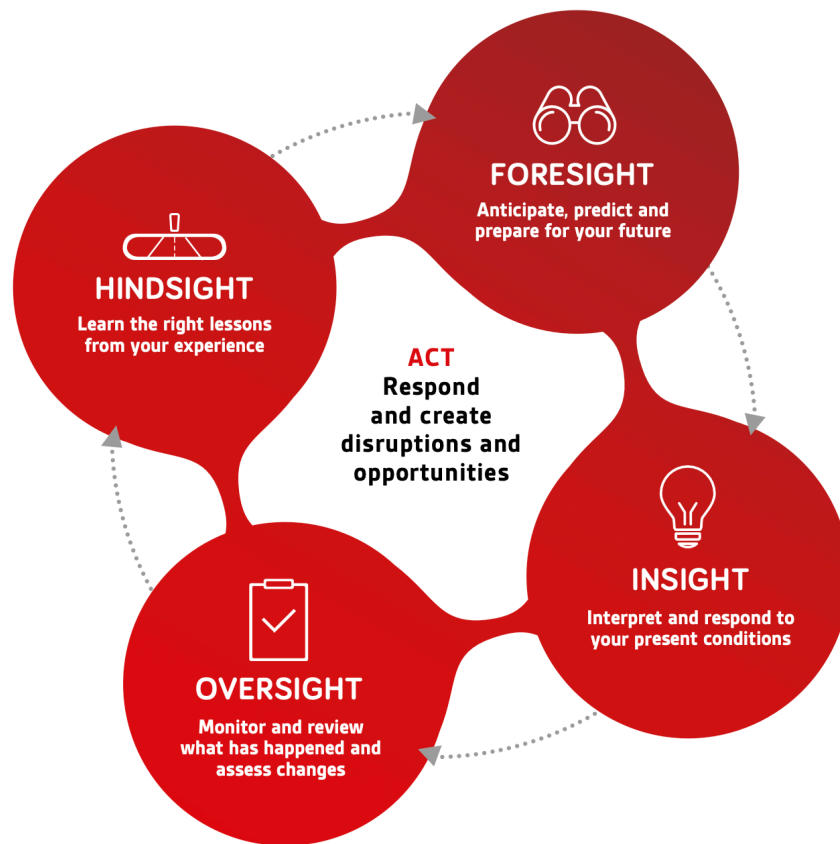
To explain this phenomenon, assume that an SME is focused on being strategically consistent (typical processes and routines) and defensive (“stopping bad things from happening”). As shown in the figure above, organizational leadership will tend to focus on the bottom left quadrant of the figure, meaning that they emphasize monitoring and complying with their normal business practices. As they are focused heavily on the bottom left quadrant, they are more vulnerable in the other three quadrants. The three quadrants not attended to are “noticing and responding,” “imagining and creating,” and “improving and exploiting” (Figure 4). If something new were to occur for this business, such as a flood at their facility, they may not have enough “mindful action” (bottom right in Figure 4) towards the flood as they should. The organization may not notice and respond to the flood adequately, as the organization is used to monitoring and complying with their current practices instead of

adapting. If SMEs do not expand their focus to include all sections of the figure, then it is more likely that issues will arise in the future. It should be noted that due to small scopes of SMEs and lack of capital, most if not all SMEs face these challenges. It can be difficult for them to expand their scope and take every aspect of the business into account. A lot of SMES focus on day-to-day activities and keeping production running smoothly, which can cause blind spots to occur in other areas. While these issues are damaging to SMEs, the fact that they have a smaller focus does make them more flexible than their larger counterparts. An example of this would be the fact that it can be easier for SMEs to move locations if a climate threat like sea level rise were to impact their business. Along with this, a smaller work force makes it easier to align the thoughts of the entire organization.

A new methodology, “which provides a leadership agenda for Organizational Resilience” introduced by Denyer is the 4Sight methodology, which consists of the steps “foresight, insight, oversight, and hindsight” (2014, p. 20). A visualization of this process can be seen below in Figure 5.

Figure 5, Denyer, 2014, p.20

Foresight is defined as, “Anticipate, predict and prepare for your future” (Denyer, 2014, p. 20). This can be an outward focus or an inward focus, as you could prepare for a storm coming or prepare for an employee to depart the company. This step mainly involves scanning your surroundings and making sure that nothing unexpected will arise in the future. Insight is defined as, “Interpret and respond to your present conditions” (Denyer, 2014, p. 21). This is an important step in determining the current



state of the business, such as comparing different segments, clarifying challenges, checking for internal patterns, and encouraging employees to bring their issues or concerns forward. This step makes sure the entire business is aligned and trying to achieve the same goal. Oversight is defined as, “Monitor and review what has happened and assess changes” (Denyer, 2014, p. 21). This step involves looking over business performance, how the business is acting in relation to the mission of the business, managing deviations in systems, and checking the system tolerance for failure levels. In short, this step ensures that businesses are performing at the best of their ability, while striving to achieve their mission. Finally, hindsight is defined as, “Learn the right lessons from your experience” (Denyer, 2014, p.22). This step is rather self-explanatory, as this step revolves around making changes based on past

experiences. As an example, if one of your suppliers has missed shipment times multiple times, you may learn that this supplier may not fit well in your current system. Of these steps in the 4Sight system, insight is the only step where true investment will be required. This is because the step includes responding to current conditions, which may require capital for research and development, or infrastructure. Between balancing behaviors and consistently checking on best practices and systems, SME's can embrace organizational resilience to overcome any issues that may arise.

2.5 Conclusion

Over time, we have become more aware of the impacts of climate change on our lives. These impacts are not always noticed by business leaders, particularly in SMEs. Although steps are being taken in New Zealand to spread awareness of the struggles of SMEs through the Small Business Development Group, there is still work to be done. Specifically, SME leaders need to be prepared and resilient in the face of adversity from climate change related impacts. Through our methodology, we intend to find out how current SMEs in New Zealand are preparing for climate change and how that maps onto becoming more resilient.

3.0 Methodology

To begin the search for SMEs in New Zealand to interview, I was provided with a list of over 50 SMEs in the country. This type of sampling is known as convenience sampling, as I went through the list looking for companies who I thought would be a good fit for the interview. The main criteria I looked for were the fact that they were local, small, and if they had information about the company on their website. If they did, then it was easier to learn about the organization, and if they have ever done work with outside sources in the past. This provided a good base for me to reach out to and allowed for me to look into these organizations and learn a little about them before the interviews. From the list, I found emails on most of the company websites and sent out an invitation for an interview.

These interviews were conducted either over Zoom or in-person at the organization. Regardless of the format, the interviewees were asked the same 10 questions (See Appendix A). Interviews were conducted to allow more open-ended responses and deeper insight into specific issues that may be affecting these companies. These issues could be very company-specific or broader. By gaining an understanding of what specific companies and industries may need in terms of responding to climate change, I was able to paint a picture on SME leaders are framing climate change and how they might improve their responses.

For all interviews conducted, I took notes live during the interview on a spreadsheet. This was to remember important details, along with recording answers to the 10 questions asked to interviewees. The spreadsheet was important for analyzing

the data, as I could see all the responses across interviewees for a given question. This made it easier to pick up on patterns and make connections between the data.

When interviews were conducted over Zoom, the meetings were recorded after receiving permission from the interviewee. With the recorded audio, Zoom also provides the organizer with a written transcript of the full meeting. As this transcript is often not accurate, I had to go through the audio of each interview and compare it to the transcript, making corrections where needed. The raw data for these transcripts can be found in Appendices C, F, H, and I. As for interviews that were conducted face to face, just the spreadsheet was used. Although there are not full transcripts for these interviews, a longer breakdown that adds more details to the notes taken can be found in Appendices B, D, E, G, J, and K below.

Because there were no predetermined categories for the data, an open coding method was used. Open coding is “a method where data [is] initially broken down and analyzed to identify concepts, categories, or themes” (Siegle, 2023). To break down the data into these groups, I first went back through all the transcripts or summaries and made comments on the documents in areas that stood out to me. These “stand out” items could be multiple things: direct answers to one of the interview questions, current impacts the businesses are facing from the climate, future proofing efforts, thoughts or concerns about climate change, opinions on how their businesses could change, and more. Once I went through all of the transcripts and summaries with this process, I copied all of the lines and placed them into a spreadsheet. Along with the stand out items, I also copied over the comment that I left on those items. These comments were the rudimentary codes that I used to make sense of the data. I sorted

all of the comments in the spreadsheet by count, so I could see what codes were repeated throughout all of the interviews. Once I got an understanding of the common themes, I could focus on these areas in relation to resiliency theory; they became the basis for my recommendations in the conclusion and recommendations section.

To generate recommendations, I considered the major themes that stood out across all the interviews and referred back to Denyer and his resiliency practices from Figure 3 in this article. If there was a theme that indicated a blind spot in the organization's resiliency model with respect to climate change, then a recommendation was made to address that blind spot. If it spanned more than one quadrant on Figure 3, then the recommendations would have to span all the areas where the SMEs were lacking.

4.0 Results & Analysis

After the interviews were conducted, the data was broken down into similar themes to find results throughout the interviews. Once these themes were determined, I could consider how SMEs are currently being resilient, and where they are not.

When discussing the scope of the business in terms of vulnerability to climate change, most of the businesses that were interviewed had at least one area where they were being currently impacted. A visual representation of these codes can be seen below in Table 1.

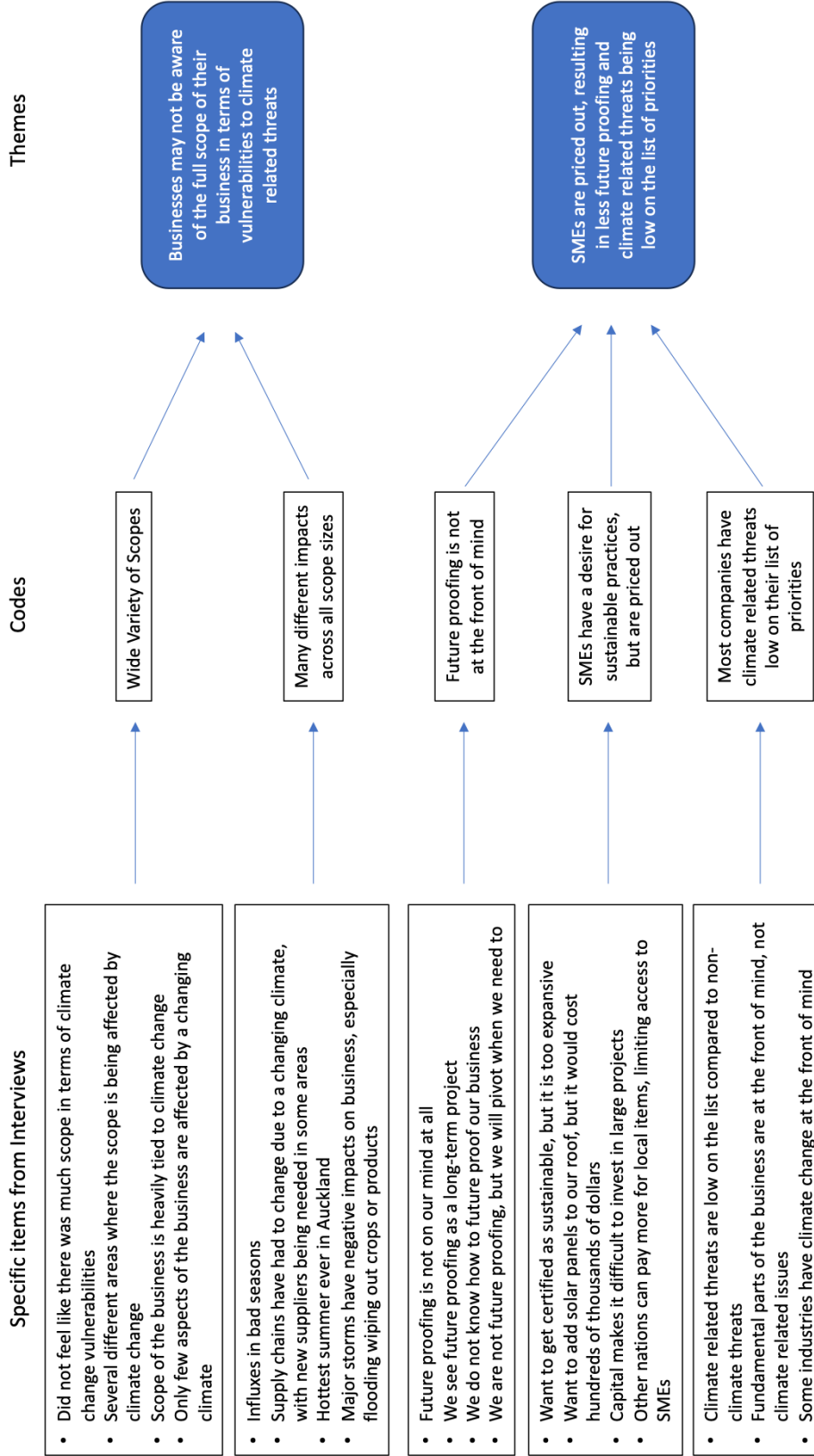


Table 1

The businesses' scopes had a wide range, such as supply chain disruptions, the typed of products that they offer not being the most sustainable, or concerns of air travel pollution. While some businesses did not believe that their businesses had a large scope in terms of threats from climate change, they still gave examples of how a changing climate is impacting their business now or in the future. This shows that not every business is aware of how their business' scope relates to climate change, and that blind spots are present for these businesses.

Most of the businesses interviewed did not feel that the workforce and economy are significantly affected by climate change. The common trend was that if the business did have concerns in this area, it would be either the workforce or the economy. An example would be that one business did not have workforce problems with employees often keeping their jobs for a long time. But they did have to worry about their pricing to make sure they can have a wide range of customers. On the other hand, one business felt that the economy for their business was well off, and climate change would not really change that. Some of their employees live rather far from the facility, and climate change (particularly large storms or floods) would have a major impact on their employee's ability to get to work, or go home at the end of the day. Overall, this area did not concern many of the businesses.

Every business interviewed had at least one example of measurable change that may be due to climate change since they started their business. Examples differed by business area and ranged from limited recycling options, the types of food offerings available to customers, a change in harvesting time of product, an increase in the frequency of flooding, traveling less and doing more work online, suppliers closing

down due to increased climate threats, and noticing a higher rate of severe storms. This suggests that businesses know that the climate is changing, and that it is currently impacting their business.

While most businesses stated that climate change feels like an imminent threat, some of the businesses stated that they feel it is a distant issue. This is an interesting point, as the businesses that stated that they felt it was distant provided examples of how their business is currently affected by climate change, and that they believe they will face greater threats in the future.

Future impacts are something that all the business leaders interviewed are also thinking about. Like the list of current threats, these answers ranged widely based on the type of business the leaders ran. Some examples are that the variety of products that will be offered in the future will have to change, businesses may decline in some regions due to increasing temperatures, there may be difficulty installing products due to changing weather conditions, there may be limited access to once widely available supplies, and there may be a change in supply chain suppliers (or having multiple suppliers as opposed to one), and there will likely be less air travel. Being aware of potential threats is a business resiliency practice, as it allows for them to plan for potential changes.

While being aware of a future threat is important, future proofing for these changes is just as, if not more, important. Although many businesses are aware of potential future threats, not many of them are future proofing for these potential changes. While some business paid no regard to future proofing even though they are aware of potential impacts, some businesses want to, but do not know how to. Of the

companies who are future proofing, it is usually around the types of products that they offer. The answers received were either a wider range of products, or a different product replacing the previously used one. For a wider range of products, an example would be a local flower shop now also offering dried flowers and different types of plants, so that if a major storm wipes out a large supply of flowers, the business still has items to sell. When it comes to replacing products, this occurs when a product is either wiped out from a storm and needs to be replaced, or the business can't afford the product anymore, and needs to find a more cost-effective substitute. This will be a major area of recommendations, as future proofing your business for potential threats is one of the best ways to be resilient to change.

Along with this, many of the businesses interviewed ranked climate related threats low on their list when comparing to non-climate threats. This makes sense for SMEs, as the scope of these businesses is typically small. Because of this, a common answer that I got from interviewees was that they care more about the fundamentals of the business than climate related threats. Some businesses stated that it was high on their list, but typically only when their product was directly affected by climate change. It can certainly be difficult for SMEs to adjust to climate related threats, and my recommendations will address this issue.

The climate threats that concerned the businesses the most also had a wide variety of answers. The most common answer was the increase in severe storms in the region, and the fact that they do not seem to be leveling off or decreasing. These storms can result in damages to facilities and the equipment in them, as well as limiting travel to the business. Another common answer was the increase in flooding, which

threatens supply chains, travel, and access to supplies vital to the businesses. Other threats mentioned were rising sea levels and changes in temperature.

Most of the businesses also gave examples of how they're changing the way they do business because of climate change. These answers were also dependent on the type of business but showed that climate change does have current impacts on these businesses. One example of changes in the climate include include harvesting time, where one business leader shared that they are harvesting grapes up to two weeks earlier than usual in recent years. Another business leader is trying to get certified as a sustainable business, which would highlight all of the work that they have done to become more sustainable in the face of climate change. Finally, due to the changing climate, one business leader is using more sustainable vehicles for transportation of their products to customers and making more than one delivery on a trip.

Industry wide support is an area where the answers were split. Some industries did have support across businesses, and one business leader in the property management and hospitality industry said that it was on every agenda at every conference they have been to. While this is a positive, not every industry is as forward looking. Several respondents noted that there was no industry wide support, and that they were on their own to make decisions. Industry wide support and communication between SMEs could truly increase resiliency, not just for the businesses in question, but for the industry as a whole.

5.0 Recommendations & Conclusions

When examining Denyer's resiliency model, multiple important notes were made regarding how businesses can be resilient. Firstly, the behavioral strategies shown in Figure 3 give us a general outline of where businesses focus can be, with *consistency and flexibility* behaviors on the X axis, and *defensive* and *Progressive* behaviors on the Y axis. By observing this model, we can see where businesses generally fall on the graph, and also see which areas are less occupied. As shown in Figure 4, a strong focus in one area can cause blind spots to appear in other areas. This highlights weaknesses in businesses, or areas that are simply not paid attention to. To be more resilient, it is important to make sure that all areas are covered. The 4 Site model (Figure 5) was also discussed by Denyer, which is a cycle of Foresight, Insight, Oversight, and Hindsight. As businesses become resilient, making sure to go through this process is important for business leaders to catch potential weaknesses in their systems. By showing blind spots in business interviewed and using the 4 Site model, recommendations can be made to businesses to become more resilient in the face of climate related threats.

Looking at Table 1, the data suggests that SMEs are often priced out, that is, they cannot afford to prepare for or respond to climate change. Some examples provided were not being able to afford a sustainability certification due to the high price, and wishing to add solar panels to the business but not being able to due to it potentially costing over \$100,000, and the fact that limited capital makes it hard for SMEs to invest in large projects. Along with this, many of the companies spoken to feel that climate related threats are rather low on their list of concerns related to non-

climate related threats. Similarly, many businesses are not prepared to future proof at their businesses, due primarily to climate change being low on the list of concerns for these businesses. Some businesses only take precautionary measures as threats arise, which is not sufficient if an unexpected or particularly large weather event were to impact the business. As shown in Denyer's behavioral strategies, this action is allowing for a blind spot to appear in the "Mindful Action" quadrant in Figure 3. Although some businesses are aware of climate related threats and wish to future proof, many of the SMEs interviewed do not have the means to future proof their businesses. In order to become more resilient, it is important that SMEs focus on what they can do to future proof, even if it entails making small steps in the right direction to achieve a long-term goal for the business. Some examples may include adopting more sustainable practices, paying attention to potential weather threats to the business, and having a variety of products in case a product gets affected by the changing climate.

Because of these findings, the first recommendation for SMEs in New Zealand is to focus more on climate related impacts while finding better ways to future proof their businesses. Currently, several businesses have identified potential threats to their business that may arise in the future due to climate change. The data suggests that many company leaders are falling into the "Preventative Control" quadrant in Figure 4 (Denyer, 2014, p. 16). This means that they are trying to protect their results while also staying consistent in their current practices. Future proofing would move these businesses into the "Mindful Action" quadrant in Figure 4 (Denyer, 2014, p. 16), allowing for them to continue to protect results, while also being more flexible towards potential threats. Future proofing relates to Mindful Action by allowing businesses to be

more flexible when climate related threats do impact their business. If they have noticed impacts in the past, such as flooding of a facility, the business will be better prepared for a large storm in the future by having the awareness of previous experiences. They could see a storm coming a few days in advance and make necessary changes to their building. They then could move important equipment to an area that did not flood at the last storm, retrofit commonly flooded areas with preventative measures such as sand bags, or close the business for the day if the flooding hinders day to day activities.

By future proofing their businesses, they will be more resilient in the face of climate change by having a better understanding of what threats they may face in the future, while also preventing large amounts of damage to their businesses. Along with being prepared, it would also begin a 4 Site methodology cycle for the businesses, shown in Figure 5 (Denyer, 2014, p. 20). Specifically, thinking about the future impacts for the business would be the foresight step of the model, and installing the future proofing items would be insight, or “interpret[ing] and respond[ing] to the present conditions of the business” (p. 21). In this case, the present conditions are the threat of climate change to the businesses. By implementing these preventative measures, SMEs will be more resilient to change as it happens to the business. As a small number of SMEs were interviewed compared to how many SMEs there are in New Zealand, these relationships could be explored further in future research.

As also shown in Table 1, the data suggests the scopes of these businesses covered a wide range of topics regarding vulnerabilities to climate change. While some businesses stated they were directly impacted by the changing climate, others felt that

they did not have much scope in terms of vulnerabilities. Yet every business interviewed mentioned either current or potential impacts to their business due to climate change. This also shows a blind spot for these businesses, as although they are aware of impacts to their business, they do not feel like they are being impacted as heavily as they truly are. Because of this, the second recommendation is to get SMEs to gain a better understanding of their scope of business in terms of vulnerabilities to climate change.

To be resilient, businesses need to be aware of all potential threats to their businesses. As the data shows, businesses are aware of climate related threats, but feel as if they are not very important to keeping the business going. This suggests that the businesses are currently falling into the “Preventative Control” quadrant in Figure 3, which means that they are monitoring and complying to their current threats. While it is good to complete day to day activities for SMEs, a large storm or other climate related events could cause serious issues for the business if leadership is not prepared. This shift would also fall into the “Mindful Action” quadrant in Figure 4 (Denyer, 2014, p. 16), as they would still be protecting their results, while their ideas and views about climate change would be more flexible than they currently are.

This recommendation is important, as several of the businesses that I spoke with believed that their scope was rather small in terms of climate related threats, yet they all had examples of current and future threats that are or may affect their business. Some of the interviewees even stated, “I have never really thought about that” when questions were first asked, showing that it is not on the top of mind of them. Along with this, several businesses stated that non-climate threats were more

important than climate threats, even though they were facing impacts currently. This would also fit into the “Oversight” step of the 4 Site method (Denyer, 2014, p. 20), as it will allow for the SMEs to monitor and review how their businesses are being impacted. To be resilient, SMEs need to be aware of what areas of their business they need to be resilient in, so thinking deeper about the scope of their businesses is important.

Industry wide support is an area where SMEs could truly make a lasting change when talking about resiliency. Very few of the interviewees mentioned strong industry wide support for preparedness to climate related impacts, but the few who did emphasized the importance of strong connections in these industries. One business manager mentioned that climate change has, “been on every agenda of every conference” that they have been to. Another manager mentioned that they attended a conference in Auckland which discussed sustainability, and how it can be implemented into the food industry. When discussing industry wide support, the businesses who had connections to it felt very strongly about it. That said, several businesses had not heard of any industry wide support for their industry, or had only heard small things few and far between.

Because of these findings, I recommend that businesses in similar industries come together and discuss climate change and resiliency with one another. This would allow for not one, but several different businesses to become more resilient by discussing what does and does not work for them with peers. Specifically, the businesses involved would move into the “Adaptive Innovation” quadrant in Figure 3, emphasizing flexibility in ideas and action, along with being progressive as a group. Along with this aspect, the businesses could go through the entire 4 Site model with

their peers. Including Foresight would be an important first step, as all the businesses could discuss what they are anticipating and predicting in the future. This could vary from business to business and from location to location, but it would provide all businesses a general idea of what is concerning other businesses in their industry. Insight would also be vital, as all businesses could discuss current impacts that they are facing and try to come up with a solution as a whole to the issues at hand.

When discussing Oversight, businesses could share experiences they have had in the past, and what they did to overcome those challenges. The industry wide support meetings could also occur after large events, so ideas and processes that took place could be fresh in the minds of attendees. Even if some businesses were not affected, they could learn from their peers for future events. Finally, Hindsight would allow for all businesses in attendance to come up with plans based on previous experiences.

To be resilient, businesses need to be aware of potential threats to their businesses. By having large scale conversations with several businesses in their industry, all of these businesses can come together to ensure resilience for not only their business, but the industry as a whole.

Overall, SMEs are facing, and will continue to face, many impacts due to a changing climate. These impacts are forcing businesses to pivot in the ways that they do business. These changes are broad in scope such as managing new supply chains, dealing with new ways of transporting goods and services, managing issues in transportation and infrastructure and their associated costs, among others. I hope that these recommendations provide SME leaders with concepts and tools for helping their

business make meaningful changes and become more resilient in an effort to preserve their way of business for years to come.

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Appendix A - Interview Questions

1. What is the scope of your business in terms of vulnerability to environmental threats? Examples could be office space or offsite production, remote or in-person workers, transportation to your business, or global or local supply chains as some examples.
2. We have had to overcome serious challenges to the workforce and economy in recent years. Does the threat of climate change play into that for you as well?
3. What measurable changes have you observed since starting out in your line of work that might be a consequence of climate change?
4. Does climate change feel imminent or distant?
5. How do you think climate change might potentially or theoretically affect your business moving forward, if at all.
6. How would you rank climate change impacts among other non-climate threats to your business' future planning?
7. Which climate impacts concern you the most, if any?
8. Do you think about "future proofing" your business for climate change? If yes, how?
9. Do you have any specific examples of changes to how you do business as a consequence of climate change? If yes, have this changes cost you money or time?
10. Have you seen any support for industry wide strategic planning or retrofitting to adapt to climate change?

Appendix B - Interview 1 Summary

The first company that I had the chance to interview was a local winery in New Zealand. In response to the first question, the owner said that he did not feel that there was much scope at all in terms of climate change for his business. He said that the winery is miles away from any coast, and they have not had any issues with flooding or sea level rise. They also do not deal with much in terms of supply chain, remote workers, or transportation to their location. The only component of the business that is somewhat affected by climate change is on site production of grapes. As grapes for wine need a rather consistent and controlled environment, the changing temperatures in the air have led to some changes in their production. It should be noted that the owner stated that he did not believe all of this to be due to climate change, as there tend to be bad seasons and good seasons regularly in the wine business. He did say that recently there has been an influx in bad seasons, however. Mainly, he said his business has been more affected by the Covid-19 pandemic than climate change.

As mentioned, the owner of the winery did state that Covid was an issue for the winery. Although that was his main response to question 2, he did say that there were a few climate threats that play into his work. Mainly, there have been more bad seasons as of late. He also mentioned that the seasons have been more wet overall, which could be due to a changing climate.

As for measurable changes that he has observed since starting at his position, he mentioned the ripening of his grapes for wine production. The ripening season has appeared to shift, as he stated that grapes can be ripe almost two weeks earlier than in the past. He has also noticed that winters in general have become overall more mild,

which could also represent a changing climate. It should be noted that the seasons for wine tend to be different every year, and that there are always good and bad seasons. That being said, these phenomenon have occurred more recently.

In terms of how pressing climate change is on his business, he feels that it is a more distant issue. He stated that, “right now, we are more concerned about using their current resources than capturing CO2 or anything like that.” He also feels that New Zealand as a whole is not working fast enough to make a big difference towards the climate anyway.

When discussing how climate change might potentially or theoretically affect his business in the future, the owner stated that the variety of grape grown at the winery would be the main change. As certain grapes depend on certain climates for proper growth, the increasing temperatures in the area may make it impossible to grow certain wines in the future. Specifically, he mentioned that Pino Grigio may be much more difficult to cultivate in his area if the climate continues to get warmer.

The owner stated that climate change impacts are rather low on his list for future planning, compared to other non-climate related issues. In a similar vain, he stated that there were no specific climate impacts that concern him in terms of his business.

When asked about future proofing his business for climate change, the owner stated that this was not on his mind at all. As he is older, he is currently more worried about retirement than future proofing. He feels that climate change is more of an issue that his children and their children will have to work out, and he is not completely bought into the fact that this is a severe issue that needs to be tackled. As the wine

business has good and bad seasons regularly, he sees this change in weather as just another bad season.

The owner also mentioned that he did not have any specific examples to give about how his business has changed due to the climate, but he did tell me about how farmers have to deal with changing weather. Mainly, he talked about the timing for grape harvesting and when they can harvest. He also mentioned that grapes are sensitive, and changes in the weather can have large changes on the grapes. Specifically, he stated that farmers are, “victims of weather and how the weather plays out.” He said he personally can’t do anything about the weather, and that him and his winery have to deal with the consequences themselves.

The owner did say that he is aware of support for industry wide strategic planning in terms of climate change, and that there are certainly discussions about it. That being said, he stated that an island of 5 million people is not going to have that large of an impact on the climate anyway, as the island simply is not big enough. Specifically, he stated that the oil consumption in New Zealand is comparatively low to many other nations in the world, and that he is a fan of nuclear energy and solar energy. Although, he wishes that things were moving along faster than they currently are in these areas.

Appendix C - Interview 2 Transcript

Interviewer 1: and thank you for taking the time to be part of this conversation. You know. I wrote Adam thinking that you know that I really don't understand the organizational structure of your business.

Respondent: Fair enough, we barely understand it, So.

Interviewer 1: But I know what happens in Wellington is just part of the business. So I know you have other properties in other parts of New Zealand, and maybe Australia, too? Is that right?

Respondent: No, just New Zealand, ya. I'm trying to keep [name] you know, contained to New Zealand, that my goal haha. Yep, no, just New Zealand at this stage and uh, but, we have certainly moved into a few other realms I guess, since you probably last caught up with Adam. So, he may be based in Auckland now that we have our two properties in Auckland. And we have kind of divided the duties, so I am based here in Wellington, and then we also look after a few other, uh, sectors now. So, we have the assure accommodation group membership base, which is motel based organization with several properties around New Zealand. So we look after all of the membership for those properties. So there's a few other things we're doing as well, but we try and juggle a range of things, and then we have, of course, the likes of Lisa, and each who, I think you work with closely on on the booking side and the sales side based here, that Wellington team that that centralizes...

Interviewer 1: You would characterize your business as a property management, business and hospitality, I mean, I don't know how you would categorize it.

Respondent: Yeah, we're very much hospitality in general. So we delve into a lot of the different areas of that. But basically all customer focused. So that's sort of our main point of what we're doing and why we're here, but how we can motivate to help, and then deliver the the services and and support to the entities that we have under us. But we certainly have, you know, with the various roles that we all do. We're either, you know, sort of in the business managing, or we're alongside supporting, and and I guess strategizing and part of what we offer in the background of HR, IT, finance, sales, marketing, and find new services. So that's the kind of motive model. For for instance.

Interviewer 1: yeah, and yeah, I mean, your customer service is great. Lisa has been great, everybody that I've worked with here over the years. You know. It's been 10 years now, almost 11 years, actually, has been great. So you know, if there's a problem, we we get it sorted out and, so, its been great.

Interviewer 2: I haven't been here 11 years but is has been great for me as well, so.

Interviewer 1: I mean, these buildings aren't getting any younger, I'm sure there's kind of maintenance that just happens, you know. Well, let me let me tell you a little bit about this study. I'll give you an overview. And this is kind of just a generic sort of

statement that I've said. And we're actually doing this study, not only here in in New Zealand, but we're also doing it in Massachusetts, where we're talking to the leadership of small and medium enterprises. And we're talking about resilience. And by that I mean how they're responding, thinking about framing, potentially strategizing around the question of climate change. And you know whether you think it's man made or you don't think that that it doesn't matter. I mean it then, and that would be interesting to know what you think. And I know that's politically charged as well. So, but I think mostly what we're interested in is, if you think that the climate is changing, if you, if you believe that to be true, and if that sort of awareness has sifted into, it's sort of made its way into how you talk about the future of property management, hospitality for your business and trying to get some insight. But this is a very preliminary kind of study. So we're really trying to just understand, from a range of different businesses from, you know, in Massachusetts we have a cannabis industry, and we interviewed a woman who has a particular product line that requires them to use very sophisticated instrumentation and extraction tools. And when we had some very serious flooding, you know. She was afraid her propane tank was going to rise up and float away. She didn't know what to do, because she hadn't really thought about that. So we're really just trying to get a sense of, and in this this past summer we had terrific wildfires up in Canada, and the air quality index. I know you had that with fires in Australia which the smoke made its way all the way here a few years ago. But this summer, you know, it was very hazy days on in June. And smokey I mean you could smell it coming down from Canada. So just wondering. First question would be, You know what is? I'll just read it to you. What is the scope of your business in terms of vulnerability to

environmental threats. And I mean by that, you know, in terms of you know, office space retrofitting, for example, offset production locations in person. Workforce transportation supply chain is often a huge one, particularly for manufacturing firms. So, and and it could be. And I'm certainly open to this. You don't. I mean, I want to put words here about it could be that you're not really thinking about climate change and that you're, it's not, it's not something that you say. Yes, we're gonna talk about how we're gonna respond to climate change. And and that's fine, too. How whatever comes to mind for you.

Respondent: Yeah. Great great opening great opening feel to to really get into the swing of things. And I think you know, for us, previously, when we were worrying about Auckland and Wellington businesses, you know, big cities versus regions, it's quite different in New Zealand. But now with us, looking after the motel sector and, and really thinking about more regional New Zealand certainly what we saw in the beginning of the year, when we had, you know, Auckland had probably the worst summer has ever had on history, and all of up north and in the east coast got slammed with these back-to-back cyclones. So I think in New Zealand that's forefront of mind and climate change like it's something that is talked about frequently in businesses. But also, I think you know, it's funny comparing to Australia, where you know, sometimes I feel like, you know, they've got that more in their face with, like you say, the fires and all sorts of things going on. I sometimes think so that New Zealand is a little bit more forward thinking with, with what we're doing in that sort of space. Certainly from our industry perspective. When I travel to Australia for conferences. I've been quite surprised that, some of the hotels are still doing individual, tiny little bottles

of shampoo, and you know things that I think, is a really normal practice, now to have in both spaces and things for the kind of like, you know, ran through and has been talked about for years that we've moved on quite, quite substantially in certain areas that it's discussed more and and certainly have a bit more behind it. But yes, certainly that the beginning part of the year was really a big part of what we did as a business to well, how can we help support, particularly the motels that we're getting cut off, and there was certain ones on the east coast that didn't have any routing. And like you saying about transport, you know, and transport issues and all of those kind of things. And I think in regional New Zealand there is definitely supply pressures. And we're focused as an industry on what is this next government looking like? Because we haven't had, you know, really a tourism minister that's been one steady. But to focus on tourism and what it means over the Covid period to move quite a bit in the association space where we're working with you know, we have this kind of 3 main associations in the tourism hospitality space that have different angles, that they're working on our behalf on, but really trying to have a focus approach of, well, how can we future proof New Zealand from getting in international visitation and been able to one, move around, but make sure that we can still supply that right service, and in quality of product, and and what that will look like. This is the domestic market of okay? Well, you know, how do we keep them in in New Zealand? If it's becoming really expensive to live here and and expensive to travel, you know. Cost of of flights that's been through the roof this, this past sort of 6 months. So what does that look like as well. So I think there's some really big topics around, the sustainability of the industry, and how that being creeps into, I guess impacts of if it's climate change things, you

know. Certainly last summer we had massive disruption of our ferry services in the North Island, South Island. That wasn't to do with climate that was to do with them having probably bad luck and poor management of maintenance of fleets. Which was compounded by the fact that we had back to back cyclones, and that impacted all of the the north part of the country. So everyone kind of been flocked to the South island, but they couldn't get down there because the ferries were broken down, and it was a whole lot of sort of compounding impacts on tourism in general in New Zealand, and where they sort of came from. So I think it's, when I think about, I don't really think about climate changes as it's own topic, I think about sustainability of the business as its own topic. So climate change is one aspect of what that looks like and being a sustainable business has so many other aspects of having the workforce be able to come into New Zealand and look after the domestic workforce. But also, what can we do with the business to make sure that if we are impacted by a massive weather event, or an earthquake, or whatever the event actually is. How do we then, you know, help support the businesses on the regions? Or how do we ensure that they can still operate and have all of those kind of things around us. So, yeah, that's, that's kind of my take on climate change. But I look at it as a whole. Sustainable of is the business sustainable, you know. And can it get through a major event, or something that might go on. That will impact us like the pandemic.

Interviewer 1: So can you say more about how you actually did respond to some of those motels that were cut off. And so I'm thinking, in terms of like what you actually did, and whether you had to sort of think outside of the box, and come up with some

approaches that maybe we're not standard operating procedures. You had to invent something new, maybe.

Respondent: Yeah, they ended up playing around. The communications was still up and running, which was, which was great cause, I've you know, I've certainly been involved during some of the like with, Christchurch, the communications were down all together, so that's always a scary place to be because you really don't know how to then manage a crisis or situation if you can't get in touch with anyone. So it was really just making sure that we had a clear approach on how for the motel to stick to how we would be in supporting them. So one on one communication. On what, what can we do? Is there anything you need us to do from contacting supplies that we know or see anything equipment that they need, and and just ensuring that we have the information for that region up to date, that they were across what we like could get help if they needed help and things like that. So it was more around and the support behind the scenes, and and what we could do. Probably in reality there wasn't a lot that we could do other than that they were coping within that particular, you know, region of okay, they still operation, fine. But then these are like a business, because people can't, you know, travel around this month? So you know that is really hard to then you can't necessarily do anything in that moment. But then, how do you put the wrap around? Support of? Okay, well, let's try and do a bit of a, maybe you know bit of a campaign moving forward that it's open and ready for business and trying to tap into what the regional tourism body is doing as well. Once it's recovered from that moment in time. So yeah, that's probably how we, how we looked at it in the beginning part of the year,

and certainly since then, you know, we had some flooding down south a couple of months ago. She was quite a weird week, but there was a earthquake down, in Geraldine, which is a bit of a strange part to have an earthquake anyway. And then there was a flood down that way. And then there was all these wild fires and Canterbury all in in the space of one week. And so again it was like right we just need, and just touching back with each of those properties in those regions. So are you okay? Like is is, you know, are you still operating? What's going on?

Interviewer 1: That's like, everything! Every possible calamity at once, in one week! So does, I guess one of the ways in which I imagine it might affect you if we talk about climate change or the consequences of climate change might be, you know, where you locate your properties, where you buy things, where you invest, where you, ya know. Does this come into play when you think about, "eh, I don't know too close to the coastline" or you know, "not enough above sea level," "high risk of getting cut off." I remember the earthquake that hit around Kaikoura not that many years ago, and they were completely cut off, and I remember seeing the road just buckled, just unbelievable. So I just wondering whether climate change plays any role in where you decide to do business and, or is it so widespread that you wouldn't quite know where where to start.

Respondent: Yeah, I think it's good. I mean, given that majority of the actual physical properties that we're operating are based in Wellington, probably a really good question for the owners, right, of those buildings and investment. But that's where, you know, there's a lot of work that's been done on the earthquake strengthening and

building, you know, buildings to a certain spec. I mean all of our, if I talk from a village standpoint all of the work that Lisa does in the corporate space of managing RFP's and working with that corporate travel management company. There is not one that comes through her desk that she doesn't have to talk about earthquake strength building standards. There's 2 things that she has to do these days, one is around the building standards and the other is around sustainability and business practices in that regard. So we can't, you know, go through a process and win an account without talking to all of those angles around what we're doing for those 2 elements. So I think that's where it shows this full front of mind for the corporate management companies, managing these accounts. Government agencies staying with us, corporate accounts is staying with us. They want to know that they're in a safe building, and that we have a plan. And we also are worrying about all the other things that go with climate, and environmental. And so there's a lot of process behind it, that goes into it. So we know, I mean we're passionate about it, anyway, because we know that it has an immediate impact on our business. As soon as we started implementing all of the things we were doing a couple of years ago. Now we became part of a pilot group in Wellington with Wellington, and we worked through a sustainability group and a focused 3 months session where we had, you know, carbon emission companies come and talk to us, waste management companies, energy companies. We had all of this amazing research and impact. And we worked through each of the different elements around, where can we actually make a difference? We could actually see, you know, one, the cost savings behind some of the implementation of products that we're putting into the properties. But two, we knew that it was having a bigger impact longer term. And so we still got a way to go on

that like decision things that you'll notice in the properties where you are, where we need to work on the heating side of things and the cooling side of things that are still not quite right.

Interviewer 1: The Harvard Business school, I haven't used it but they have a simulation now around some sort of hotel that needs to become more sustainable. And how do you do that? And and maintain quality, and reduce costs. So I do remember Adam one time saying to me, cause I said, Well, you know I wanted to know about earthquake rating of [hotel]. And he said, Well, you know. Well, so I said, if there's earthquake? He said, look, the earthquake rating tells you that the probability of you to get out of the building is high. It doesn't mean you'll be able to go back in and actually live in it, you know. You know. So, which was actually very useful to know that it's, we're really talking about survivability, to some extent. And that that allows you to, you know, to exit the building safely. Because I remember I went down to Christchurch with my wife right after the 2011 earthquake, and I could see all those buildings that were being torn down, you know.

Respondent: One of my friends lives down there, and his house got hit, and he couldn't live in it, it wasn't safe.. He's only just got it rebuilt now. So we, you know, it's so many years down the line because of the complications around that. Oh, my gosh! It's been a long road to rebuild but yeah, I guess the positive side of it is, they've rebuilt it, a city that that was pretty much flattened, to a brand new city. So they have been able to really think about how to design a city. And make it a sustainable one for the future.

Interviewer 1: They had a competition right? Didn't they have a competition that you could? Since you could, you could submit ideas, for I remember someone saying, Hey, you have to look at this ,where you could submit ideas for how you wanted the new Christchurch to look. You know they, they did something like that. I don't know whether they took any of the ideas, but they have some kind of thing like that. So you know, when I just I mean, maybe we've already asked this, but and I'm gonna shut up and then let Interviewer 2 ask some questions, too. But would you say, how? How would you rank climate change impact among other non-climate threats to your business. Would you say that you have other things that you worry more about like earthquakes or tsunamis, or things like that? Or climate change? And is climate change one of those one of those factors in your planning and thinking about the future that plays an important role in what you pay attention to.

Respondent: Ya, I think its a factor in there, but there are so many other things, especially tourism in New Zealand. We have had so much pressure, this time last year I would have been absolutely talking about not having enough team members, not been able to employ enough people because we just were in a situation where there weren't people coming into the country and we didn't have enough workforce in New Zealand to want to do some of the jobs that people don't want to do. I think thankfully, we're in a slightly different place with that, but I think our biggest challenge has been around attracting the right time, and it's the same here with, you know, pretty much the positions that had been difficult to fill in were housekeeping, night team, and the

kitchen team. So shifts. And you know it took us, I think it was about a 7 night month process to get a Chef down at one of our hotel properties. But like really, really hard to do that. So then what does that look like from a service standpoint, and and the quality of delivery. And you know, thankfully, we're not having to cap rooms anymore, you know, where we couldn't service the rooms. So we had to turn off availability because we couldn't, actually, you know, I mean, we were all doing housekeeping there for a few months, and it's just what we did. But look at, you know, we're in a different place today. But I think there's always that, tourism has a unfortunately has. You know, we've got a longest term issue here in in New Zealand, where it's not seen as a career, like a long term career for someone. If they can't see that the path through, and if they don't, if they think it's just, you know, housekeeping will just a way to, or something along those lines, I think, is some bigger issues around tackling it as a viable job, and that you can actually progress through and move into lots of different areas. So there's a lot of work being done in that sort of space around making it more attractive for more permanent local people. But also, then the issues that we have with immigration of bringing people in, you know, want to come and work in this country and the steps and the hopes for that, you know. It's taken them. One of our Chefs in Auckland is taken 63 days to get his visa across the line, and he's been, you know, out of work, waiting to be able to continue working with us like it's been. It's so stressful for them. And and there's so many hopes that we have on that side. So I think you know, really, what what we really want as an industry is is a lot more work that's, I guess the associations can do for pressure into the government to make some of these retype things, you know. Ease of pressure, so that we can kind of, you know, keep things moving in the right

sort of direction and moving forward. So yes, I would love to say climate change is up there. But we've got some other sort of major things that I think fundamentals that have that knock on impact. That are also a full front of mind. Within the area. And again it comes back to sustainability of the actual full business model of, you know, if you can't get enough people or that's not the right people, or they don't, you know, want to stay with you for very long you've got that turn over, and then, of course, you don't have the heavy use, because we can't deliver the right service. So it all goes in a big cycle. So it's yeah, pro. Probably that would be full front of mindful for us

Interviewer 1: Interviewer 2, let me pass through the baton. I do have one more question, but after but after you've asked one.

Interviewer 2: Sure, I guess a good one to ask about would be, Do you have any specific examples of changes in how you do business as a consequence of climate change? And would that be something that has cost you money or time for the business making these changes?

Respondent: consequence of climate change. Erm, yeah, I think I think where I'm probably struggling at the moment. I really want to get us certified, like, I really want to show that things that we've been implementing and the work that we've been doing over the last 2 and a half years since we kind of embarked on the structured program, I would really love to have us properly recognized and certified. And and it's, too, you know, we're actively trying to reduce that carbon emissions. We're actually trying to put all these things in place and there is so much to that right, So much on the waste

management and energy space, and then all of the other small elements. You know, just looking at how we manage the food waste and what the guests are doing in the rooms and getting them actively recycling. And, and I guess all of the educational stuff that goes with that. There's a lot to that. But and I guess certification of what that looks like. So probably where I'm struggling. And I'm thinking I just had this conversation with Wellington indeed, last week is that you know that the carbon emission and bodies that exist here are are awesome, but they're very expensive to get that kind of, you know, proper certification part in place. And there are other, you know, this cool map program. And there's a few other programs that kind of, you know, do all the sustainability and environmental sort of cheat lists for you, but they don't necessarily give you a certification. So if you want to go down the road of really showing what you're doing, and I think that will be really helpful for the likes of anyone that's wanting to know. Well, he say you do all these things, but doesn't mean anything. Yes, it does. We've got this whole background of certification, it's just crazy expensive. And so I feel like the challenge for us is that, well, how do we, how do we show what we're doing in an area that's really important. Without it, then it's almost like it's created a whole other industry of, I don't know, people in positions and companies that are existing, of, of money. And so I think that's where I'm struggling right now, and we're absolutely not the only local small and medium business struggling with this. This will be other companies as well like, you know, we try to do all these things, and we really want to show what we're doing. But if there's a really big price tag associated to it. What is the value in return on investment for us in that space?

Interviewer 1: Can I just ask, can I ask what the what the major costs are of that certification? Is it getting consultants into, I mean, do you have to pay fees? I mean, what are, what are the costs associated with being certified as a sustainable place?

Respondent: And I think this is where, there are two major companies we have been looking at that are good at doing all of the stuff in that area. One is probably the bells and whistles of that space, and they are sending consultants, you know they are working with you to do it, because its not just once and that's it. You're obviously on a continual journey with it and you need to have what those plans are moving forward. So there are a lot more hands on and getting into the business and reviewing all your documentation that goes with it and all that kind of stuff. Yet the other company, which you know I still think it's cheaper, but it's still expensive to the industry. It's literally just I feel, sounds terrible, but it feels like it's just checking the box on, look, we've got all of our and emissions here, all of our documentation, and they've gotta have someone in the background cross checking that to see if it's true? And then we get, you know, a certificate for that. So yeah, I'm struggling with it because I just feel like it's a high price for the stuff that. We actually have to do all the work on bringing it all together. All the data, all of the stuff behind it.

Interviewer 1: So you do all the work. And they give you the certification.

Respondent: Yeah. Yeah. And I really wanna do it for all the businesses. Because what what we first did with this program was that we did it for [hotel] suites and [hotel]. And then we just used the sustainable procurement policy that we have in place and the

SOP behind it is being something we use across all the businesses. So then we go and review the contract with our appliance repair people, for example. They get the signs of documentation around. This is what's important to us is what we want to, you know, look at from an environmental perspective. And if we invite you to respond accordingly, and you know we've made a decision based on the fact that they don't just, if something is end of life. So you know, you've got your your leaky dishwasher that we've got to replace and they determine the complex sort of bring it out. They don't just take it off to be scrapped. They've actually been recycled the elements of that. But before we didn't have a policy on that, so we didn't ask any of these questions. So now we're asking all these questions of our suppliers and our contractors. And then we make decisions on who we work with, based on the whole cycle of the product, for example, and which is a great, you know, kind of great great story, but as just one thing of many. But I kind of feel like it's not just our industry. I look at my husband's and them in the finance, investment and finance. And he said, Oh, my gosh! All these new positions that are cropping up of, you know, sustainable managers, and all these people that are kind of, you know, existing the lawyers side and the accounting side. It's like, Wow! The whole industry that sprung up, that, you know. Is it really adding, adding the value that you need? Or is it actually just kind of making some money on the side, and and I think that where, you know for us, we want to be able to do it across all the businesses. But if it's costing you an arm and a leg every time you try and certify yourself, then it's not probably the right approach. So I don't have the answer to that yet its' something I'm working on.

Interviewer 1 so many things to to focus on. So I did want to just ask you a question about the industry groups that you hang out with, and when you go to conferences, or you get together with your colleagues, and you know tourism groups and hospitality groups. So, what do they talk about with respect to climate? Or maybe they don't talk about it, or is, is that on their agenda?

Respondent: It has been on every agenda of every conference. Like, we can't go to a conference in New Zealand without it being on the agenda. Actually, I went to a revenue management conference in Australia, and there was a whole environmental sustainability section, and how does it relate to revenue management? And I was like, how does it relate to revenue management? It was really trying to say, you know, relate the fact that making business decisions based on hotels or properties that have certain things that they've done in mind. But they're also, like they're not just greenwashing. They're not just saying, this is what they're doing, they're actually really believing in it and really implementing it. In a mindful session. So it takes quite a long time, because, you know, even now, with pitch, saying, You know we always asking the question of of our team. Well, you want to put these new toilet rolls in. And well, let's talk about the product we does it come from. Like there's all the other things that you have to think about the way. So thinking that, its not just person. You want all of your team thinking about that. So, and its always ongoing, too, it's like anything else, right. But yeah, it's literally every conference that you go to.

Interviewer 1: Did you have another question, Interviewer 2?

Interviewer 2: I might have one more for you. So, more about the future planning side of things. I know that you said that you do realize that there are current things happening in the climate that may be affecting you. But do you think that anything in the future might potentially or theoretically change on how climate change could affect your business, moving forward.

Respondent: Of particular impacts, of events, or just in general?

Interviewer 2: Ya, just a general overview on how, just different types of weather, or maybe sea level rise could sink a motel, or if it's too hot outside from warmer temperatures, it could be harder on the in person, staff, or things like that.

Respondent: Yeah, totally. And I think you know, even Gosh, Wellington, the last few days is like. It's not. Auckland had the worst weather, and we've had this amazing weather. It's like, well, you know, what does that mean as well on? Okay. Auckland's gonna be probably the nicer place to to be for some of them. Auckland's gonna get too hot, you know, like, absolutely, I think it's it's always full front of mind. And I think you know, you see those fearing temperatures in Australia more than you do here in New Zealand and you know. Why? Why would anyone go to Queensland in the middle of the summer when it's just 40 degrees south. I mean, you know, like you really got to think about from a travel perspective, what what makes sense? And then having the right equipment to to deal with that. So if it's yeah, and it's like, knock on and pay

right? So if it's getting hot, I mean, people need more cooling systems. I mean, it's the knock on impact of energy, and so on and so forth. That goes with it. But we're really focusing now on ensuring that we've got the right and equipment being put into the the older buildings. So we've focused on [hotel], town houses in [hotel]. We're looking at all of that at the moment, putting some heat pumps in and more sustainable energy options into the town houses. So we've just literally started this week on that project. But of course it's the capital that needs to go into that and it's not a sort of quick, easy fix and the logistics of doing it. So it's it's kind of, you know, looking at it on a longer term project around the buildings, and how we can minimize because it has, like temperatures, have been rising, and it is hotter and summer, and it is colder and winter. And then you know the address. Other conditions around. Like you sign rising, you know, sea levels and all sorts of things that we don't have our physical properties and those supporting motels and such. Yeah, what does that mean for them and what they're doing and like talking to some of our West Coast properties in the South Islands. The fact that you know the major laundry supply decided to pull out of going to the West Coast this year, I mean, I tried to pull every string in the book on the contacts that I had in Auckland and Wellington and trying to get them into that market down there. And they literally just think, you know what, it's not sustainable for us anymore. We're not going into that region. So the properties have had to come up with their own solution around equipment, building it on site, supplying not just for them but other properties in the region. And boy, they've had to band together as a group. So I think it's around the communities and how they work together is so important. They're not doing it in isolation, because. you know, talking to one of the initial members in a

different part of the West Coast last week, you know, we were talking about doing, you know, offering fresh milk and how to how to, just a basic thing that you think is quite normal, and she said, but I can't even get fresh milk at the supermarket down the road like it's it's usually out like we can't guarantee 5 milks. So you've got to really think different strategies for different parts of New Zealand depending on the the supply pressures. But I think it's what those communities need to do together as a group, and they can often come up with their own solutions together, which is great. But how? How do you know the supplies that they provide some of those they can also help with it. So I'm working at the moment with one of our suppliers, that we work with with village on what we do. And the the milk space is something I've been very passionate about, and I haven't had a solution until nearly now, because it's just about to happen. But we've been working on, you know. We've got one of the last things that really bother me. And all about properties are a little and single use, long life milk and and our smaller hotel products. We can. We can offer fresh milk, and we can do milk to taste and all that kind of stuff, and in our bigger properties and and apartments, some properties we can't do that, but we haven't moved to tetra pack , because we can't recycle tetra pack. But I put pressure on a supplier that that supplies it. And because it was just announced that tetra pack will being to recycle in Wellington, so there is an opportunity there. You know, I didn't want our team to have to handle something like this all by themselves, like, I thought if I put the pressure on the supplier to actually offer the service. So, its taken me about a year to get to this point, so we are about to embark on that, we just need to operationalize it. But again, it's you know, we're in a big city. And yet, you know, we've got a a problem that is not just us it's other

properties as well that we can't offer a sustainable option in the space until but it's all points along the way, really. So it's trying to be work together on how to make that change.

Interviewer 1: Hey, Hazel, are you talking about the little, the little milk that are in the refrigerator. You're talking about those yeah plastic. And yeah, yeah, right?

Respondent: Yes, exactly. So what we want to do is the tetra pack as a the sort of, you know that the cartons that are plastic, and unfortunately, in Wellington they have up until now there's been no option to recycle them. So Wellington has very specific recycling, and most of them aren't, you know, it just makes it more challenging to recycle.

Interviewer 1: So I think there was one final question to this last question. So it makes me think about the next generation. And if you're seeing any changes to the people that come into your your company, your industry around what they wanna see happen and where they get impatient, or where they'd like to move things. Do you have a sense of that?

Respondent: I think I mean, I definitely have a sense of it, cause I do a lot of the interviews with our team, and I like to be involved heavily in the village organization, but to get to know, particularly our customer service team, because we are very much looking for a very specific set of skills like being able to interact with people appropriately. But in a lot of those kind of interview processes they're asking us around

these questions. They want to know what we're doing. I find it really interesting. It's an expected thing to to be doing all of these kind of things. And that's where, I think, you know, sometimes when kiwis are traveling, and they get surprised of like, my mom just went to France this year, and she just couldn't believe how they went for cycling. She just couldn't get her head around the fact that in a normal environment they couldn't recycle. It was really funny, because I think we just saw as a practice, and that's what you do. You get your cycling out on a Monday night and get it separated, and we just know automatically do it. And so we expect that based on elsewhere. So I think the generations are being brought up like this, but it's very much coming out. And then the business practices of they're expecting the company to have a lot of background behind it as well, so I think it is a very positive thing for New Zealand.

Interviewer 1: And I think what you're saying is, these small little victories which take an enormous amount of work. And they're small but I mean, eventually they add up. But it's a lot to do and changing other people's system and other people's behavior. It's very hard.

Respondent: Operations side of the background of it, too. And so we're we still working through this process, but in the the bigger units, the town houses and things we've got. We've got more recycling stations there that we are implementing. But we, rather than trying to do it in the guest rooms, because if you staying for months, you are like, you know, you don't want to have a big pile up of recycling going on, either. You want. What about to get it out. So for the most part, what we when I, when I'm helping out the housekeeping team and say, we've just had one of the bigger events.

Sometimes we'll come in after a big weekend, and honestly it's wonderful. I come in, and they put they put all the bottles out. The bottles are here, the shopping bags are here, you know the the papers and the things are here, and they've literally got it all ready for us to recycle and ready to go because they want to do it. And it's normal to be able to separate it out. You know, after we did this this kind of initial pilot program of the sustainability angle, the Wellington team that asked me to speak at a conference for the next group, and as I was saying to them a couple of years ago, I said, look, I think it's really easy to get overwhelmed with that, and to be like I don't know where to start. It's too big. I can't make a difference. And I think my main message for that audience was like it just get started. And it's just one thing at a time like just work on one thing. So yes, you can have a big plan and a big picture of stuff. But just try and break it down into things that you know you can influence and and make a you know total on it. And I did the carbon measurements for 2021, and then 2022. And we'll do this year soon, and already we've reduced down our waste because we've got more recycling in place. We've got more things, you know, implemented. And it was really exciting to see that massive drop of landfill waste. And then it is exciting to show the team, you know.

Interviewer 1: Absolutely. Yeah. Feedback. There's nothing like feedback to feel like making progress so well. Listen, thank you.

Appendix D - Interview 3 Summary

The third interview I conducted was with a local seafood restaurant in New Zealand. When I asked the owner about the scope of the business in terms of vulnerability to environmental threats, they had a lot to say about the matter. The first example that they gave me was about potato chips, a common side at the restaurant. I was told that then restaurant sourced their chips from different places in New Zealand, as well as overseas. The flooding up north in New Zealand caused issues for the restaurant, as they destroyed potato crops. This meant that they had to find a new supplier for some of their chips, which increased their costs. Another area that was effected by flooding in the northern region of New Zealand was their access to vegetables, specifically tomatoes and lettuce. The owner told me that it has now become a matter of “who you know”, and having to network in order to find what they need. The last vulnerability that had the business concerned is the location of their restaurant. The restaurant has an ocean front view, and is around 100 meters or less from the ocean itself. This concerns the owner, as sea levels rising could have large ramifications for the business. They fear that bylaws or other changes from the government will force them to get pushed away, and be forced to move. If this change does occur, then the building will most likely be deemed uninhabitable. That would result in the owner not being able to sell the building, and all of the investments put in over the year would be lost. Another factor is that this restaurant has been in business for over 80 years, so the locals would be losing a piece of their local culture.

When discussing the recent challenges in the workforce and economy due to the Covid-19 pandemic, the owner stated that climate change was not really an issue

for them in this area. Finding a workforce has not been an issue for the restaurant in recent years. This is because the restaurant is in a small town, and they have a lot of people interested in working for them. The owner also stated that they were the biggest business in their village, and that their employees tend to hold on to their jobs for a long time. Regarding the economy, the owner told me that they try to be as strategic as possible with their finances. They do not want to be “bitten by the prices,” and try to keep their prices as affordable as possible to make the restaurant more available to all people. It was noted to me that there is not a large difference in class in New Zealand, and they pride themselves in having all kinds of people frequent their restaurant.

A measurable change that has been observed by the owner that may be a consequence of climate change is the type of fish the restaurant can receive. “Fish are more difficult to get now because of the warming sea temperatures. Some of these fish migrate, and have started coming back less over the years,” stated the owner. Other nations are also willing to pay more for fish, and some of the local fish are simply being exported to other areas due to higher margins. A specific example is the Tarakihi, which is seldom found now in New Zealand. Now, customers will have to deal with a worse quality fish, or a fish less loved by the locals.

The owner told me that climate change feels like a more distant issue at the moment, but there is definitely a little bit of worry in the organization about its potential threats.

The ways the business could be affected in the future by climate change mainly revolve around the selection of fish that will be available to them in the future, as well

as the location of the restaurant itself. These are also the most concerning climate impacts for the business currently.

Climate impacts rate about the same as other non-climate threats to the business, and the owner stated that the local government is mainly in control of this. As previously mentioned, the local government is the only group who can decide if the business can remain at its current location or not. Other than sea level rise, the other climate impact that worries the restaurant is earthquakes. Records have shown that the current region that the restaurant is located was lifted up by an earthquake in the past. It is possible that an earthquake in the future could lift the region higher, which would be a good outcome for the business. Of course, an earthquake could also sink the region back down to a previous level. The owner tries his best to think positively about the future of the climate, as they does not know how the region will change themselves.

Future-proofing the business is not something that the restaurant has invested in, and they do not really know how to. The main future-proofing that the owner knows will happen eventually is to the menu. Because of fish becoming more scarce and expensive, the kinds of fish on the menu will have to change over time. Along with that, other nations willing to pay more for fish makes the market much more competitive. The owner thought of how the nation itself could future-proof, and considered the nation exporting much less than it currently is. This would allow for locals to enjoy their own native products, and having higher quality food. An example they gave was the Bluenose fish, which could stay local in New Zealand instead of being exported.

The restaurant has changed how they do business as a consequence of climate change in one main way: their providers. They have had to look into finding new providers, as well as seeing who has the best prices. In the past, they used to just use one provider, but that has become nearly impossible in recent years. They also try their best to keep good relationships with their suppliers, and pay them on a weekly basis as opposed to the typical monthly payment. This way, they can keep in touch with them more often and it also sets them apart from other restaurants.

The owner stated that they have seen very, very little industry wide support for retrofitting to adapt to climate change. He is aware of some talks about it, but they are very few and far between. They wish that the government gave more support to small businesses to retrofit their locations with green energy, like solar panels. The location of the restaurant would be ideal for solar panels, as they get direct light on their roof for most of the day. The issue is, that a full retrofit would cost more than \$100,000 NZD to do it themselves. If the government helped them, not only would it be more affordable, but it would make the restaurant more sustainable for years to come.

Appendix E - Interview 4 Summary

The fourth interview conducted was with a local wallpaper manufacturer and distributor, where I spoke to the general manager of the organization. The scope of the business in terms of environmental threats had a much wider range than I would have expected before the interview began. Firstly, the general manager discussed how supply chains affect their business. I was told that most of their supplies for manufacturing newspaper comes from the Northern Hemisphere, which entails long trips for the suppliers. Climate change plays a role due to the sustainability aspect, as well as the materials themselves. Paper and paper supply has been impacted by climate change, making it harder for them to get. As 60% of the businesses volume of materials is imported, they rely heavily on the supply chain. All of the base paper they use comes from the United Kingdom, while their paints come from the United States. Overall, the supply chain has put pressure on the business.

In addition to the supply chain, increased rains in the area have led to flooding of the plant on some occasions. Although it is out of their control, the local stormwater system is not designed to hold the amounts of rain in recent years. This led to them backing up, overflowing, and in turn overflowing their gutters, causing water to pour into the warehouse from the roof.

The climate does have the potential to affect the workforce at this business, mainly due to earthquakes. As some employees live an hour north of the facility, the potential of an earthquake destroying roads is a real threat. The general manager said that employees could get stranded at the warehouse. Along with earthquakes, more flooding up north in recent years had made it more challenging for these employees to

get to work as well. Regarding the economy of the business, climate has played a factor there as well. In this area, it is the ferries that travel to the south island of New Zealand with their products that have ran into issues. If the weather conditions are not favorable, then the ferries to not go to the south island, and wait for better conditions at a later date. The general manager told me that storms, and winds from those storms in particular, have gotten worse in recent years. They also believe that we have gotten more safe, and are less likely to take risks on trips than in the past. This combination makes delays in shipping happen more frequently, as when a day is missed, they must ship the goods from the missed day first.

The stormwater system mentioned earlier was the largest measurable change to the business due to climate change. The resulting heavier rains causing flooding at the business result in costs needing to be put into repairs of the business, and future proofing the building with new gutters. As mentioned, the large amounts of water were flooding over the top of the old gutters, causing water to flow into the warehouse from the roof. To combat this, the company lowered the downpipes of the gutters in order to ensure that the water level could not get high enough to flood into the roof. The business has also invested in waterproof covers for their more expensive machines, just in case of an extreme weather event.

The general manager shared some insight on a new phenomenon that they have noticed as of recent that may affect their business in the future. In the past, they have not had to worry about the temperature in the areas where they install their wallpaper. Now, due to the changing climate, it has become an issue for them. In the winters, there tend to be a two to four week stretch where the weather is particularly cold. The

process for installing wallpaper is as follows; They use a wood fiber base, and the actual vinyl wallpaper. In normal weather temperatures, the wood base will expand, and the vinyl will stay stuck to that base with a paste. In the cold stretch, however, they have noticed that the wood does not expand due to the temperatures. This results in the wallpaper trying to curl and peel itself off of the base, which is an issue. Another potential future issue relates to warmer temperatures. If it is too hot, the paste they use dries faster than usual, typically before the wallpaper gets fully stuck. This can cause issues with seams in the wallpaper, making the job harder than it typically is. Along with this affect from warm weather, the ink they use also needs to be thought of. The general manager said that when they were located in Auckland, they needed to have air conditioners in the ink areas due to it being warmer up north. Without the air conditioning, the ink would dry out before it was fully used, causing a financial loss for the business.

When ranking climate change impacts among other non-climate threats for the future planning of the business, the general manager told me that climate threats were low compared to other issues the business had. For them, making sure that they can secure their supplies is out important. As stated previously, they get their paper from the United Kingdom and their paint from the United States. Along with these locations, they also get their potato starch paste from Ukraine, where recent wards have made it difficult to secure supplies. The brand that they rely on for digital printing purposes is located in Israel, which has also had recent conflict, which affects the supply chain. Compared to these issues, climate threats are low on the list of concerns for the business.

When asked about what concerns the business the most about climate change, the two answers were the recent influx in flooding, along with the required temperatures for wallpaper installation.

The general manager did not have any specific examples of changes to the business due to a consequence of climate change off the top of his head. They are going to have to change suppliers, but they believe climate change would be a very small part of that, if at all. He understands that getting a supply chain to New Zealand is a difficult task, due to the remote nature of the country.

As they are the only wallpaper manufacturer in the entire Southern Hemisphere, they have not seen any sort of industry wide support, as they are the industry here.

Appendix F - Interview 5 Transcript

Interviewer: Just a bit of background on this project, it is relating to climate change and how it impacts your business. And it's not really a question of where does it come from and why is it happening, it's really just about if you've noticed changes in the weather or the climate and how you've had to pivot as a business to accommodate for that. So the first question would be, "what is the scope of your business in terms of vulnerability to environmental threats." And some example of that could be office space or offsite production, remote workers or in person workers, transportation to where you have to go, supply chains and things like that.

Interviewee: The area I work in is leadership development and team coaching. And so the only impacts of climate change that hasn't been happening, indeed it has just surfaced probably five years ago, was the whole concept of travel, at least air travel. It is a little more problematic, not so much in the private sector but in the public sector where, for good reason, there should be a clear responsibility and accounting. For reasons between the fact that it's tax payer dollars through the government, they set the tone for many things. Now, being in leadership development, the team element, the best setting for my work is in person. So, we are all in a room together. Now, if that team is in Auckland and I'm in Auckland its no big deal. I drive my EV, and feeling just fine about that. If I have to travel to them, well, it's just one person. And I have forever, I'm not quite sure exactly how long, 10 years maybe, but on Air New Zealand you scroll down and you can click a carbon offset option. And I have done that for as long as I can remember. Just because I have always thought that was a responsible thing to do.

Apparently, by the way, you might want to ask Air New Zealand, but apparently when I last asked them years ago, they said that something like only 7% of people chose the carbon offset option. Which I found, to be honest with you, incredibly surprisingly low. And, disappointing at the same time. So I don't feel like I've ever really been restricted in my travels. But there have certainly been times, pandemic aside, when I've had clients say, "why don't we do some of these workshops" because typically I have a set of workshops for the program, "why don't we do, say, some of these over Zoom or something." So that, it saves the time expense, and the climate impact of getting us all together. So it's that, a travel thing, is the only direct consequences that I have experienced. And as I sit here and try to imagine others, it's kind of the only one I can imagine as well.

Interviewer: And obviously, it's probably also that you don't have in person facilities and things where you have to be there all the time and you're not manufacturing anything, right?

Interviewee: I don't do anything like that, and, well, right now I am in my home office. I like it like that. I'm not here for climate reasons, I'm here for selfish reasons, I don't have to walk far. And of course, in some secondary fashion, the fact that if I don't have client facing work on a day, then I don't need to drive my car, even though it is an EV. You know, I don't need to go out and use roads and cause a footprint. You know, I have to be honest, that's not the first thought I have when I wake up in the morning, but I

feel like I'm doing something towards the cause by not necessarily commuting, ya know?

Interviewer: Ya, exactly. Um, speaking of that pandemic, which everyone loves talking about, we've had to overcome some serious challenges in the workforce and the economy in recent years because of that, and I know workforce really doesn't have a play for you, because you're your own work force, but, based on the climate is there anything that you've noticed in the economy that could be a result of climate impacts?

Interviewee: Yes, cost. Principally, you may be aware, but, like everywhere in the world, New Zealand is experiencing increasing weather events. Or, greater frequency. Certainly magnitude, but they say, "that's once in 100 years" and now it seems to happen every five. I've never understood the "once in a 100 years" because I never thought we actually had that much data to know what once in 100 years is, but that's just my mind. So ya, like earlier this year we had a cyclone which was quite erratic, and it hit everywhere from about north of Auckland down to Hawkes Bay, Hawkes Bay was it's greatest impact. And if we just think about Auckland city, there were floods and lots of lives lost, which is obviously tragic, but there was also lots of damage to lots of homes. So climate change has become like another cost line on the profit losses sheet for the economy. And if we don't anticipate it, it will trip us up. From what I'm aware, now that I'm thinking about it, I've heard things where some, for example, agricultural crop producers, are saying that the seasons or the degree to which their crops prosper or don't, is evolving, and they can see the future where their crop, maybe their crops

will change, or at least the growing seasons have changed, and the levels of output are changing. But with 0 expert knowledge on that, you can just see that the impacts are going to go crazy. Like I recall from somewhere, if rice production gets disturbed by just a few percentage points, then a whole lot of people on Earth will be in a world of trouble.

Interviewer: That's interesting that you bring that up, I did interview a winery before, and they said similar things about how growing seasons are so erratic now, and they've had bad ones recently, and they're trying to figure out what to do.

Interviewee: Ya, and I guess its interesting with wine because its a very discretionary thing, you know its not like rice in terms of need. But, its kind of somehow appealing for the climate, sure there will be bad seasons, and that's more dramatic, but, you know, a variety of grape that thrives, shall we say just south of Auckland, what grapes prosper? It's going to evolve, right? Simply as the climate changes. And so, that could easily be taken as representative of hundreds and hundreds, if not thousands of species, right? I think that wine might be an interesting way, I mean you're old enough to know this, the battle in things like this is often not the knowledge, it's the getting people to kinda think about it. And wine could be an interesting way, like I don't know, hopefully you will end up posting about your work and offer your opinions to the world, it could be a very interesting post that uses wine as the way in, to catch the minds of people, you know? It's just that people who really care about wine probably have

money, and spend lots maybe on airplane trips and cars, you know? Maybe, I don't know.

Interviewer: That's very true, I think that's definitely something they touched on too is just the fact that the variety might have to change as time goes on. Um, in terms of measurable changes that you may have observed since you've started in your line of work, do you know any measurable changes that could be a consequence of climate change? And obviously, if you don't have any examples, that's fine too.

Interviewee: Not measurable, as I say, I don't believe the scale or nature of my business has changed at all. Like sometimes I've had to use online a bit more - and look, with the pandemic, we all learnt how to do that a bit better, it's not as good as in person, but it's better than we might have thought.

Interviewer: In your opinion, do you feel that climate change is a more imminent threat, or a more distant one?

Interviewee: Ooo, I'd have to go for imminent. Without any deep, genuine knowledge here, I've always felt that change is quite capable as presenting itself as incremental, until it doesn't. So I don't know, I mean I suppose none of us know truly the complexity of the system. But it's sure as hell a complex system. You know, the analogy that I have that I am familiar with is teams. And you know, teams can seem to be on a fine trajectory, on whatever it is, for a while, but when it goes right or wrong, it happens to

do so apparently quickly. Let's say that two people on a team don't get along too well, and then, *suddenly*, there's conflict! Maybe they just didn't talk to each other much for the last three months, but then suddenly there is a flare up. So, to my way of thinking, we would be far wiser to treat it as imminent than distant.

Interviewer: I totally agree with you there, and it's just interesting to hear different people's opinions. I feel like a lot of people feel like its imminent but they don't really know what to do about it.

Interviewee: No, because, I mean the truth is we don't actually know if it is, but even if we lay down the smart frame that surely it is, we're all then coming to the barrier of change. And this is starting to get into my area of work. Personal change is a deeply, deeply challenging thing. I've been involved with social change campaigns when I was living in Wellington 20 years ago, and you know about that time science came through, things like neurolinguistic programming, which suggested that you don't need to change mindset to change behavior. Actually, mindset can change behavior, but actually if you change the behavior, then the mindset will follow. And its interesting when you accept the fact that there are two ways you can change behavior, the first being that when you change the behavior then the mindset will follow, it kind of offers new opportunities perhaps, for triggering change. People I know and their way of thinking, I think become more relevant, a book called "nudge." So thinking like that, is interesting when it comes to this, you know. But personal change is massive and sometimes we talk it but we don't do it. In fact, if you're involved in research, you'll

know how many people in a research group say “I would but that cookie” and they don’t. Or, “I would never buy that cookie” and they do. Or, “I’d only buy petrol on the weekends” and they buy it on a Wednesday. Or whatever they say, the difference in what we say and what we actually do is horrifyingly dramatic. I’ve mentioned my EV, I was there about 4 months ago, truth is I’ve had it on my mind for a while, but then I wanted to get rid of my old car, I had an incentive that New Zealand had, still has, a clean car rebate. That got me in the market, then I got an offer that was not eligible for the rebate, but by then I was committed. And so I did it. But you know part of my rationale was we’ve all got to go there eventually right? In the cycle of my car ownership, as it was always going to, going about getting a new one came up, so this time around I went there. I could have gone last time, about three years ago, but there was not a large selection.

Interviewer: How do you think the climate change threat might potentially or theoretically affect your business moving forward, if at all?

Interviewee: We will have to get more virtual. You know, lets say there is a notion on spending less on air travel, there is going to be a period of time where air travel is pretty evil, and it will get more evil, and you know solid state batteries will power airplanes or something like that. So hopefully, I don’t know, in 10 to 15 years, there will be solid state batteries in airplanes and New Zealand already has a use of renewable energy, hopefully we can continue to lift that. And you know, then we can all fly as much as we choose without thinking we are putting 100 kilograms of stuff into the air.

But lets say in 10 years, I can see myself bumping into more clients that say “lets only get together on special occasions, could we please do it online.” But we can hope that tech will improve with these new Apple goggles, and we can get several pairs of those to improve the experience there. And you know, maybe instead of having a subscription to Zoom, I might have to go buy some universal goggles that will connect to Zoom, Teams, Google, and you know we would be having kind of goggle enhanced AI workshops. And my investment in that would be the hardware, not just a subscription to the software.

Interviewer: Among other non-climate related threats to your business, how would you rank climate change impacts for future planning for your business?

Interviewee: Just by my nature, I don't spend a lot of time thinking about my competitors or threats. When I was working for companies I didn't really think about the competition, you know, they can go do what they want really. It's up to us to go do what we do. The only threats that I can see are, me. That I don't do good work. I believe that my fate is far more in my hands than any competitors hands, way ahead of the climate. I mean, if anything, leadership, or leadership teams, they will need their leaders or teams to work better. And if it is facing external threats like climate change, then that draws them to give me a call and say “hey, can you help us improve the leadership team.” And, that can turn a threat into an opportunity.

Interviewer: That is very true, I mean if a massive company has a lot of issues relating to climate change, and there's butting heads in the higher leadership, you would definitely get a call to help them out.

Interviewee: I mean it happens all the time, it hasn't happened yet for the stated reason of climate change, but pretty soon climate change will be right up there for some companies with formulating a strategy.

Interviewer: I feel like you already answered this question, "which climate impacts concern you the most, if any," and that for you would really just be the airfare, right?

Interviewee: Well not the airfare, the carbon that comes out the back of the airplane, at a business level ya. Personal layer there is a lot more going on there but at a business level it would be that, yes.

Interviewer: Alright, just a few more for you. Do you think about future proofing your business for climate change at all?

Interviewee: No, um, you know, when change comes along clients may ask to meet in the middle instead of one place or another. Then you know, technology will offer a way forward and I will worry about that when those issues come up.

Interviewer: Do you have any specific examples of changes in how you do business as a consequence of climate change?

Interviewee: Only going virtual. Virtual workshopping, ya.

Interviewer: Alright, and one more for you. Have you ever seen or heard of any industry wide strategic planning for adapting to climate change?

Interviewee: There is an area in leadership, there is a person you may want to speak to named (X), there is a company called (X), and I actually used to work with them. They're kind of a leadership development company, based in Wellington. A person there is right into this space, of running leadership programs, which takes leadership management but makes sustainability the doorway into the conversation. So its kind of sustainable leadership development.

Appendix G - Interview 6 Summary

The 6th interview conducted was with a local florist in the Wellington area. When discussing the scope of the business in terms of environmental threats, there was one main area mentioned, which was supply chains. As Wellington is an urban city, there is nowhere for large amounts of flowers to be grown. Because of this, the business sources flowers from all over New Zealand to sell to their customers. In recent years, however, getting an adequate amount of flowers for the business has been a challenge. When big storms come through, the suppliers stocks can be heavily damaged, especially if they grow outside. Even if they are in a greenhouse, large floods can still make their way inside and wipe out the supplies that way. Along with this, recent cyclones have made it difficult for suppliers to ship their products, due to damaged roads.

While the business has not had any issues with their workforce in recent years, the economics of the company have been impacted by the previously mentioned climate impacts. When the suppliers have their crops damaged, the business has a much lower supply for their customers. Because of this, the business has to raise prices on their current bouquets, or provide their customers with smaller bouquets at the same price. They also must navigate higher prices for the business due to limited supply, and change their customers expectations about their product offerings.

The owner did provide me with a few examples of measurable changes that have occurred to the business since they started. One example would be that some of the suppliers to the business have closed down due to climate related threats to their business. Along with those climate threats, the cost of transportation has caused them

to close, which could also be a result of climate change. As the owner said to me, “Small growers see the prices in the [transportation] market go up, and it makes things harder for them to compete.” While some suppliers can use motor vehicles for transportation, some locations have to use airplanes, which also makes it less cost effective. Along with transportation, the owner stated that since they stated, there is less availability overall for the business. With this lower availability, they noted that the quality of products has also gone down over time. The owner is not sure why this is the case, but they believe that it could stem from the fact that it is less cost effective to transport quality flowers.

In the owners opinion, climate change feels like an imminent threat. As their product is reliant on reasonable weather, the fact that “the climate can change so quick” puts pressures on the business. Cyclones have always been an area of concern for them, but in recent years it has gotten much worse. The owner said to me, “Probably even in the last year, there has been a big change regarding the flooding of greenhouses.”

Climate change might potentially or theoretically affect the business moving forward mainly from the areas already mentioned; Supply chain issues, supplies being destroyed by large weather events, and their prices and products may need to change as a result.

Climate related impacts are very high on the owner’s list, even compared to non-climate related impacts. This is because flowers are very dependent on the climate, and the business is very dependent on their flowers. The owner said the only other risk that the business faces would be a major earthquake in the Wellington region.

In terms of climate impacts that concern the owner the most, there were multiple that they mentioned. First would be the major storms and the flooding that was mentioned earlier. Another point mentioned was the fact that the industry as a whole is not good enough in terms of recycling. That mainly related to the plastic wrappings around the bouquets that are sold, and the styrofoam blocks used to hold flowers. Transportation is another area, as the fuel used to transport the flowers can't be avoided, and has an impact on the climate.

The business has a few measures in place for future proofing, one of which consists of the products offered by the business. Along with their typical sales of flower bouquets, they also offer dry flowers, workshops, and different kinds of plants that are not flowers. This allows for them to still sell their main product, while also having a variety of options to make income for when flowers are hard to come by. Along with this, the business has moved away from plastic wrappings, and uses paper for their bouquets to be more sustainable. They also no longer use foam, which can not be recycled.

The business has changed some of their practices as a consequence of climate change. Along with the paper that can be composted, they also have compostable wet bags (the bags of water to keep the flowers fed for transportation). The business also tries to not over buy, and just have enough stock for the orders they have. The delivery system that the business undertakes has also changed. Instead of going from store to client on several trips, the business now takes one large trip to several clients in order to cut down on their emissions.

There is not a lot of industry wide support for the florist industry, other than the fact that one of the suppliers now have a return option for plastics used to transport flowers to recycle it. Another example could be that lots of florists are trying to stop using floral foam, but this does not necessarily span the entire industry.

Appendix H - Interview 7 Transcript

Interviewer: Alright! So, just to give you a little bit of background information about this project, it is relating to different types of businesses and how a changing climate might be impacting how they are doing business and how they are preparing for the future. So it's not really about where it's coming from, what's causing it or anything like that, it's more just about how your business is being impacted by it, if that makes sense. So I've got 10 questions for ya, hopefully it should take half an hour or less so I won't keep you here all day. And, just to start out, what is the scope of your business in terms to vulnerability to environmental threats? And some examples of that could be office space, or remote or in-person workers, transportation to your business, supply chains, or anything like that.

Interviewee: Um, at this stage reasonably minimal. So we are a very small, unique, boutique, niche, tour guiding business. So I'm pretty much the only person that's working in the business. From a climate change perspective, what I'm expecting to see over time is, particularly on one of our tours we do is a full day scenic tour out to Cape Palliser, the most southern point on the North Island. That road out to the cape is significantly vulnerable to extreme weather events, and I see over time, not in a long term but more in a short term, that there will come a point where getting out to the cape will not be practical. Due to the encroaching sea and changing weather patterns. So, that will have an impact on me, so potentially we will have to drop tour, but um, other tours that we have, not really impacted by climate change per say. That's really the only one I have a serious question mark on long term.

Interviewer: And, obviously in recent years we've had to overcome some serious workforce and economy issues with the pandemic happening, and all of that. Does the treat of climate change play into that for you as well, in terms of the workforce and the economy?

Interviewee: Uh, not really. I don't see, there are no significant risks that effect me. It's just something from a small operator on the climate change front, we just gotta be very conscious, be responsible, and ya know we do everything we can around sustainability and environmental impacts. For example, we offset carbon emissions and important things like that. So, it's just being mindful of all the little things that we can do. They might seem minuscule to a lot of people, but every little bit helps.

Interviewer: And, in terms of your scope of business and the type of business that you run, have you noticed any measurable changes since you've started out in your line of work that could be a consequence of climate change? And I know you already discussed that one tour that you have.

Interviewee: Uh, ya, so we have only been operating - I'm one of the very few businesses that, in New Zealand, entered the tourism sector during the global pandemic. So, we established our business in December 2020, and over the last three years, I've seen the mountain range, when you get out of Wellington and get over to the Wairarapa region, is subject to increasing numbers of weather events, ya know

earth slippage. In fact, only a couple of months ago, the road had to be shut for a couple of nights because of extreme winds. So ya, there's definitely things going on that, from a climate perspective, that impacts the tourism industry here.

Interviewer: And, in your opinion, do you feel that climate change feels imminent or distant?

Interviewee: I think we would be pretty naive to say that it's distant. It's a real thing, and we are seeing evidence of it happening now. We might feel like we're isolated from everything down at the far bottom of the world, but there is stuff going on. So I'm 58 years young, and in my lifetime I've seen the seasons change. The seasons seem to move a bit, they've been pushing out. Ya, things have definitely changed, we've seen things popping up, for example there are things are popping up in our garden that shouldn't be popping up that time of year. Yep, somethings going on.

Interviewer: Exactly, that's been the consensus from most of the people I've talked to, is that something, wether its been a recent phenomenon or not, there's definitely something changing. Um, I think you've already answered this question through other questions, but how do you think climate change could potentially or theoretically affect your business moving forward?

Interviewee: Ya, I answered that one early on. So it's really about that, there might be some impact from having to drop a couple of tours from our list of products. You know,

there will be a small revenue impact, but certainly not insurmountable. You've got to pivot and navigate around these things.

Interviewer: How would you rank climate change impacts among other non-climate threats to your business?

Interviewee: I would classify, from a risk point of view, I would say climate change would be 20% of risks in my business, roughly. Compared to other identifiable risks. And look, if we take a realistic view, you can expect that ratio to increase over time. Across a lot of businesses, I expect.

Interviewer: And, which climate impacts concern you the most, if any?

Interviewee: I think from a human on this little globe here, the thing that concerns me the most is the rising sea. Ya, rising sea levels.

Interviewer: Ya, of course. And that also ties back into your, that one tour that you mentioned at the beginning, at the bottom of the North Island. The road could just, ya know, not be there anymore.

Interviewee: Ya, over time we will see it. You could potentially see a hell of a lot of people displaced over the next 50 years from their ideal coastal residences.

Interviewer: That's very true. I'm from Boston, Massachusetts, in the states and e are already seeing some of that, like floods that, usually there are a few floods, just because it's so close, but the rate at which it's happening is just taking off.

Interviewee: Ya, thats a good point, because you know, once upon a time, we were talking about once every 100 years storms, and it seems to be once every five years now.

Interviewer: That's so funny you say that, someone else in another interview said exactly that. They said "100 year storms, I don't know why, but it seems like we're having a 100 year storm every 5 years." So it's definitely an interesting thing to see develop over time. Um, do you think about future proofing your business at all? I don't know if that is necessarily very applicable just because, I don't know how you would future proof the land that you give your tours on.

Interviewee: Ya, that a tough question. Um, just thinking, circling that back to climate change, if we look at the Martinborough, the Wairarapa region, which is predominantly famous on the wine industry, for example, for its Pino Noir, we will see over time that customers won't be sampling a lot more Pino Noir, because the climate's changing so much that wine makers are now starting to pivot into growing more and more Syrah, which is more conducive to the new climate we are in now. Rather than the Pino Noir climate. So, content of wine tours could well change as a result of climate change. But ya, for a lot of people wine is wine.

Interviewer: Do you have any specific examples of changes in how you do business as a consequence of climate change? And that could be a change in costs to the business, or change in time you're spending.

Interviewee: Uh, nothing tangible jumps to mind straight away, so nothing yet. But it's - it sits in the back of your mind from time to time. You run a few 'what if' scenarios in your head. And you park that and come back to it, maybe 6 months later. But no, not really. I think from a small business operator, and it's sort of loosely linked back to climate, but we're getting very very close to dropping our old, 100% petrol vehicle for a new, more economically and fuel efficient hybrid vehicle. So you're gonna see more and more of that sort of purchasing decision really ramp up.

Interviewer: And I got one more question for you. Have you seen any support for industry wide strategic planning to adapt to climate change?

Interviewee: Yup, so in New Zealand we have a very strong tourism industry, Aotearoa. So they are an industry advocate group who work in quite closely with government departments and all the key local and central government stakeholders. So, any industry related issues are top of mind for them. So, tourism industry Aotearoa. TIA.org.nz. Worth taking a look around to get some background info from your perspective.

Appendix I - Interview 8 Transcript

Interviewer: Alright, so just to give you a little background on the vernal idea of this project, it is about small and medium businesses and how climate change is either effecting them currently or could be in the future. And it's not really about where climate change is coming from or what's causing it to happen or things like that, its mores just about how the business is being effected by it, if at all. So, the first question I have for would be, "What is the scope of your business in terms of vulnerability to environmental threats?" And that could be office space, off-site production, transportation, global supply chain, or anything like that.

Interviewee: So we sell time. We don't have resources, we don't rely on products, we don't rely on crops, so anything like that or manufacturing, or anything like that, so we sell out time. The effect of climate change, I would suggest, has little impact on our business, other than extreme weather events would and have interrupted our business as so far as people haven't been able to get to the office. And then people have then had to work at home, but then when they worked at home we did have, me personally I didn't have power for two days. Thankfully, I have a generator but I know a lot of others didn't. So if we are going to take it to that kind of extreme weather event, caused by climate change, then that is an impact. But generally, we're not effected unless there is an extreme event.

Interviewer: In recent years, we've had to overcome some serious challenges in the workforce and economy with that pandemic that everyone loves to talk about. Have

you noticed any potential threats that climate change could have to your workforce or the economy of your business. And I know you just kind of touched on the workforce.

Interviewee: Ya, I mean, if our workforce can't get into the office or can't undertake their work, then that means that others are in the same boat. Because obviously an extreme weather event doesn't isolate just us, so no. Yes, it would impact everyone else on the design team, because we are part of a multidisciplinary design team.

Normally when we are delivering a project, we do it with a lot of different engineers and plan managers and architects, so yes. Going back to the storms, a lot of other people were effected. Delivering projects was problematic.

Interviewer: And have you noticed any measurable changes since you've started in your line of business that could be a consequence of climate change? And that could be ways that you run your business or make decisions.

Interviewee: I think up until the weather event that we had at the beginning of the year, and with covid as well, it's highlighted the importance of resilience of IT equipment and systems and things that are connected to our network. Having policies and procedures in place such that - we don't have desktop PC's anymore, we all have laptops. And the policy is that you take your laptop home, you don't leave it in the office. So just from a business continuity perspective, it doesn't necessarily need to be climate change, it could just be "there is a full for whatever reason," it could even be a fire in the office. But, ya our policy is have mobile decides, take them home, and have strong IT systems

that allow us to connect. So we moved from a server based IT system to a cloud based one. So we've modified the way that we work by having resilience with our IT systems. And because we have flexible working hours and working from home policy, we provide IT equipment at peoples homes as well.

Interviewer: In your opinion, do you feel that climate change feels more imminent or distant of a threat?

Interviewee: Imminent, it's here. Happening now.

Interviewer: And do you have any ideas on how climate change might potentially or theoretically effect your business moving forward?

Interviewee: Other than a repeat of what we've already had, and more of it. And, personally, where I was living, the road infrastructure and the ground conditions were not designed or manufactured to accommodate frequency of events or severity of events. So, the ground could cope with moderate amounts of rain, but lots of and high levels of severe events highlighted more of an issue.

Interviewer: And, among other non-climate threats to your business, how would you rank the importance of climate change impacts for your future planning?

Interviewee: I don't know if we would have to do more than we have already done, I think what we have in place in terms of being able to deliver the products that we produce from our time and providing advice. As long as the national infrastructure is in place, as in telecommunications, and power, then that sort of stuff is out of our control from a business planning point of view, I'm not thinking that we need to do anything else at the moment.

Interviewer: And, which climate impacts concern you the most, if any?

Interviewee: Hm. I would say it's one extreme to the other. I suppose it would be no rain to too much rain. So, I don't think winds are too much of an issue, but it seems to be long periods of drought, and long periods of rain. So certainly this year its certainly been a key driver for us to move from where we were living to where we are now. And I suppose the other thing is that we haven't got - we've got 5 million people, and I was in Napier a few weeks ago, and seeing the destruction down there from the floods and the crops have been wiped out and the land is just totally decimated. It's eye opening, but ya, we are a small country - well, the same geographical size as the UK, but ya know, a fraction of the population. So we don't have that many resources from a civil contingency perspective, we don't have the backup. We've got the emergency services, just not the same resources as other nations in these types of emergencies, so we would be heavily reliant of Australia or something like that for help.

Interviewer: And I think you've already touched on this, but do you think about future proofing your business for climate change at all? And I think you answered about the portable IT devices and things like that.

Interviewee: Ya, I can't think of anything else. I suppose it's just moving with the times really, but we will also look into getting EV's.

Interviewer: And I've only got a couple more for you today. Do you have any specific example of changes to how you do business as a consequence to climate change? And I think that would be the portal IT devices as well, right?

Interviewee: Ya, I think just that being able to work from home and still carry on working. I mean we were fortunate really that our business didn't suffer financially too much during the pandemic, we were still able to keep doing what we were doing.

Interviewer: And one more for you, have you seen any support for industry wide strategic planning to adapt to climate change?

Interviewee: No I haven't, no.

Appendix J - Interview 9 Summary

The ninth interview conducted was with a local Pastaria in Wellington. In response to the first question, the respondent mentioned several areas of the business where the scope was impacted. Mainly, the different aspects of the business relate to the types of products that the business can offer to their customers. Weather impacts becoming more severe has made the supply chains the company uses more difficult, in terms of availability and price. Particular items that the store often uses have seasonal growth, and severe weather events in New Zealand have made these items unavailable at times. A direct example is the wine that the business provides, with some varieties coming from Hawkes Bay. After recent extreme weather events, all shipments of wine from this area were halted, causing inventory issues for the business. When the products are out of season, they need to import items from other nations, increasing costs. Some items become so expensive that the business has to pivot to other products, as to not increase the prices for the business and their customers.

While the climate has not affected the businesses workforce, they have noticed changes in their personal economics. As stated, climate issues can cause severe and sudden fluctuations in price. As New Zealand is a remote nation, they tend to import products that are hard to find within the nation. Weather events can cause these international shipments to get a large backlog, often making shipments more expensive and late to arrive. Another issue with this is that products that are produced in New Zealand are often exported to other nations, causing availability issues for companies in the nation.

Similarly to previous answers, the respondent has noticed many changes in the supply chains they use since starting out in his line of business. Along with these changes, the price of gas has been an impact the business has noticed. Using gas stoves has been less and less sustainable for businesses due to the price of gas, and the business has moved to electric stovetops because of this. Another item the restaurant frequently uses is canola oil, which has also seen an increase in prices in recent years.

When discussing if climate change felt imminent or distant, the respondent told me that they felt like both of these were applicable. They felt it was imminent because of the changes happening season by season that are visible to the people who live here. While it is imminent, the respondent also felt it was distant in the fact that it will be a long term issue for years to come. Mainly, the sense that it is getting more severe and the fact that not a lot is being done to stop it are reasons to believe it will be a distant issue as well.

Potential and theoretical threats to the business also relate to the supply chains that the business relies on. Overseas prices will get far more expensive in the future, the respondent believes. Not only basic items that the business uses on a daily business, but also commodities like olive oil could become too expensive for the business to obtain. Along with overseas imports, local goods could see threats in the future as well. Constraints on local farming regions could get destroyed or increase in price dramatically, assuming that the climate and extreme weather events continue to worsen over time. The water system in Wellington is also a concern for the business, as

it is outdated and in need of repairs. With extreme weather events in the future, the water system could experience failures, causing major issues for the business.

Climate related impacts are relatively high on their list of concerns, as opposed to non-climate impacts. The respondent stated that climate change felt like, “A big cloud hanging over us, and there are other things at the root of that cloud.” Some of these things are the supply chain as well as the local waste management system. The respondent stated that there is no real forward thinking in the waste management area here, and they have to worry about how they do recycling on their own time. The respondent feels like this is an issue because the local governments and council aren’t in a position to deal with it, as they have too many other things to do.

The climate impacts that concern the business the most also relate to the supply chain, mainly the scare of resources drying up and becoming harder to find. This also means that the cost of the food they obtain can fluctuate a lot, resulting in raised prices. This is important for the food industry, as it can be difficult to raise prices and still have many customers come in. In order to make profits, they need to be very precise with their pricing for customers.

The business is currently future proofing, and try to as much as they can. Instead of doing so physically, like retrofitting their building, they try to future proof fiscally. Making sure they have enough capital to manage the fluctuating prices of their goods is important to them, and helps them maintain their current menu for longer. With that being said, they are also future proofing their business by changing their menu when needed. An example of that is switching away from meat. They still use it in some of their offerings, but they are trying to move towards more vegetable options.

This is not only cheaper for the business, but they are also easier to substitute out for other replacements when they need to due to price.

A specific example of changes to the business due to climate change is the menu that they offer. While they are already adapting the menu, they feel that this will become a more pressing issue in the future. Because of this, they are already having meetings at the business about potential substitutes and menu changes that they are anticipating in the future. The main reason for these changes are price, and availability.

The respondent did have specific examples of industry wide support to adapt to climate change. Mainly this support is food related, as that impacts the business heavily. The respondent mentioned a conference that they attended in Auckland, where there was a discussion of sustainability and how to incorporate these practices into the business. The respondent mentioned steps that the business is already taking, such as being conscious of their carbon footprint and trying to have less environmental impacts overall. A main point was the waste system and waste removal, which is an issue for the business currently. Recycling and the current system in place is difficult for the business, as it does not seem to be a highly discussed topic in the art. Making sure to strive for better recycling practices is a point of note for the business, and they are trying to improve the way that they recycle their products.

Appendix K - Interview 10 Summary

The final interview conducted was with a local art gallery and book shop. When asked about the scope of the business in relation to threats from climate change, the main aspect of the business that is affected is the businesses supply chains. When there are large storms, freights from the south island that come to the north can be delayed, resulting in longer wait times for inventory, as well as specific orders for customers.

For the owner, there have not been significant challenges in terms of workforce or economy for the business as a consequence of climate change. Along with this, there have not been any measurable changes to the business that are a direct consequence of climate change.

When discussing climate change directly, the owner of the business felt that the threat of climate change was rather imminent. They felt that we are currently living through it, and that he is surprised that all people do not feel this way.

Future threats as a consequence of climate change is something that the owner had multiple points on. Firstly, the access to their business may be impacted by severe weather events. As they are a storefront on a busy street in the city, they rely on people walking by the store, or walking to the store in general to get their orders. If severe weather events continue, people may not want to come to the store due to the harsh weather. Along with this, the way that the supply chains affect the business may change over time. In the past, the owner discussed how the business got their supplies through sea freights. Because of this form of transportation, the business would have to wait between four and eight weeks for inventory to get to the store. Since then, air

freight has become the main form of transporting inventory to the business. Because of this, wait times can be as low as two days, and on occasion up to five days. Recently, however, the owner has noted that some companies have gone back to sea freight, whether it be for cost or sustainability reasons. Because of this, the business may have more extended shipping times in the future if the climate continues to worsen and companies prioritize sustainable practices. Not only would this affect the inventory of the business, but it would also require changing customer expectations, which can be difficult.

Non-climate related threats to the business do rank at the top for the owner, who stated that the economics of the business is top priority. Other than that issue, climate change is the next in line, and is an important factor for the business. Other than these risks, the owner feels that there are no other risks to note.

When asked the climate impact that concerns them the most, the owner states that it would be the changing weather patterns. This is because of the point mentioned earlier about accessibility, as it may become difficult for people to come into the business, or the city in general.

At the moment, the owner is not thinking about future proofing their business for climate change.

The only specific example of changes to how the owner does business as a consequence of climate change would be the times that the products get to the business, and curving customers expectations, as previously mentioned.

In terms of industry wide support for strategic planning or retrofitting to adapt to climate change, the owner could not think of anything he has heard of or is aware of.