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Student Research Report

Representing Women's Climate Narratives Through Art

Prepared by: Simone Rawal, Elizabeth Jackson, Taya Triffo, Lindah Ddamba, Diana Bedolla López, Sandra Sun, Lekha Tlhotlhalemaje

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REPRESENTING WOMEN'S CLIMATE NARRATIVES THROUGH ART

Simone Rawal, Elizabeth Jackson, Taya Triffo, Lindah Ddamba, Diana Bedolla López, Sandra Sun and Lekha Tlhotlhalemaje

RES 510 Social Ecological Systems

Abstract

Recognizing that women are disproportionately affected by climate change, that different women experience the changing climate differently and that women are often represented as purely victims of this phenomenon, we hoped to create spaces for women and non-binary people to share their narratives of climate change. Using memory work and arts-based methods, we facilitated a focus group and an art-sharing session, where we welcomed women and non-binary folk to express their climate stories, through writing, speech and/ or art. This paper includes a discussion of our background research and the methods we employed, an exploration of several of the themes that emerged from the events as well as an analysis of the theory and limitations of this project. This project culminated in an ArcGIS StoryMaps website, where we share the art that came out of the events as well a toolkit sharing guidance and recommendations for people hoping to lead similar focus groups or events. This project reveals the importance of thinking about climate change in feminist and intersectional ways that recognize the different power dynamics—including gender, class and race—that affect people's experiences of climate change.

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1.0 Introduction

"There is no greater agony than bearing an untold story inside you"

- Maya Angelou, *I Know Why the Caged Bird Sings*

Recognizing that many people have climate or environmental stories that they have not necessarily had a space to share is what, in part, motivated this project. Storytelling is a powerful mechanism for people to reflect on their own experiences, build community and solidarity with others, and organize for change. There are no barriers to entry because everyone is an expert in their own lived experience. Our project hoped to create spaces for women and non-binary people to share their narratives of climate change and climate change activism. Importantly, our project emphasized collaboration and community, because sharing one's story is one thing, but having an empathetic audience and developing community and solidarity is essential.

The work of Harris (2021) highlights the importance of narrative political ecologies. In doing this project, we hoped to challenge common narratives of women and non-binary people as victims of climate change (Cwienk, 2020). It is true that women are disproportionately affected by climate change (IUCN, 2015), but that mere fact barely scratches the surface of the myriad of experiences of women in the climate crisis.[1] Moreover, structural forces like patriarchy, neoliberalism and neo-imperialism shape the lives of women and non-binary people around the world (Klusener, 2018). And climate change only exacerbates these existing inequalities. Although there are many commonalities between women's experiences of climate

[1] There is less data on non-binary people's experiences of climate change. But it is likely that the patriarchal systems in place likely disadvantage non-binary individuals as well.

change, these are greatly coloured by factors like race, age, national origin, et cetera.[2] We hoped to highlight these complex themes and differences while also underscoring the important roles that many women play in the climate movement. Overall, we were interested in exploring these narratives in ways that celebrated the subjectivity of the narrators, recognized the different broader forces that affect people's lived experiences, and emphasized the agency that women and non-binary people have.

To give a broad overview of the project, which happened in the context of RES 510 (Professor Harris) in collaboration with the University of British Columbia's SEEDS Sustainability Program, we employed two methods—memory work and arts-based methods—in representing women and non-binary people's climate stories.[3] First, we organized a workshop where we asked participants to share a climate memory and to create artwork. Embracing feminist methods of participatory research and reflexivity, members of our group also participated in the workshop. A couple of weeks later, we organized an art studio where we invited three artists to share their work which related to both their personal stories and climate change or the environment more broadly. We were really grateful to observe the enthusiastic participation in the focus group and the generative discussion in the art studio. We used the insights from those two sessions to create an ArcGIS StoryMaps website sharing all the art alongside some quotes and to create a toolkit for other people hoping to create spaces for people to share their climate stories. Overall, we hoped to do a collaborative project, where the outcomes were both the content that arose from the workshop and studio, in the form of themes

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[2] Note that when we say women, we refer to cisgender women, transgender women, gender non-binary people (who, of course, are not women but are a marginalized gender group).

[3] Note that we designed our project in a way that complied with the UBC Research Ethics Board application for RES510 (Ethics ID Number: H20-01604)

and artworks, but also a better understanding of the process so that we could share these methods with a more general audience.

This quote from the focus group highlights a key theme throughout this research. After sharing memories, one person noted,

> *That was something that was common throughout the three, throughout the sharing was that, you know, memory is the thing that makes our climate actions or climate activism, in some ways, quite concrete. And that's such a paradoxical thing to put next to each other, because memories by their nature seem fleeting and subjective. But in a sort of a strange way, it's what actually has spurred some subsequent engagement with climate change and climate activism.*

This highlights some of the themes that we were hoping to pull out in this research—the links between memories and our commitment to the climate movement, and between memory and action and also how subjective memories can be meaningful and have real-life implications.

Having introduced the topic, next we will provide a brief literature review on women in the climate crisis, followed by a breakdown of memory work and arts-based methods. After that, we will give an overview of the focus group and art studio themes, followed by a discussion of the theory and limitations of this project. Finally, we will briefly discuss our toolkit and recommendations.

2.0 Literature Review of Women and Climate Change

For many years, the scientific community has struggled when trying to link climate change to social development. The main reason for the lack of awareness of climate change's social impacts is that climate change is perceived solely as a scientific issue. However, the negative impacts of climate change in society, like extreme weather events, have demonstrated that this problem goes beyond scientific knowledge and affects millions of people.

These impacts vary among regions, generations, age, income groups, and genders. In addition, the people who are already most vulnerable and marginalized will experience the most significant impacts. In this sense, women are often more vulnerable and experience climate change differently than men. These gender inequalities affect women's ability to manage adverse situations (Aguilar, 2009; Dankelman, 2010).

Women are more vulnerable than men to the impacts of climate change mainly because they represent the majority of the world's poor and because of their roles and responsibilities, like the small role they have in decision making that usually affect their opportunities and overlook their needs. For instance, some of the areas where gender roles and relations interact with climate change are limited access to resources and use patterns, adverse effects of climate change such as environmental disasters, aspects of mitigation and adaptation, decision making on climate change, and food security (Masika, 2002)

Women can also lack access to information, education, jobs, housing, and health services, which is part of the reason women experience more significant negative impacts of climate change (Castañeda Carney et al., 2020; Johnsson-Latham, 2010; Momtaz & Asaduzzaman, 2018). For instance, Neumayer and Plumper (2007) explore the effect of natural disasters on gender and found that large disasters lower the life expectancy of women more than men.

Some examples of the direct and indirect impacts of climate change on women in developing countries are the increasing workload due to crop failure, taking more time for water collection, high incidence of mortality during natural disasters, lack of access to health care and forced migration.

Raising awareness about the unequal impacts of climate change is fundamental to understanding women's potential role to act as leaders. Despite recognizing this gender gap,

climate change initiatives and programs rarely acknowledge the links between gender and climate change (Aguilar, 2009). International organizations (IUCN, 2015; UN, 2009) have highlighted the importance of applying a gender analysis to climate change actions.

Moreover, to overcome these gender inequalities, women need to have equal access to information and spaces to discuss their concerns. Designing and implementing gender-responsive strategies and programs in which women can participate is crucial to supporting women in developing a voice.

In this sense, we recognize that women are not just victims but crucial actors because they hold unique knowledge and skills to fight against climate change. As providers of food and water, educators, entrepreneurs, health care providers and caregivers in their families, women have stood up, spoke out and demonstrated that their leadership is critical to find solutions. Many studies have demonstrated that women have been essential in organizing themselves around environmental issues. However, it is important to not see women as merely instrumental for climate action; women must benefit directly from the shifts in paradigms in climate change actions (Dankelman, 2010; Masika, 2002).

Developing meaningful opportunities for women's participation in climate initiatives and programs will help us uncover blind spots and better address the climate crisis. Cohen (2017) suggests that a gender-sensitive approach will contribute positively to climate commitments and equality and justice more broadly.

To win the race against climate change, it is crucial to understand women's livelihoods and vulnerability to grow awareness and build resilience to climate change for a sustainable future. Raising awareness is not merely about increasing knowledge about climate change but about creating a broader frame of involving women in decisions that may affect their future.

Raising awareness about women and gender equality is crucial for generating public support for initiatives and encouraging behavioural changes regarding climate change (McNamara, 2013; Momtaz & Asaduzzaman, 2018).

In this sense, our project is not only about raising awareness around climate change; the main focus is to explore women's complex narratives of their lived experiences engaging with climate change (Harris et al., 2015). We engage these narratives through artistic creations that allow alternative perspectives to emerge. The age of climate crisis brings an uncertain future, and these alternatives are an opportunity to imagine possible futures where women will be the catalysts for change.

3.0 Methodologies

Our research is motivated by the following questions. First, how can we represent women+ narratives of climate change in a way that recognizes structural inequalities, empowers them, and recognizes their agency? Further, what narratives do women share about possible climate futures and about their motivations for participating in climate justice activism?

Given these questions, our research group had conversations about the most effective way to design our research. Following these conversations, we decided on a three-part study, which involved a focus group, an art-sharing event, and a digital story map. Below, the theoretical foundations and practical elements of our research are described in further detail.

3.1 Initial Considerations

Our research group consisted of seven women, who were a part of the RES 510: Social-Ecological Systems course. As part of our initial group conversations, we shared ideas

with the SEEDS Sustainability applied research coordinator (Laura Arango), the course instructor (Dr. Leila Harris), and a SEEDS partner (Deb Pickman, UBC Arts and Culture District). These conversations cultivated a shared interest in the process and the outcomes of our research.

These initial brainstorming conversations can be summarized in four main themes. First, our group wanted to maintain a sensibility for the kinds of expectations we were putting on research participants. We asked: how have women already expressed their climate narratives, and in what ways should we ask women to share their narratives? Are our research activities asking women to take up art for the first time, or is this a method of expression with which they are already comfortable? Second, our group also wanted to be mindful about the kinds of social spaces that we were creating during our research activities. As best as we could, we wanted the research activities themselves to be conducive to our goals: to empower women. Third, our group wanted to be clear and transparent about the kinds of choices we made while planning our research, and why. This was part of an effort to be process-oriented with our approach (Caretta & Riaño, 2016; Hope Alkon, 2011). Fourth, we reflected about which women would we approach to take part in our research. We decided to include ourselves in the research process, as women who have our own climate narratives. Further, we opted to invite women and non-binary folks alike.

3.2 Ethics

We designed our project in a way that complied with the UBC Research Ethics Board application for RES510 (Ethics ID Number: H20-01604). All seven group members completed ethics training prior to engaging in research activities (either TCPS 2.0 CORE or CITI). We also

hosted all research activities online in consideration of COVID-19, and we followed the UBC Research Ethics Board's best practices guide for video conferencing.

The research team and our friends participated in the focus group, and our friends shared their art during the art studio. Other participants were invited to the art studio through an RES 510 class announcement and through the Institute for Resources, Environment, and Sustainability's department-wide email list and twitter account.

We approached consent in a way that was tailored to the participant and the event. The focus group participants (non-researchers) and the art studio artists all signed a consent form. The consent form outlined our research process, detailed the themes that would be used for a public report, and offered an additional consent line, where participants could opt in to having their art shared publicly. While registering for the art studio event, participants agreed to an abbreviated consent statement. On an ongoing basis, we have also checked back in with our participants and obtained their approval on content that we make public.

3.3 Research Design: Memory Work Focus Group

On March 20, 2021, we hosted our focus group, which was designed as a space where women's climate narratives could be shared, explored, and theorized. This online discussion lasted 1.5 hours and included fifteen participants: the seven women in our research group, and eight of our friends who identified as either women or non-binary. We shared privileges in terms of our access to higher education and our access to climate-engaged work as researchers, resource professionals, and students.

We opted to use memory work as the methodological basis for our discussion. Memory work was first developed as a feminist research methodology in the 1980s, and it has since been

used in feminist research (Onyx and Small, 2001; Haug, 1999; Nagar, 2016) and environmental science (Baroon, 2017). The method is interested in "the "how" and "why" of the individual's relationship to the 'givens' of their everyday life, and the way in which [women grow] into the structures of society" (Haug, 1999). Therefore, both memories themselves and conversations about what they mean are the crux of memory work. Memories point to the moments that women find subjectively important. In discussion of these memories, women can also collectively develop awareness of themselves and others, and the processes they go through shape their identity in the world around them.

We adapted the memory work method to suit conversations about climate and to fit a short, 1.5-hour discussion. In the first stage, participants individually wrote down a climate memory, being as descriptive as possible. Next, participants joined Zoom breakout rooms to discuss similarities and differences across their memories, with researchers and non-researchers being divided evenly. In the third stage, final reflections were shared regarding the process as a whole. Adding to the memory work method, we encouraged women to make art with the resources around them to express their thoughts, reflections and questions. This element was optional, but we incorporated it as a way to offer diverse forms of expression in the research process (Sletto, 2009). A short, anonymous follow-up survey was also shared with participants. We received four responses, where participants shared what they appreciated and what they would improve through open-ended feedback and ranked responses.

3.4 Art Studio

On April 3, 2021, we hosted an art studio event. This event was designed to facilitate a welcoming space for artists to share their work and articulate how it connects to climate change.

We were interested in learning how women and non-binary folks are representing and processing their climate experiences through art. What mediums are they choosing? Why? What does their art mean to them?

Three artists volunteered to share their art with us, and they each took approximately 15 minutes to present and discuss their art. Following the presentations, there were 40 minutes for the three artists and twelve participants to discuss connections to art, emotion, gender, and climate in greater detail.

We were intentionally open-ended with the kinds of art that could be shared and about the kinds of discussion that could be had. We wanted to leave room for the three presentations to share their art, as they understood it. We were interested in honouring multiple ways of knowing (Osei-Kofi, 2013). This approach was aligned with CreativeVoice theory (Rivera Lopez, 2018), which gives participants to choose the artistic mediums that resonate with them.

3.5 Digital StoryMaps

Finally, the digital story map was developed using ArcGIS StoryMaps website. This story map has a number of functions as a knowledge mobilization tool. First, the story map was developed as a platform for sharing women's many ways of knowing and representing their climate experiences. As a result, the art that was shared and generated throughout the research process is included on the story map. We also hope that this story map offers inspiration to other women and non-binary individuals who see this story map.

This story map includes a toolkit, which is designed to support other researchers or groups hoping to create memory work focus groups and art-sharing circles. The toolkit highlights some of the feedback we received from participants. As researchers, we learned a lot during this process, so we also developed the toolkit as a way to share our own reflections and

recommendations. We do not share this toolkit as an authoritative guide to research methods. Rather, this toolkit shares what we learned and to democratize access to the kinds of climate conversations we experienced (Caretta & Riaño, 2016)

3.6 Data Analysis and Outputs

By engaging these three methods in our research -- the focus group, the art studio, and the story map -- we had a number of different kinds of data to analyze. Of interest were:

- the content of the art and memories (*what narratives and art were shared?*)
- the participants' reflections about the discussion (*how were narratives transformed, discussed, and re-conceptualized during the research activities?*)
- the kinds of expressions that were chosen (*how were narratives accessed?*)
- the participants' discussion about different kinds of expression *(how do art and narrative facilitate connection to climate?)*
- recommendations for future research *(how effective were the research activities?)*

This variation created a number of possibilities for the kinds of outcomes and recommendations we could share. Our data analysis embraced this diversity.

Our group analyzed the focus group and the art studio separately, then we later analyzed our research process on the whole. We used our weekly meetings as a space to work out our analysis approach. We decided that we would analyze our research events with attention to three broad questions. First, we asked what kinds of climate memories, perceptions and experiences were shared -- what were our participants' narratives? This analysis involved looking at what details speakers chose to highlight as they spoke, and how they expressed the significance of their climate experiences in their lives. To analyze this narrative dimension, we developed written transcripts of each event using Otter.ai, and we saved the Zoom video recordings. Each

researcher individually reviewed one to three speakers' transcribed speech. This meant that at least three individuals reviewed each speaker's speech. While analyzing alone, each researcher used open coding and grounded analysis techniques to identify which themes emerged. Each researcher noted themes and supporting quotes[4], then shared these thematic summaries with the research group. In a following group meeting, each researcher shared their identified themes and their evidence, then we developed a list of themes and fleshed out definitions for the themes. Although there were no significant disagreements about themes, these group meetings offered a chance to clarify, re-evaluate, and reflect more deeply on our understanding of what participants shared. Once we were confident in our shared list of themes and definitions, each researcher returned to the transcripts that she had initially analyzed on her own. Each researcher reviewed the transcripts once more to analyze which additional listed themes could be coded, which existing coded themes needed to be reviewed, and which existing coded themes did not fit anymore. As a note, many of the emergent themes were highly complex with substantial variance in how they were expressed. With this, we lean on the use of quotes and nuanced descriptions to highlight—rather than skim over—variation within themes. All of the listed themes that we identified are included in our presentation and our report.

We also analyzed the artistic component of this research. This analysis was not mutually exclusive from the above process of analyzing climate narratives. Oppositely, many climate narratives were accessed *through* the art. Rather, what this analysis involved was saving picture and video files of all the art that was produced (with consent from participants). We also referred back to the focus group and art studio transcripts to highlight participants' own descriptions of

[4] Each researcher was using the same process of referring to the transcripts, highlighting illustrative quotes, and associating a theme with highlighted quotes. However, each researcher developed these thematic summaries according to their software preferences. Collectively we used a combination of NVivo, Atlas.ti, and highlighting in Microsoft Word.

their art and descriptions of what their art meant to them. Referring to these transcribed descriptions, our research team developed a list of emergent themes. Broadly, these themes captured how participants described the artistic process, what artistic mediums were chosen and why, and how connections to climate and gender were explored through creative expression.

Finally, our research team developed a list of lessons, insights, and feedback regarding the research process itself. This analysis was relatively straightforward, since we were listing lessons that emerged from our own experiences and reflections, as well as from participant survey feedback from the focus group.

4.0 Focus Group Themes

To commence the memory work, the prompt provided to the participants were as follows:

1. Write down a memory about a moment when you first felt connected to climate change in your life.
2. Write down a memory about a moment when you felt that climate change or climate change activism impacted your life.

The participants were asked to recall and write a memory that they were comfortable sharing. They were given the freedom to choose how much detail, information, and context they wanted to provide. From the focus group, we obtained many stories and memories and a few pieces of art as well. From the focus group discussion, we were able to narrow down all these memories into six major themes (Fig.1), and three minor themes (Fig. 2). The major themes (Fig. 1) are numbered, according to the number of participants who spoke about it, with the first theme being the topic touched upon by the majority of our participants.

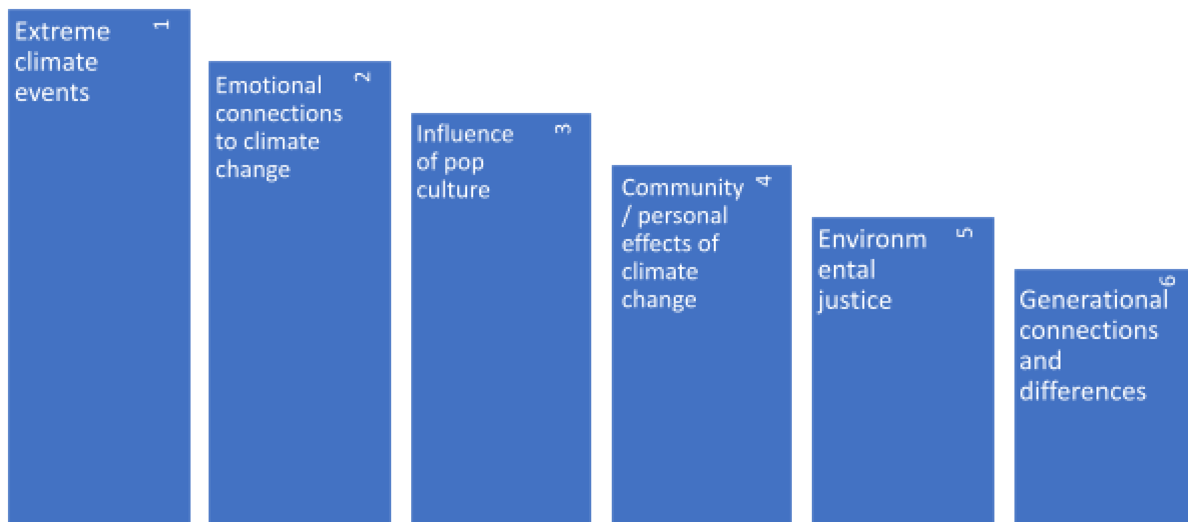

Figure 1 Major themes from the focus group

4.1 Extreme climate events

The IPCC (2018) defines extreme weather or climate events as "the occurrence of a value of a weather or climate variable above or below a threshold value…" Extreme climate events were a prominent memory for the majority of the participants when talking about climate change. Participants recalled their own experiences, the effect of the event on their communities or families, as well as the experience of working with organizations that dealt with such events. The extreme events that people recalled were droughts, floods, wildfires, tsunamis, increased/decreased temperatures and heatwaves.

In the focus group discussion, a participant in her twenties who grew up in Nelson, New Zealand described their recent experience and their mother's experience in the 80s of the Franz Josef Glacier in New Zealand. They said, "*the glacier used to be down the valley, and it has*

retreated quite a bit." They also talk about experiencing warmer summers. The other participant talked about drought and its effect on agriculture. They mentioned:

> *…where I'm from, we're very reliant on agriculture, and we had about three years of pretty dry years… droughts have become more prevalent… and we have had to adjust the way we do it and things like that.*

4.2 Emotional connections to climate change

As part of their memories, participants noted emotions that lent a specific tone to the memories. Some of the emotions, participants associated with climate change were anxiety, sadness, confusion, anger, hope, fear, guilt, loss. Some participants also questioned their feeling of disconnect to the issue. Wang et al. (2018) explain why some people feel more strongly towards some issues than others by substantiating the conceptualization of "caring about climate change," which explains that objects of care such as people, locations that link people to climate change triggers stronger emotions and prompting actions. A participant described such a feeling as:

> *I remember a few years ago, I was a part of this workshop where someone was talking about climate anxiety and climate grief...and how she had been experiencing depression... I remember thinking, that is there something wrong with me that I'm not that emotionally affected…*

Another participant expressed feelings of hope, and they said:

> *I just try to end things on a positive note. This is why my research is in this issue… we should always be talking about it, we should always be trying to fix it. There's really nothing else that's as important right now.*

4.3 Influence of pop culture

The majority of the participants talked about the influence of pop culture on their perception or attitudes toward climate change. Some participants referred to educational

programs, while others talked about how movies have successfully communicated complex environmental problems to the general audience. This participant said, "*when I first thought about climate change, it was when I watched 'An Inconvenient Truth,' which is Al Gore's movie about climate change."* Participants also talked about the strong emotional impact and the motivation to incorporate environmentally friendly practices into their daily life when climate change was communicated using visuals. As this participant said "*I was completely shocked…. and then I stopped eating beef and red meat the next day."* Other participants talked about how the media portrays climate change; they said:

> *We immediately think of climate change as drought or a glacier melting ... And I think that's also what the media portrays; they try to emphasize on pictures such as droughts and disasters, and then I guess we just visualize it that way*

4.4 Community/Personal effects of climate change

When participants shared about their experiences of witnessing changing climate, some memories revolved around the effects on their communities and how communities were contributing to climate change and dealing with climate change. In other cases, participants talked about their observations of their environmental surroundings when they were younger and how they changed over time. Some participants also talked about being able to empathize with others through their experiences. One participant said:

> *For my whole life, it's always been a thing, it's been kind of in the background. And the experiences that I've had are really about more so, the impacts of others, regardless of how close or far away they are from me... It's not really directly impacting me… in terms of what I'm observing, but the experiences of it are more through, like the empathy and the solidarity with other people...*

4.5 Environmental Justice

The Environmental Protection Agency defines environmental justice as “the fair treatment and meaningful involvement of all people regardless of race, color, national origin, or income, concerning the development, implementation, and enforcement of environmental laws, regulations, and policies” (US EPA, 2014). Mary Annaïse Heglar, a climate essayist, asserts that climate change is a product of racism and that its roots back in conquests, genocides, slavery, and colonialism (Cho, 2020). A participant raised a similar point as they explained the importance of conversation on environmental justice through the example of drought in Cape Town; they said:

> *Cape Town is a very segregated city… and a lot of the city's white residents were blaming predominantly the people of color… for wasting water when that wasn't actually the case… [We need to be] thinking about these issues in ways that are not just, thinking about climate change as a natural phenomenon, but thinking about the histories and the politics, and colonialism and things that underlie this issue.*

Kaijser and Kronsell (2014) note that large scale greenhouse gas emissions can be traced back to the unsustainable lifestyle among the world's affluents, in the "developed" regions, while the most exposed and vulnerable facing the most adverse impacts of climate change are the poor, marginalized people living in "low-income areas." Addressing this issue of vulnerability, a participant recalls a time when there was a severe drought in India which led to farmers taking their own lives. During this time, she was also working on a simulation model of the impact of CO_2 levels on crop production in Australia. She said:

> *I thought, why are we not having such simulation models [in India]? Why are we not teaching our farmers that climate change is happening? That's also when I understood that people who have done so little to contribute to climate change are the ones who suffer the most because they are dependent on natural resources, their livelihood is dependent on that.*

Another participant highlighted how disasters only reveal and exacerbate the worst social inequalities; they said:

> *With the LGBTQ people when they experience emergencies and climate change – they don't want to go and get help from a church... because, that's not a welcoming place.*

Similarly, the pandemic has exposed the vast inequalities in health and income across the globe. The head of the World Health Organisation (WHO) has raised questions on the "inequitable distribution" of Covid-19 vaccines worldwide as only 0.1 percent of doses administered worldwide have been in "low-income" countries (Euronews, 2021).

4.6 Generational connections and differences

Wunsch et al. (2013), highlight that the understanding of climate change is a problem for multiple generations. Participants reflected on how the current generation is being affected by the negligence of the past generation regarding the climate and forecasted how the climate crisis caused by this generation would have massive impacts oncoming generations. While talking about such issues, questions on morality and ethics were also raise*d. In the generation of Greta Thunberg and other young climate activists worldwide, participan*ts emphasized how every generation is playing their part in their climate journey. One participant shared her observation on the shift in the attitude towards climate change; they said:

> *New Zealand has this mindset of oh, even with climate change everything will be right in the past and then our generation came through, starting to actually see that we need to actually do something about it.*

Another participant reiterated an idea from Wunsh et al. (2013) that without confronting the problem as an intergenerational one, our ability as humans to mitigate and adapt to climate change will always fall short for the challenges ahead. They pointed out a shortcoming and said: "*.... we're just not having enough conversations across generations as well"*.

The minor themes (1) Evolving understanding of Climate Change, (2) Women's agency, (3) Cultural Differences, and (4) Spillover in memories are further discussed in Appendix 2.

5.0 Art Studio Themes

In order to add another dimension to our research and provide a more nuanced look into our research questions, we held an Artist's Studio which featured three artists. Our motivation for this event was to focus more specifically on how individual artists' express their thoughts and feelings concerning the climate crisis through their artwork. During recruitment for the art studio, we intentionally sought out artists whose work reflected climate and/or environmental issues. Two of the three featured artists are Indigenous to what is now called Canada (Artist One and Artist Two) and the third is first-generation Vietnamese American (Artist Three). The artists' backgrounds and cultures are reflected in their art and was beautifully articulated throughout the art studio discussion. The themes that emerged from the studio were significantly different than the initial focus group. While coding the art studio transcripts using NVivo qualitative analysis software, the major themes that emerged were: Different Ways of Knowing; Relationality; Vulnerability and Social Justice; Using Art as a Way to Process Emotion; Intergenerationality; Culture, Social Practices, and Path Dependency; Different Conceptualizations of Time and Space; Solidarity and Community Through Art; and Hope and Beauty. Minor themes that emerged were Climate Memories and Extreme Weather. There was some overlap in thematic content with several quotes having content that fit into multiple themes.

5.1 Different ways of knowing

"Different Ways of Knowing" was coded 36 different times and thus emerged as the most important theme from the transcripts. This theme spoke to the artists' deep connections to the environment and the unique ways they conveyed this connection when describing their art and the meaning behind it. Indeed, the theme represents alternative ontologies and epistemologies than are represented in western society and academia. Escobar (2018), Whyte (2014), Simpson (2017), and others explore these differences in their work often focusing on Indigenous perspectives that emphasize the inseparability of humans and other living things. This difference in ways of knowing and perceiving the world around us is illuminated in the following quote from a Artist One describing the meaning behind her mural and her its companion storytelling website called "Seeing Through Watcher's Eyes:"

> *I want you to consider that this Indigenous lens that's being offered up for you, to borrow for a short time, wants to talk about all the voices that are not heard as much in Western society, in that environmental science in the universities. For some of us who are of different cultures from around the sacred Earth, our sacred tumilth, I think that sometimes our voices are very much the same.*

Another example of the different ways of knowing can be heard in another quote from the Artist One, explaining how and why she chose the style of language used in her art.

> *I chose to write in… Indigenous English to make it more accessible, but also so our relatives could find themselves in here. And it's how I grew up listening how my grandpa used to speak to me. Most times he would speak in Indian he didn't want to speak in English so much but he would understand when I asked questions. So my ears grew up learning how to move between worlds...*

Later, Artist Two shared that she felt herself learning to slow down and to be intentional through beadwork. She claimed that these lessons are important for finding real solutions to climate change, too:

> *...this is the problem...we all want really fast solutions to these problems. You want a fast fix. That's Western way of thinking. And that's I think how we think right now about climate change, we want to do all this research to have this fixed solution...And if we just all come together to just slow down and place every single thing we do with intention, we'll see actual tactile change like moving forward.*

The three artists' expressed knowledge and worldviews that are different than that of western and dominant academic thought. While Indigenous knowledge and diverse ways of knowing were tied to culture for the artists that shared at the Art Studio, there are many examples of literature that speaks to this different way of knowing for artists compared to other identities. In "Artistic Thinking as Transcognitive Practice: A Reconciliation of the Process-Product Dichotomy," Graeme Sullivan (2001) uses psychology and the science of cognition to explore the different ways that artists think about the world. As the dominant theme that emerged while coding the art studio transcripts, it is evident that different ways of knowing are important in unpacking the ways that diverse artists connect and describe their climate change centered work.

5.2 Relationality

The second most important theme that emerged during analysis was "Relationality." This theme, while related to "Different Ways of Knowing," was sometimes expressed in unique and specific ways, often drawing on Indigenous and intercultural knowledge and the importance of being connected to ancestors, future generations, the environment, and "more than humans" (animals, plants, mountains, and other 'beings'). These concepts and values are expressed in the following quote from Artist One.

> *[showing art] I encourage you to go in… going up to this beautiful tree of life that's here...we have one tiny strip of this beautiful basket that you can see up in this corner here. To get to this basket, it takes a lot of work. So this is myself and my niece, and we're going up to this tree, the tree of life. And we're asking for a*

tiny little bit of its kupu*, its coat. And we go through a lot of a process just to get to being able to cut the pieces apart that's here, those small, tiny bits, and that we end up with a basket once we have cleared our minds and we have worked together.*

5.3 Vulnerability and Social Justice

The third most frequently coded theme that emerged during the process of analyzing the transcripts was "Vulnerability and Social Justice." As has been discussed throughout this paper climate change and other environmental risks disproportionately impact women and communities with less resources or means to adapt or mitigate the effects. Adger (2006), explores the relationship of vulnerability and power, "Vulnerability is driven by inadvertent or deliberate human action that reinforces self-interest and distribution of power in addition to interacting with physical and ecological systems." This theory of vulnerability is a key consideration when thinking about climate change and the different ways it impacts women all over the globe. This theme emerges when Artist Two talked about her work involving Indigenous food systems.

We've lost it in our food chains and the way we think and the way we know. And I really do believe [this loss] is the core of all evil with everything we're seeing around the land right now.

Artist Three spoke about the vulnerability of living with drought in California and how drought impacts people differently in the following quote.

Something that's been on my mind a lot is drought. I think this, the State of California is...once again, approaching another devastating drought. And I work at [a water-related agency]. So, I'm… always thinking about water and always thinking about who does this impact the most? Who are the environmentally…[vulnerable] communities throughout the state that don't have access to safe and affordable drinking water?...

Vulnerability and the different levels of risk that women, communities of color, and those experiencing poverty face create heightened levels of emotion in those experiencing the risks and those that feel connected to the communities most impacted by the risk.

5.4 Using art to process emotions

The next most prominent theme that emerged during coding was "Using Art to Process Emotions." This concept is well documented in academic literature on artistic expression and strong emotions that are present and unpacked when artists create their work (Haeyen 2021, Bentz 2020). In the following quote Artist Two describes how art assists in processing powerful emotions, ranging from feelings of curiosity to feelings of destructiveness:

> *Poetry is the only cathartic experience I can [use] to navigate through those, which is why [in] a lot of my poems I'm very destructive as an individual within them… I'm pushing too hard… I'm stepping too hard to a very consistent theme. And so it's almost as if… I'm working through that in the writing. And when you're writing, if you guys are writers, it's so cathartic… I think the whole point here is that like, approach the darkness, because to approach the darkness allows yourself to route in any reconnection we can have moving forward.*

Many participants through the research process, including Artist Three spoke about trying to navigate how they want to talk about environmental challenges, and how art is helping in that journey:

> *I want to start crying because I'm so emotionally connected to this. And in the workshop that I participated in, I talked a lot about drought, and what was it like ...growing up in California and learning about the drought. I feel like I'm trying to use art and writing as a way to bring more emotion into how I do my work.*

5.5 Connection to past and future generations

The importance of connection to past and future generations also emerged from the transcripts of the art studio and was the fifth most coded theme. One way that Indigenous

Peoples connect to previous and future generations are through creation stories or origin stories that often teach important lessons of how to interact with the world and build a healthy future for the next generations. These lessons can be heard below when Artist Three described her art which centers the Coast Salish creation story of Wild Man and Wild Women.

> *Wild Man and the Wild Woman and they're borrowing you their eyes. So hopefully you could see it a little bit differently. An invitation. I want to acknowledge that in this piece here...the beautiful homes that we have...represented...these relatives and these ancestors have taken such good care that we actually have this here.*

5.6 Other themes

"Culture, Social Practices, and Path Dependency" emerged as a theme less often than the others with 16 incidents. These concepts have been used to demonstrate barriers and limitations in urban planning (Heringa 2018), as well as climate change mitigation and adaptation work (Barnett et. al 2015). In the following quote Artist Two describes being disconnected through the forces of colonization and changing path dependency and her journey of reconnection.

> *Growing up in an urban environment, not on a reserve this disconnect we feel from the land and I think anyone feels disconnected growing up in a city structure, that kind of destructiveness you feel stepping on flowers, not knowing where to throw your food...this destructiveness that… circles, humans, and then at the end… this wishful thinking I wish to… remain and how we can… move forward in reconnecting with the land.*

"Different Conceptualizations of Time and Space" also emerged during analysis, however there was a lot of overlap with the other themes already mentioned, as these different concepts of time and space relate closely to different ways of knowing and relationality.

The last two themes "Solidarity and Community Through Art" and "Hope and Beauty" together were coded 19 times. These themes emerged much stronger throughout the art studio than was expected demonstrating the power and resilience that diverse women and non-binary

folks bring forth through artistic expression. The research team had anticipated that the dominant theme of the group would be related to climate anxiety, however the artists' resilience, strength, and desire to make a positive difference through climate change work resonated throughout their narratives.

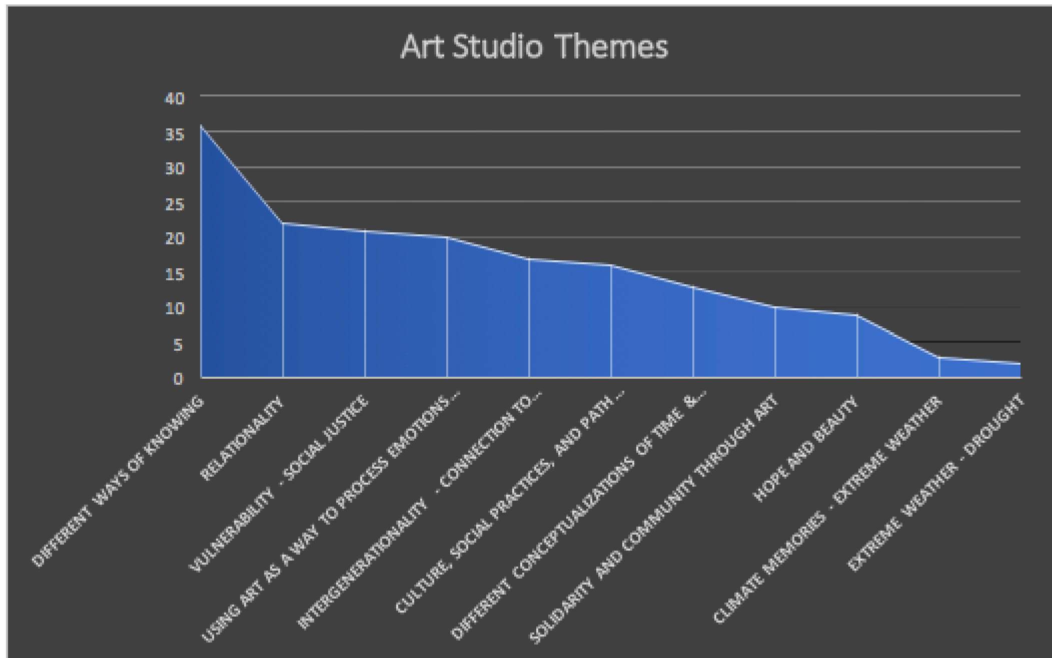

Figure 3 Area Graph of Transcript Themes.

6.0 Theoretical Frameworks and Discussion

This section adopts Clovis' (2011) description of arts-based methodologies as encompassing visual methodologies, performance enquiry, image-based research, installation art, storytelling/memory work, and lyric inquiry. Memory work includes 'collective memory', 'social memory', 'cultural memory' and 'material memory', which refer to the way memory magnetically gathers objects and images to form a pool of knowledge, meanings and symbolism associated with certain groups (Farrelly, 2017; Tolia-Kelly, 2010 & 2016).

6.1 Ecological Solidarity (ES)

The concept of Ecological Solidarity ('ES') in Social Ecological Systems (SES), is a form of collective action on biodiversity conservation grounded in the social and ecological interdependencies, across ecological, socioecological and sociopolitical scales (Mathevet et al, 2016). ES merges normative and scientific dimensions, which supports the traditional notion that "ecology is based on (i) biophysical and functional interactions, and (ii) solidarity among people with a shared goal and a sense of community, who are committed to the common good and wellbeing of the community" (Thompson et al, 2011; Mathevet 2016). Figure 4 portrays the relationality of human and non-human systems within SES.

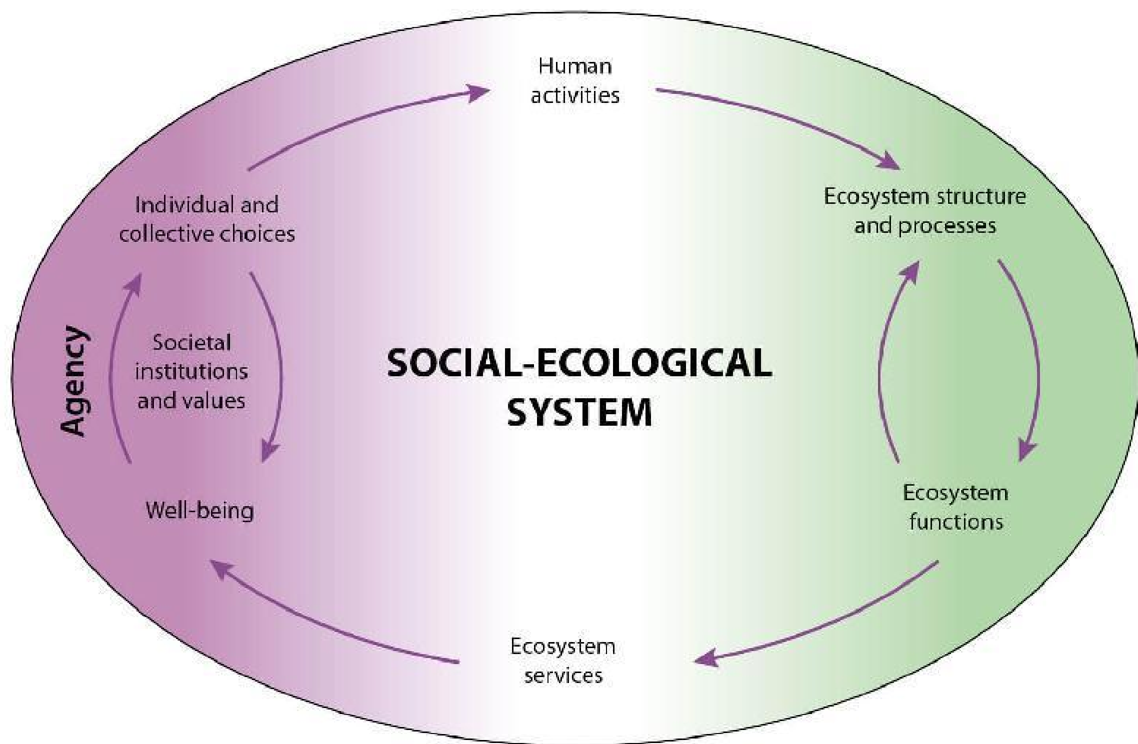

Figure 4 Interdependencies between Human and Non-Human Systems (Carson et al., 2016; Pg. 12).

Arts-based methodologies are a form of agency for ES. According to Cadman et al (2001), collective participatory methods that give women the opportunity to participate in the interpretation of data they help produce, induce solidarity and empowerment that changes both the participants and the world. This underscores the transformational impact of arts-based methodologies across vertical scales[5]. In the focus group, each participant was assigned an individual jam board for expressive writing and enabled to verbally share their story within a breakout group of four to five people. This was followed by group discussions on common themes and interpretations. Fraser & Michell (2015) highlight the horizontal impacts of arts-based methods on social relations, emphasizing that when conducted with respect, memory work fosters trustworthiness and solidarity among participants and researchers. Likewise, Tremblay and Harris (2018) describe the transformative process of arts-based methods on community dynamics, as follows -

> *… as individuals share emotional experiences, their initial sense of anonymity gives way to feelings of community through the development of mutual affection, and coherence of purpose… Pg. 175.*

This underlines the centrality of arts-based methods in defining social values, since feminist participatory methods enable participants to knowingly produce and interpret data, individually and collectively (Onyx and Small, 2001). As participants develop a common understanding of key themes and homogeneity of purpose, common themes on environmental conservation are reinforced as community values and undesirable values are displaced. Figure 5 illustrates the different levels at which social values are created, dispersed and dislodged.

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[5] The term 'vertical scales' refers to interactions between ecological, socioecological and sociopolitical sub-systems, while 'horizontal impacts' occur within the same scale.

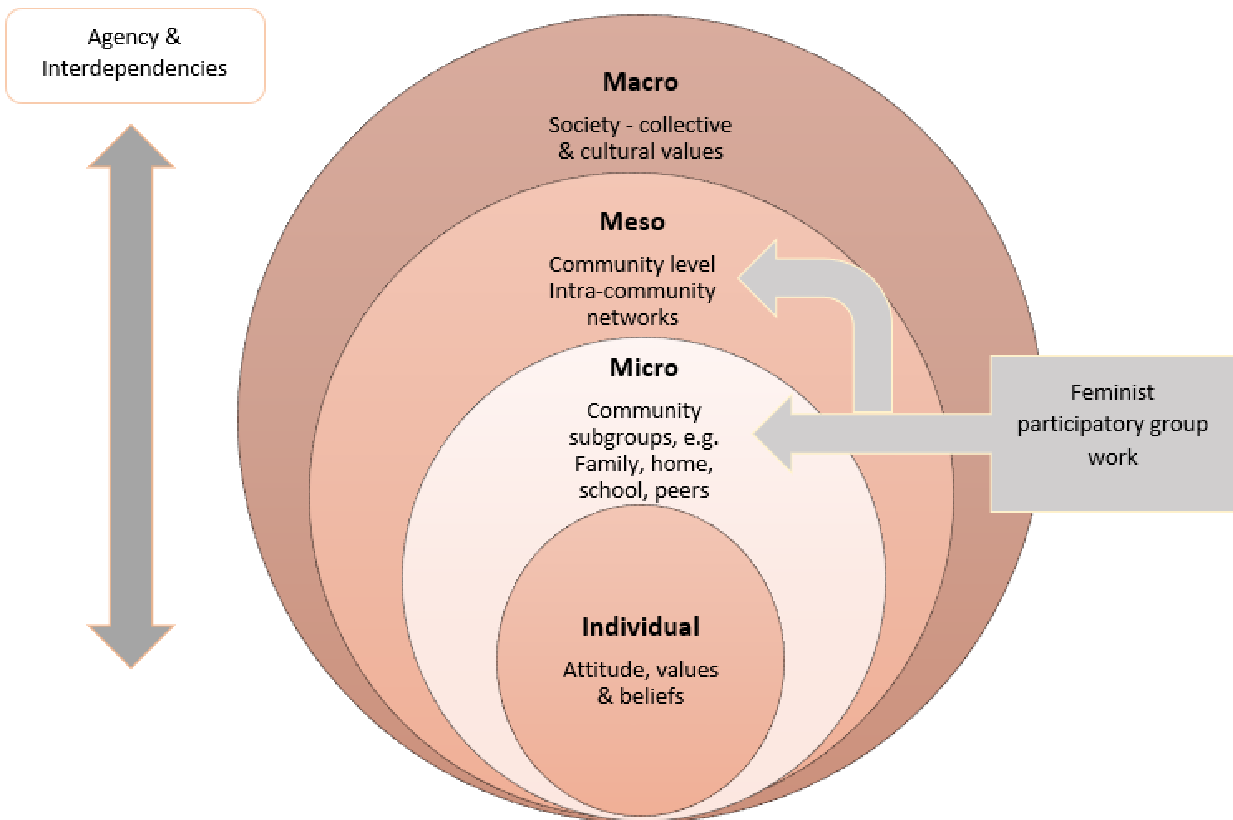

Figure 5 Levels of Social Transfusion of Values & Practices (Developed by researcher based on literature review, 2021).

Collective participatory work occurs at the micro and meso system levels, but is essential to the functioning of SES at all levels. Feelings of community reinforce social cohesion across different scales and stakeholder groups (Ziervogel, 2019), paving way for reciprocal accountability for the sustainable use of resources (Mathevet et al, 2006). Reciprocity enhances the effectiveness of climate strategies, since non-pecuniary motivators influence social behavior (Fehr & Falk, 2002; Cialdini, 2004 and Shultz et al, 2007). Further, solidarity improves ecosystem resilience. When communities unite under a common purpose and build trustworthy relations with other stakeholder groups like environmentalists, scientists and government agencies; both socio-political and socio-ecological systems become more connected and stable,

ushering the system into a state of equilibrium. In contrast, Holling (2001) explains that panarchies begin to collapse within maladaptive cycles due to social disruption and breakdown of cultural cohesion.

6.2 Emotion Work

The intersection of emotion and subjectivity is widely acknowledged in the humanities and social sciences, with emphasis on the linkage between individual emotions and social dynamics (Tremblay & Harris, 2018; Morales & Harris, 2014; Tolia-Kelly, 2010 & 2016). Farrelly (2017) asserts that in order for memory-work to offer a potentially emancipatory and transformative experience, participants must feel nurtured at every stage of the process, which requires engaging in emotion work that is undermined by positivist researchers (Fraser & Michell, 2015). Arts-based methods are therapeutic and appropriate for handling sensitive matters because individual experiences are extended into a social context and away from self (Farrar, 2001). Similarly, memory improves psychological functioning - individuals who engage in expressive writing about their event memories experience fewer subsequent intrusive thoughts, contrary to individuals that do not (Walker et al, 2009).

During the art studio, some participants shared that art helps them to deal with dark emotions, while others referred to it as a medium of hope. However, emotion work often involves navigating sensitive and traumatic experiences. Participants may experience 'involuntary memory rehearsal' of traumatic events when triggered by circumstantial stimulus, e.g. a song (Walker et al, 2009). It is therefore prudent to avoid some topics to safeguard the psychological and emotional wellbeing of participants (Fraser & Michell, 2015). Fraser & Michell recommend that -

Memory work researchers need to be competent group facilitators, willing and able to steer the activities and intervene if group dynamics warrant it …care must also be taken to recruit participants and generate discussions that do not require participants to relive their traumatic experiences in front of a non-therapeutic group. Pg. 325

The research team participated in the memory work, which created trust with other participants, but it was challenging to balance the two roles. Our moderation role included guiding the discussions and giving every participant an opportunity to share their views, as described in more detail under Section 3.

6.3 Inclusivity

Participants acknowledged the importance of arts-based methodologies in mainstreaming the missing voices in climate discourse. From a gender perspective, participants appreciated the open gender framing encompassing all women and non-binary people. Collective memory work was developed in 1987 by Frigga Haug & others, as a feminist methodology to promote gender and sexual equality through the awareness of the socialization process (Haug, 1987; Onyx & Small, 2001; Fraser & Michell, 2016,). It is a form of resistance against colonial structures that elevate the interests of dominant groups over others. Mountz et al (2015) state that –

… we propose collective forms of resistance: strategies to work together to slow scholarship down as part of challenging the growing inequities in higher education. Our central point is that this slowing down represents both a commitment to good scholarship and a feminist politics of resistance to the accelerated timelines of the neoliberal university. Pg. 1238

Addressing social injustices and inequality is vital for ecosystem resilience. Adger (2016) asserts that pre-existing inequalities exacerbate vulnerability, and when faced with extreme climate events, vulnerability can push the system into new domains of reduced resilience. Similarly, arts-based methodologies challenge the traditional perceptions of the term 'expertise'

(Clover, 2011). For the focus group, we relied on autobiographical memory work to better understand participants' perceptions of climate phenomena (Walker et al, 2009). Sharing memories of situatedness consolidates the group's identification with a past, journey, society and heritage (Tolia-Kelly (2010 & 2016). Likewise, Clovis (2011) explored the concept of **'aesthetic identity'** to underscore the symbolism that women attach to their art as a representation of their experiences. Aesthetic identity refers to the cultural alignment of certain artistic genres to certain groups (Roy, 2002).

Recognition of the different forms of expertise validates local knowledge, as everyone is considered an expert on their lived experiences (Haug, 2000; Fraser & Michell, 2015). Edesser (2018) describes 'indigenous knowledge' as -

> *…an additional way of knowing that provides a window into science left primarily outside of the Western canon, but whose branches can be tapped for invaluable resources and deeper insight into the origins and nature of science.*

Figure 6 summarizes the characteristics and intersections between local and scientific knowledge.

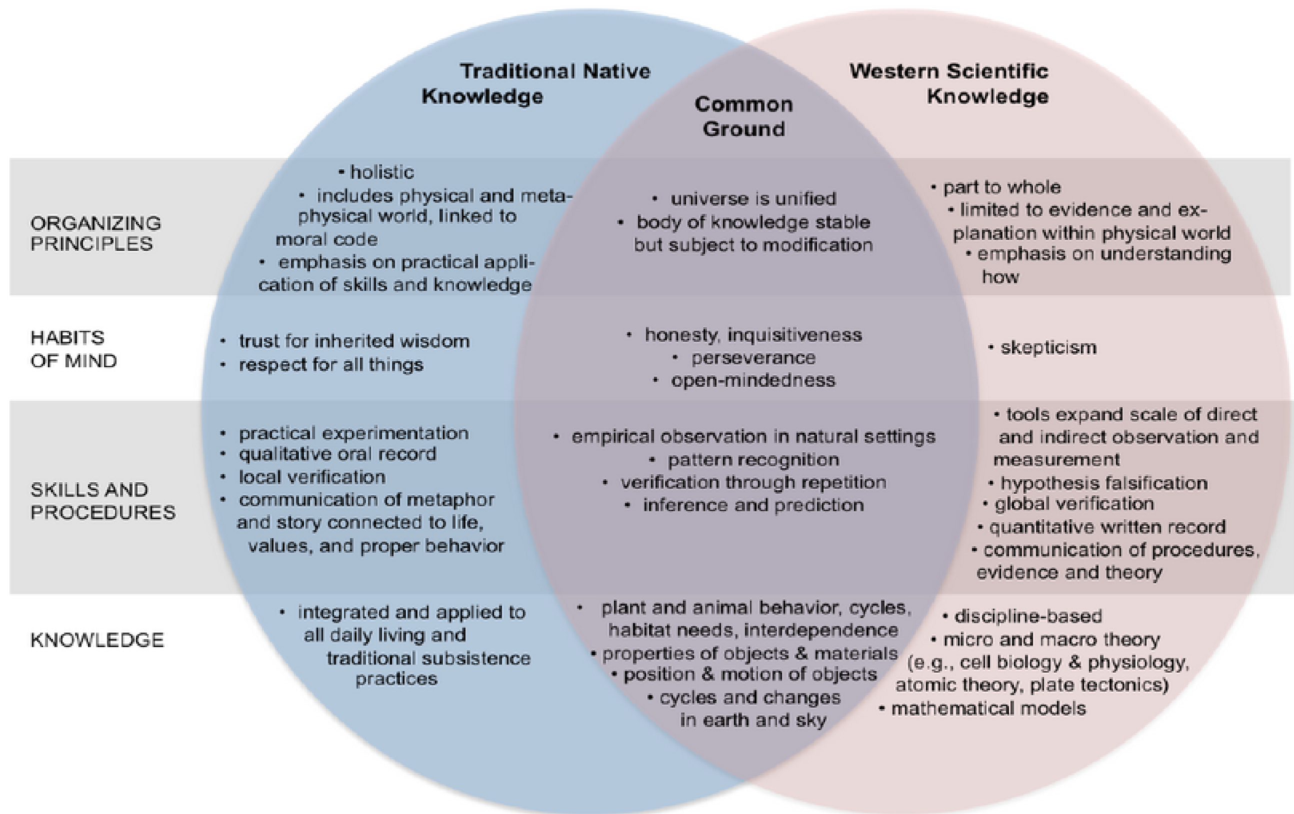

Figure 6 Comparative Summary of Local Knowledge and Scientific Knowledge (Baker, 2016; Pg. 91).

To provide a more holistic picture, arts-based methodologies can be infused in traditional research through 'arts-informed research'. Knowles & Cole (2008) define arts-informed research as -

> *...a mode and form of qualitative research in the social sciences that is influenced by, but not based in, the arts broadly conceived. The central purposes of arts-informed research are to enhance understanding of the human condition through alternative (to conventional) processes and representational forms of inquiry, and to reach multiple audiences by making scholarship more accessible. Pg. 6*

Arts-informed research shifts the dominant paradigmatic view that separates academy and community, to acknowledge the multiple dimensions that constitute the human condition - *physical, emotional, spiritual, social, cultural*, and the diverse ways of engaging in the world - *oral, literal, visual, embodied.* (Knowles & Cole 2008; Schindel et al, 2021).

6.4 Controversies & Limitations

Memory work is criticized for being transitory and subjective to external and internal cues, that affect which memories are recalled and how they are recounted (Conway & Playdell-Pease, 2000). While memory work is key to identity, it is subjective to the political, cultural and social structures, which legitimize or invalidate how certain memories are recounted (Booth, 2008; Fraser & Michell, 2015). Further, memory work runs the risk of reflecting dominant perspectives, because social conventions on how women should think and behave influence their perception on whether certain experiences are ab/normal and how they speak of them (Haug, 2008; Fraser & Michell, 2015). Similarly, socialization of girls in some contexts, draws some women away from engaging in scientific topics (Kaufman, 2000) like climate change.

While affective reactions to heuristic stimuli consciously and subconsciously impact memory (Slovic's, 2007), memory work is also susceptible to repressed memories of traumatic events (Fraser & Michell, 2015). The concept of missing memories has also been framed as "**absence**" - which is a form of agency in memory-work when individuals consciously decide to omit information from their narratives (Farrelly, 2017). Silence is more pronounced when the speaker omits some information from a complex of related information, compared to failure to discuss the event entirely (Walker et al, 2009).

Notably, while macrosocial theorists focus on structure and objective reality through the application of positivist methods, microsocial theorists emphasize agency, through the study of subjective reality, using interpretive methods (Robson, 2013). Memory-workers consider memories as the raw data through which the self and society are constructed, and the

interpretation of which is less about its 'truthfulness' or accuracy, but a representation of past events and how individuals re/construct the events (Crawford et al. 1992). Figure 7 illustrates the differentiated approaches to sociological research.

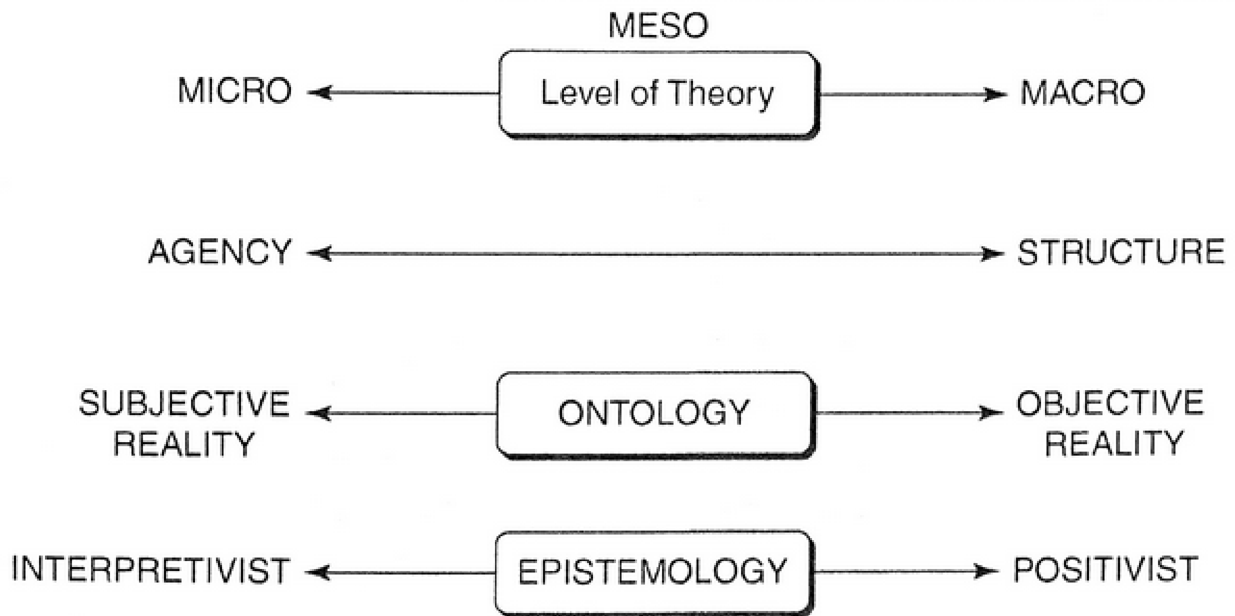

Figure 7 Macro & Micro Approaches to Sociological Research (Robson, 2013).

Accordingly, Farrelly asserts that absence can still be made present and traced through thoughts, emotions, and material objects. Likewise, dominant perspectives can be challenged through increased democratization & memory work - *as people begin to understand how they unconsciously but actively participate in the socialisation process, they are empowered to challenge these normative values* (Fraser & Michell, 2015; Pease, 2000; Heisler, 2008), and adhere to new default rules. The concept of choice and the choice architecture against which individual choices are made, are key in shaping behavior (Shove, 2010; Sustain, 2017). Feminist participatory frameworks transform restrictive choice architecture by creating positive motivators for

pro-environmental conservatism, while disengaging negative barriers (Shove, 2010), as illustrated under Figure 8.

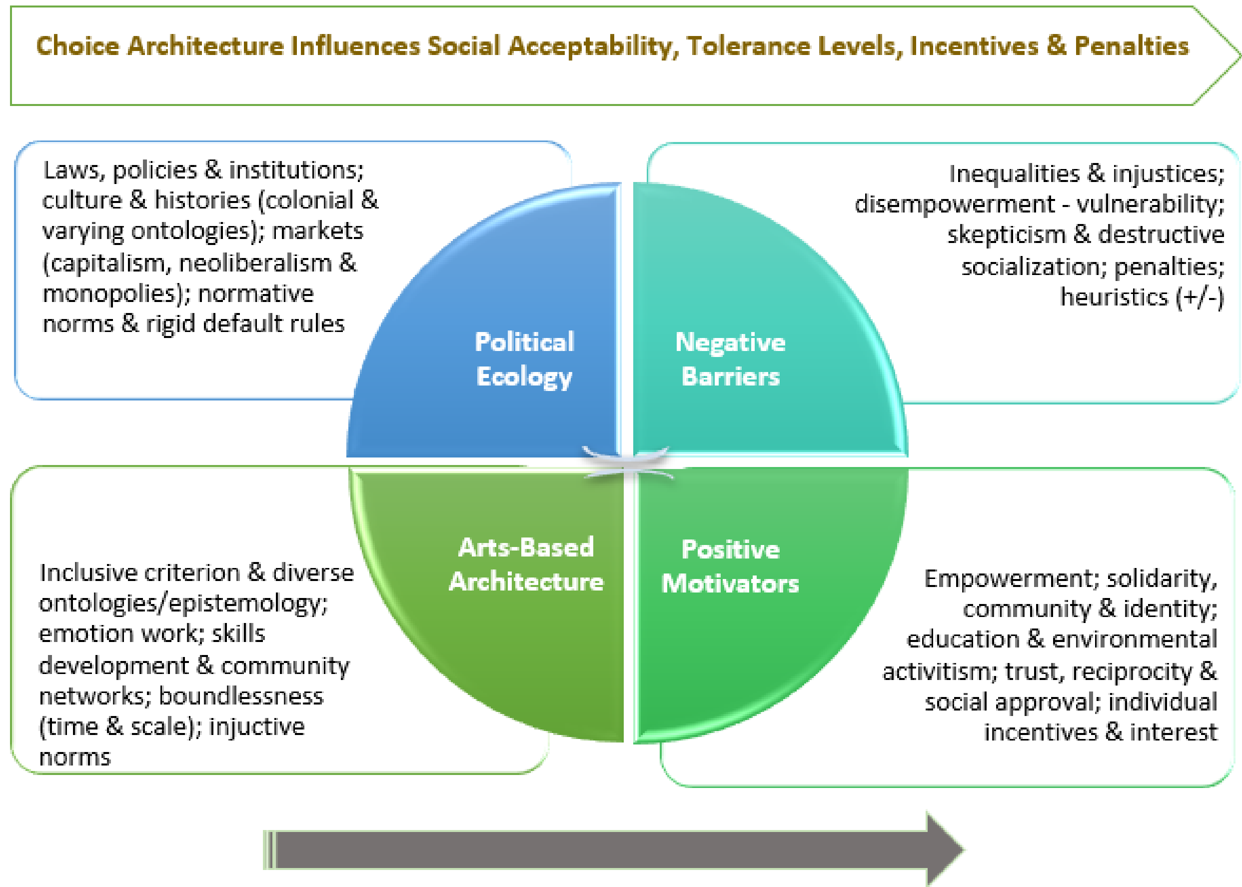

Figure 8 Ecosystem Approach to Pro- Environmental Behavior (Developed by researcher based on literature review, 2021).

6.5 Constraints

Sample Size. Walters (2010) asserts that "*memory work is not designed to reach a lot of people but to provide a more detailed understanding of how small groups experience phenomena*". The project participants are a small subset of a wider group of women. Moreover, each story was very contextualized and may not apply to the narratives of women that did not participate in the project.

Boundlessness & Time Limitations. While arts-based methodologies are construed as a feminist politics of resistance to time and resource constraints *(Farrelly, 2017)*, the project sessions were too short to obtain an in-depth understanding of each participant's context and perspective.

Process Versus Product. To accommodate diversity and emotion work, Lather (1991) recommends a focus on process rather than outputs. Some scholars criticize this approach, contending that unless arts-based methodologies make some form of pedagogical or social contribution, there is a risk of them being viewed as 'art for art's sake', which is a self-indulgent exercise by a privileged few (Eisner, 2008). To address this, many feminist researchers have expanded the justification for arts-based methodologies beyond psychological, to emancipatory objectives (Clovis, 2011).

7.0 Recommendations and Conclusions

This research has explored a few feminist research methodologies, including arts-based and memory work methodologies. While art-based methodologies include visual methodologies, image-based research, installation art-as-research, story-work, and lyric inquiry, the research mainly encompassed image-based research, installation-art-as research, and story-work/memory work. We have adopted a collective participatory approach in conducting a memory work focus group and art studio to explore women's narratives on climate change and agency in the climate response. **Appendix 1 Toolkit for workshop** has included some tips for researchers that seek to employ alternative and art-based research methods in their work. Several recommended steps and tips are included, such as inviting artists and planning ahead for the art studio, suggested sessions' length, leading in discussion, softwares were used and found helpful for the study, such

as otter.ai to transcript from audio to text, and ArcGIS story map to visualize the findings. Based on the research, some of the general recommendations include:

7.1 Mixed Methods

In order to offset the shortcomings of art-based and traditional research methodologies, researchers can incorporate and use diverse research methods. Art-Informed Research seeks to incorporate arts-based methodologies within the traditional research structures. As mentioned earlier in the report, an arts-based method enables the understanding of participants' true feelings and experiences, which is not examined through traditional methodologies. By combining different research designs, the study is able to look at questions from new angles, looking for unexpected findings and/or potential controversies. Further studies need to be done to explore integrated views of linkage between women and climate change.

7.2 Inclusivity

Recruitment of participants requires careful consideration. Snowball or purposive sampling can be useful, particularly for attracting people with less visible or valued identities, such as women from low-socio-economic backgrounds and other minority groups. From our study, the participants are mostly privileged individuals with higher education. It is recommended for future study to improve inclusivity, which means to include more individuals with different education levels, diverse experiences, culture and social background, and religions. Inclusivity will also help to address the inequality and vulnerability problem as mentioned above.

7.3 Visualization

ArcGIS StoryMaps has been created to visualize this study's findings. The StoryMaps includes arts created by attendants and artists, videos of artists explaining their arts and experiences, an interactive game that tells a story of a future climate refugee, and a toolkit for

future study guidance. Visualization enables the audience to understand and experience the findings more quickly, interactively and in an attractive way. Therefore, we would recommend researchers to visualize their results for improved audience experiences.

At the end of both the focus group and the art studio, many participants shared their happiness at having been able to share their stories, find solidarity with others and create and share art. There was an acknowledgement of the rarity of such experiences. Thus, this project is only a beginning, but offers insight into the possibilities of using arts-based methods and memory work in sharing climate change narratives—especially for groups that are disproportionately affected by this looming phenomenon. We learned a great deal from this project—about the power of storytelling in creating communities, and about the symbolic and mobilizing potential of art. We were surprised by the sense of community that developed between the participants and between the group project members in these short periods of time. The level of vulnerability and openness our participants and group members displayed really made this a moving experience for us all. If we were to do another iteration of this project, we would perhaps open it up to the broader public so that we are able to include people from wider socio-economic, educational, racial, gender and sexuality backgrounds. Also, while the story map was an incredibly useful tool, we were limited by the website in the types of content we were able to include in the story map (for example, we were not able to attach a link to a climate change video game a participant had created). However, the story map's capacity to facilitate people's art in an easy-to-access way made it highly compatible with our project goals. We acknowledge the limitations of these methods, but, ultimately, recognize their value in highlighting individual narratives, creating community, and foregrounding the lived experiences and agency of women dealing with climate change around the world.

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Appendix 1: Toolkit for Workshops

Memory work

Memory work comprises "collective memory", "social memory", "cultural memory" and "material memory". These dimensions signify the pool of knowledge and symbolism attached to certain objects and images by a group of people to create meanings. Researchers can adopt different methods to tap into these different forms of knowledge, including narration, lyric inquiry, journaling, autobiography, visual ethnography, among others. In our participatory group work, we utilized the first three methods to navigate the different ways that women become aware of and experience climate change.

Explanation. Memory work allows participants to contribute to knowledge collection and interpretation individually and collectively. During our first focus group event, we divided attendants into groups of 4 to 5 people and encouraged everyone to write down a piece of memory related to climate change. We used journaling to accord each participant with an individual space to document their thoughts and memories prior to the collective discussion.

To provide sufficient scoping and guidance, we requested participants to address two specific aspects, namely:

1. Write down a memory about a moment when you first felt connected to climate change in your life.
2. Write down a memory about a moment when you felt that climate change or climate change activism impacted your life.

It is essential to provide participants with the background of the project and objectives of the workshop. Before commencing with the breakout sessions, we introduced and explained our project to them in the main room and what was expected to come up with the focus group study.

Then, attendants were divided into breakout rooms with 2 group members to lead the discussion. The organizers themselves also participated in the memory work to encourage processes of participatory research and reflexivity and decrease power differentials between participants and organizers.

Sufficient time for attendants to reflect. Art-based methodologies are a form of resistance to time and resource constraints. As we have notified all the attendees beforehand about the focus group's topic, attendants were given 20 minutes for everyone to write down their climate change narratives. If the topics are not notified to participants beforehand or if the need for extra preparation time arises, we recommend giving attendees additional time to respond.

Relaxing environment in sharing. It is crucial to create a relaxing, comforting and encouraging environment for everyone to share their narratives. Some relaxing music was being played during the writing period to make people less stressed. Group members lead the discussion by sharing their narratives and encouraging other attendants to share theirs. By initiating the discussion and responding to attendants' stories, lead members are more likely to create a friendly and welcoming environment.

Arts-based workshop

Inviting Artists. For our workshop, we had the privilege of having three talented artists attended. Before making invitations, it is crucial to decide the event structure and date at an early stage. Therefore, the team will have sufficient time for preparation, and artists can confirm their availability earlier. If an accident happens, confirming the artist's availability as soon as possible and preparing a plan B is crucial. Special consideration should be given to the practicalities of opting for one medium of interaction over another. Our events were conducted during the

COVID-19 pandemic, and therefore, virtual platforms were considered the most feasible way of holding the participatory activities within the prescribed health and safety measures.

Privacy & Confidentiality. Memory work often involves the navigation of sensitive and private stories. In some cases, the sessions involve the recollection of traumatic or raw experiences that require confidentiality. To create a sense of trust and openness, we recommend adopting a privacy policy, including the option for anonymous participation. Consent must be obtained from the participants for the use of any information or materials collected from the process on any other public platform. A sample consent form may be accessed from our ArcGIS Story-map platform under resources.

Encouraging open discussion. For our own experiences, artists and participants have been actively asking and responding to questions. In the case otherwise, it is recommended that group members participate in the discussions and debates to encourage attendants to participate in discussions.

Time. For our focus group and workshop, we received feedback from participants saying that the session could be extended, and they would love to attend more similar sessions like this. The focus group in the workshop are excellent platforms to share experiences and narratives as a woman. Our focus group and workshop were conducted within stringent timelines, and accordingly, both participatory activities lasted one hour and a half (90 minutes), with approximately an hour being dedicated to open discussion. There was hardly sufficient time to delve deeply into each story. Therefore, for future studies, we recommend that sufficient time is dedicated to the process in order to obtain optimum value.

Leading discussion. During the focus group, our lead members actively responded to others and led the discussion. For example, when multiple attendees mentioned their experiences

with extreme weather, group members could identify the theme and encourage further discussion about people's feelings, the reasons behind extreme weather, potential inequality, and the environmental justice problem. In some exceptional circumstances (like a short class project), it may be feasible to merge researcher(s) and participant roles, especially where the researcher has prior experience with moderating collective participatory memory work sessions. Some scholars recommend a separation of the two roles or the appointment of a social worker to support the moderation function to ensure that the discussions are skillfully steered in a manner that takes into account the sensibilities of memory work.

Softwares.

Otter.ai. Audio recording and transcript software are vital to the recollection of narratives. For this study, we used both Zoom and Otter ai. software to transcript the audio and textual engagements. By converting to texts, we are able to analyze common themes, stories, quotes, frequency words, and opinions.

ArcGIS story map. The story map is one of our key deliverables and is a knowledge mobilization/transfer tool. The Story Map showcases anecdotal quotes, artwork, video clips from the focus group and art studio, as well as tips and recommendations to guide future studies. A copy of the toolkit and other resources that we have found useful for art-based research are accessible at the ArcGis platform under Resources.

Appendix 2: Minor Themes from Focus Group

Evolving understandings of climate change

Participants recognized that their understanding of climate change and their surroundings have changed over time. They talked about their climate journey; this participant shared:

> *I built my understanding of climate change from different perspectives, one is, from the natural sciences, which is when I first started learning about climate change… But then, in college, I started learning more about the social implications of climate change, and I became even more interested in it.*

Women's Agency

Huyer and Gumucio (2020) highlight that women's knowledge and networks are a critical component of building resilience; however, little attention is given to enabling their capacity as active agents. Participants also acknowledged how climate adaptation and mitigation strategies might exacerbate gender inequalities. Huyer and Gumicio (2020) also emphasize how, if implemented in a gender-neutral approach, climate adaptation and mitigation may "perpetuate, or, at worst, exacerbate gender inequalities," for example, this could lead to diminishing or diverting the resources to which women have access. They suggest incorporating gender-responsive approaches to promote equality while increasing resilience for all. Lastly participants reiterated the project's main goal of the need to change women's portrayal as victims moving forward. A participant shared how her mother had influenced her role as a woman in climate change:

> *… my earliest memories of the climate movement was when I was about ten years old, and we were living in the Middle East, and my mother is a university professor, and she had started an environmental student group. On the campus, she taught at a time when it was a higher education institution only for men. And she was this, young-ish Indian woman teaching a whole bunch of Arab men. It was, from a gender perspective, a very odd space to navigate. But she started probably the UAE's first environmental student group……. So, I think partly from*

> *that immersive experience, I grew up learning about the issues and certainly following climate politics in that way.*

Cultural Differences

Cultural differences shape people's perceptions of climate change. Weber (2010) explains how people's fundamental values and worldviews influence people's perception and reaction to various phenomena and risks. Similarly, our participants recognized that cultural differences had marked their connection with climate change. They pointed out how their own experiences, backgrounds, and locations reflected their unique view of the climate crisis. A participant reflected:

> *I think it was about how we all have different perspectives. There's a lot of different meanings that we can give to climate change. And maybe even one person can have multiple meanings, about climate change as a concept as a problem as an opportunity, it depends a lot on our context and our previous experiences.*

Spillover of memories

There was a common trend of participants finding it difficult to share just one memory. Instead, participants' memories spilled over into another and formed a storyline. With this, they recognized their growth and connected all the little details in their life that have played a critical role in their climate story. A participant said:

> *I think as an adult, the memory ties back in because whenever winter comes now, and I don't see [as much snow as when I was a kid], it's weird for me, it's almost just feels like a loss of this, tradition, or this loss of this thing that I'm used to that's like, quintessential to growing up in the prairies.*