

**Our Home, Our Food, Our Resilience:  
A Citizen Science Approach using Photovoice to  
Ecological Food Heritage Planning  
with the Kitselas First Nation in Terrace, BC**

by  
**Samantha Leigh Jung**

B.Sc. (Hons., Applied Biology), The University of British Columbia, 2017

Project Submitted in Partial Fulfillment of the  
Requirements for the Degree of  
Master of Resource Management (Planning)

in the  
School of Resource and Environmental Management  
Faculty of Environment

Project No.: 768

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SIMON FRASER UNIVERSITY  
Summer 2021

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**Name:** Samantha Leigh Jung

**Degree:** Master of Resource Management (Planning)

**Project No.:** 768

**Title:** Our Home, Our Food, Our Resilience: A Citizen Science Approach using Photovoice to Ecological Food Heritage Planning with the Kitselas First Nation in Terrace, BC

**Committee:**

**Chair: Nadia Springle**  
MRM Candidate, Resource & Environmental Management

**Tammara Soma**  
Supervisor  
Assistant Professor, Resource & Environmental Management

**Chelsey Geralda Armstrong**  
Committee Member  
Assistant Professor, Indigenous Studies

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## **Abstract**

Community food assessments tend to be limited in their consideration for ecological and cultural assets that are important for food system resiliency. In addition, what are considered assets may not reflect the everyday lived experiences of historically excluded communities. This study applied a citizen science-led photovoice food assessment involving six participants (n=6) who currently live upon the lands of the Kitselas First Nation. Thematic analysis was conducted in NVivo 12 to identify patterns in the citizen scientists' photos and stories as they relate to food security and cultural and ecological food assets. The findings show how Indigenous concepts of relationality and reciprocity are intertwined in cultural and food-related practices, which highlights the need for a holistic approach in planning. Recommendations include Indigenizing the field of planning, centering Indigenous voices, increasing community capacity and food literacy, and implementing Indigenous food considerations in Canadian food policies.

**Keywords:** First Nations; food security; traditional knowledge; food system planning; ecological food assets; photovoice

## **Acknowledgements**

I would like to express my deepest gratitude to Dr. Tammara Soma for her nurturing guidance and immense wisdom about all things related to research and life. Thank you for introducing me to the field of food system planning, where I could pursue two of my greatest interests in my project: photography and storytelling along with community engaged-research.

I also want to thank the Kitselas Lands and Resources department and Dr. Chelsey Geralda Armstrong, for which this project would not have been possible without their permission and support. Thank you to the Kitselas First Nation and the citizen scientists for welcoming me and entrusting me with your stories and lived experiences. I will seek to walk humbly and respectfully through my work, wherever it takes me.

Thank you to Tamara Shulman for the chats about life and for the logistical support that comes with conducting virtual research.

To my family and friends, thank you for your love and support.

All my love to the bestest girl, Tazz, who was there for my major milestones in life and now in spirit. Thank you to Callie, the little peanut, for reminding me there is still a life to live, places to explore, and lessons to learn.

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# Chapter 1. Introduction

## 1.1. Food Systems, Food Security, and Food System Resiliency

A resilient food system – the systems and infrastructures needed for food access, production, processing, distribution, consumption and disposal (Pothukuchi & Kaufman, 2000)– is required to ensure food security and the resiliency of communities. Food systems can also be defined as “socio-ecological systems, formed of biophysical and social factors linked through feedback mechanisms” (Tendall et al., 2015, p. 18). In regard to socio-ecological systems, resilience refers to a system’s ability to adapt and respond to shocks and triggers, acknowledging that nature is inherently unpredictable and requires management options that are adaptable in a regional context (Holling, 1973). Placing resilience in the context of food systems, policy and management interventions requires a holistic system perspective that accounts for complex interactions and their implications (Tendall et al., 2015). As such, Tendall and colleagues (2015) propose that food system resilience be defined as:

The capacity over time of a food system and its units and multiple levels to provide sufficient, appropriate and accessible food to all, in the face of various and even unforeseen disturbances. (Tendall et al, 2015)

The COVID-19 pandemic has shown the world the vulnerability of a commodified and globalized food system that is not resilient and not equipped to respond and adapt to shocks. Food systems were disrupted and led to additional food security challenges for communities , particularly those who are the most vulnerable (High Level of Panel Experts, 2020).

Food security exists when all people, at all times, have physical and economic access to sufficient safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life. (1996 World Food Summit)

In May 2020, almost one in seven Canadians reported they were food insecure, and Canadians living in households with children were more likely to be food insecure. In addition, Canadians who were absent from work due to COVID-19 were almost three times more likely to be food insecure than those who worked (Government of Canada,

2020). The prevalence of household food insecurity differs by racial and cultural groups. According to PROOF (Tarasuk & Mitchell, 2020), being Indigenous means that one is 28.2% more likely to be food insecure, even after taking into account other household characteristics. In addition, the majority of households that experience food insecurity are likely reliant on wages and salaries (65.0%), whereas 14.5% of food insecure households are reliant on social assistance (Tarasuk & Mitchell, 2020), illustrating that food insecurity is widespread amongst those who are in the workforce.

However, the dominant approach to food insecurity and food asset identification is based on a social assistance and charitable food bank structure, which consequently overlooks rich community resources and informal spaces (Miewald & Mccann, 2014; Riches, 2011). As Riches & Tarasuk (2014) note, the foods that are offered at food banks may not always be sufficient, nutritionally balanced, or otherwise adequate. For example, food banks and other non-profit organizations tend to have a selection of food that does not satisfy nutrition standards, is limited in quantity, and/or is inadequate for people with certain medical conditions; ethical, cultural, or religious beliefs; or preferences (Riches, 2011; Riches & Tarasuk, 2014). Due to inadequate social assistance programs in alleviating food insecurity, the Canadian government has framed the right to food as a charitable issue instead of a political and human rights issue (Riches, 2011; Riches & Tarasuk, 2014; Tarasuk et al., 2014).

Other pressures such as industrialization, population levels and environmental impacts from resource extraction and climate change mean that today's food system is susceptible to shocks (Tu et al., 2019), leaving many people around the world food insecure despite there being an abundance and over production of food (Vivero-Pol, 2017). The commodification of food and the lack of acknowledgment of food as vital to socio-cultural relationships has contributed to food wastage and the selling of food for profit instead of for feeding (Manson, 2018; Vivero-Pol, 2017).

In light of this context, it is important for planners and policymakers to identify solutions to promote a more resilient food system. A resilient local food system is one that is not as vulnerable to supply chain shocks (de Zeeuw & Drechsel, 2015). Some scholars have emphasized the importance of investing in a localized food systems as a safeguard against global food disruptions (Blay-Palmer et al., 2012). Alternative food networks (AFNs), those that operate in contradiction to industrial food systems, typically

subsist of locally sourced, small-scale, and/or organically produced food (Poças Ribeiro et al., 2019). To plan for food system resiliency, it is important to have a baseline/community food assessment to better understand the gaps and opportunities in the local food system. Examples of food assessment strategies include food asset mapping (Baker, 2018), empirical assessments to determine factors influencing food insecurity (Deaton et al., 2020), and foodshed assessments to identify geographical sources of food in a given region (Freedgood et al., 2011).

Typically, food asset identifications have used the term *food deserts* to explain the spatialized patterns of injustice associated with food insecurity (De Master & Daniels, 2019; Miewald & Mccann, 2014). The metaphor of a food desert is marginalizing and stigmatizing due to the imagery it conjures – a barren space devoid of noticeable life. In reality, the spaces that a food desert attempts to describe are full of life and may not be lacking healthy food choices. “Focusing on what a community lacks, rather than what resources it has, can have negative psychological impacts, making it harder to solve the problems identified by the assessments” (Freedgood et al., 2011, p. 99). In addition, the term *food desert* has primarily been used to evaluate access to grocery stores and supermarkets, the built infrastructures, which neglects other avenues for accessing food (De Master & Daniels, 2019; Freedgood et al., 2011; Miewald & Mccann, 2014). Many food assessment strategies focus merely on food availability, whereas food systems assessments should encompass the socio-ecological contexts and interactions that are intertwined throughout the food system.

## **1.2. Indigenous Food Security and Food Sovereignty in British Columbia, Canada**

Since time immemorial, First Nations peoples in British Columbia have had intimate and long-standing relationships with the land, forests, oceans and waters, creating vibrant and sustainable food systems. All aspects of life supported a sustainable and safe food system that relied upon hunting, fishing, gathering, growing, preserving, storing, distributing, trading and more (Marchand et al., 2020c; Rural Policy Learning Commons, 2019). Indigenous stories and Indigenous methods of research show that individuals, families and communities in British Columbia were resilient in the event of short-term

and seasonal food shortages because of their connection and respect for their local food system (Morrison, 2020).

Under the notion of *terra nullius*, the *Indian Act*, reserve systems, and ongoing colonial policies have had devastating impacts on Indigenous food systems, food security, health, knowledge sharing, community gathering, and food system resiliency in British Columbia and across Canada (Lam et al., 2019; Morrison, 2020; Randazzo & Robidoux, 2018; Thompson & Thapa, 2019; Wolfe, 2006). Rampant hunger and malnutrition in residential schools contributed to negative generational consequences for child development, growth, and health – by denying the children access to healthy and culturally appropriate food (Fee, 2009). Infants born to women who experienced chronic malnutrition and health ailments are more likely to experience growth failures, insulin resistance and diabetes as children, youth, and young adults (Mosby & Galloway, 2017a). Consequently, stunted development as a result of hunger are seen in the adult grandchildren of residential school survivors (Mosby & Galloway, 2017a). “We were always hungry,” reflected the experience of many residential school survivors (Mosby & Galloway, 2017b).

Through mapping and land designations, the settler-colonial structure and Canadian government have perpetuated harmful views of land as delineable, as expendable, and as devoid of people and culture (Braun, 2002b). “These policies restricted Indigenous peoples from accessing land across Canada, making it increasingly difficult for them to hunt and gather” (Kepkiewicz & Rotz, 2018, p. 15). Industrialization and the commodification of land threaten the food security of First Nations (Armstrong & Brown, 2019). The Skeena River in northern British Columbia is the second-largest salmon-bearing watershed in Canada. Industrial developments, such as natural gas and oil pipelines and terminals and subsequent increased tanker traffic, would devastate many Tsimshian communities’ most food-secure resource, salmon (Armstrong & Brown, 2019). Today, food insecurity in First Nations is about four times higher than the national average across Canada, affecting nearly 50% of First Nations, with many communities relying on the transport of goods from urban centres (Chan et al., 2019).

The question of “whose land?” is an important topic in discussions about food systems and food sovereignty for all communities in Canada – the ability to determine

and make decisions about one's own food system (Kepkiewicz, 2017). A potential first step to understanding the local food context and the resiliency of Indigenous food systems is through community food identification. Food asset identification can help revitalize Indigenous food sovereignty and food security by illuminating the rich contextual knowledge and creation stories that are tied to land as place (Kepkiewicz & Rotz, 2018; Morrison, 2020). Engaging with the settler-colonial structure in Canada and understanding Indigenous perspectives on how land and food are sacred can help reimagine novel pathways to achieving food sovereignty and food security. In order to support efforts toward Indigenous food sovereignty, it is necessary to maintain Indigenous relationships with land, to have Indigenous peoples maintain Indigenous food systems, and to have Indigenous peoples maintain influence over policies at all jurisdictional levels (Kepkiewicz & Dale, 2019).

### **1.3. Research Questions and Objectives**

This study focuses on Indigenous food assets that represent culturally and ecologically important food sources and spaces for communities (Lepofsky et al., 2017). Baker (2018) defines food assets as the local food infrastructure that maintains food-secure communities and regions. Cultural keystone species (e.g., salmon, herring, moose) and cultural keystone places are important elements of Indigenous peoples' "food assets", food security, and community resilience (Garibaldi & Turner, 2004; Lepofsky et al., 2017).

While community food asset assessments can help support efforts towards ensuring food secure communities and regions, without deep community engagement, this process may risk missing important food spaces and practices that reflect the needs, aspirations, and usage of diverse community members (Soma et al., 2021). This study seeks to contribute towards a new approach that can be integrated into food assessment tools, resulting in the identification of critical community food assets, and the contexts behind the assets that support efforts towards securing community food security for the Kitselas First Nation in Terrace, British Columbia.

This study applied a citizen science (Danielsen et al., 2018) and a participatory action research approach (Baum et al., 2006) to using photovoice methodology (Wang &

Burris, 1997) for food asset identification. The study was conducted in partnership with community members that live within the lands of the Kitselas First Nation and some that identify as belonging to other communities, including the Nisga'a, the Metlakatla, the Gitksan, the Gitxa'ala, and the Gitga'ata. The goal of identifying important food-related natural and built infrastructures in the Kitselas community is to help preserve these assets for current and future use by the First Nation, as well as contribute to a growing understanding of what food assets mean to First Nations communities for reconciliation and community planning approaches.

Participatory action research has the potential to reduce the negative and colonizing effects that conventional research has had on Indigenous peoples by employing community members as citizen scientists/researchers in improving community situations (Baum et al., 2006). Consequently, photovoice allows the power to be shifted from the researchers and academics to the citizen scientists, as it is recognized as a participatory action research tool and for its ability to empower citizen scientists and foster social change (Budig et al., 2018; Castleden et al., 2008; Hannay et al., 2013). Utilizing a ground-up approach that is needs- and strengths-based and Nation-determined allows citizen scientists to direct what knowledge will be utilized in their community and in publications. Photovoice research combines photography and interviews/storytelling based on the photos taken by the citizen scientists. The use of photovoice in providing more context may enable a more equitable and innovative approach to Indigenous food asset identification (Castleden et al., 2008).

The study aimed to answer the following research questions:

1. How can a citizen science process led by Indigenous peoples better identify food assets, which have thus far been relatively overlooked in a Western food security framework;
2. How can identifying Indigenous food assets better inform the field of food systems planning and food-related policy making; and
3. How can the integration of novel photovoice methodology improve the efficacy of food asset identification in terms of food security and food resiliency?

This study explored three inter-related themes from practice theory (Shove & Pantzar, 2005) as it pertains to food:

1. Material (built environment, nature, places and spaces, infrastructures that are key to supporting food access and food security);
2. Meaning (the emotions and identity around food, food access, food culture both past and present, hopes and aspirations as it pertains to food); and
3. Competence (skills and learning around food).

The approach of conducting a citizen science research allows a decentralization of power from planners and policymakers to citizen scientists. Treating Indigenous knowledge holders as experts can improve a collective understanding of both the tangible and the metaphysical, the spiritual and non-tangible, and the interconnected relationships that shape local Indigenous food security (Rose, 2005).

Findings from this study identified the importance of traditional knowledge in identifying natural food assets, the importance of understanding how climate and seasonal change affect harvesting and foraging, and the role that community and family education and learning play in passing on cultural knowledge as it pertains to food and health. Ecologically, some of these natural assets and culturally important sites have been shown to increase the activity of animals and pollinators seeking food while conferring extended ecosystem functions to non-humans as well (Armstrong, 2017; Lepofsky et al., 2017). By including culturally important landscapes in community food asset identification, the findings from this study will offer a novel and important contribution, not only for planning more food secure communities, but also towards the biological and heritage conservation of important cultural-ecological places. Including natural and culturally important food infrastructure will expand the definition of food assets and support more just and encompassing food security strategies. Indigenous knowledge cannot be taught in a book or in a classroom. To truly protect this knowledge, the lands from which this knowledge is born must be protected (Simpson, 2004). Collaborative, community-engaged, and Nation-led research to identify and preserve these assets can be one step toward reconciliation and decolonization.

As an interdisciplinary study, this work will also help bridge the Western fields of natural science and social science with local Indigenous knowledge. This research is novel as it will be the first to contribute to an Indigenous focused photovoice food asset study in

British Columbia and fills an important knowledge gap on First Nation's aspirations for their food system upon the lands of the Kitselas First Nation. This study also contributes to a new area of research around ecological and food heritage planning, resulting in a better understanding of infrastructural (both formal and informal, natural and built), cultural, and spiritual food assets, and improved policies to ensure food system resiliency in British Columbia. In addition, this study is part of a larger food asset mapping project being conducted by the Food Systems Lab<sup>1</sup>.

The following chapter (Chapter 2) is a literature review that explores part of the colonial history of Canada and the impacts these events had and still have on food security and food sovereignty for Indigenous peoples in Canada. Chapter 3 focuses on the methodology and limitations of this study. Chapter 4 outlines the key findings as well as the discussion of these findings. Chapter 5 concludes the paper with recommendations and conclusions.

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<sup>1</sup> **Food Systems Lab:** *The Food Systems Lab is a research and innovation hub at Simon Fraser University that works on solutions for equitable collaboration to reduce food waste and support a sustainable food system that enhances ecosystems, conserves natural resources, and mitigates climate change. [www.foodsystemslab.ca](http://www.foodsystemslab.ca)*



## Chapter 2. Literature Review

### 2.1. Kitselas First Nation

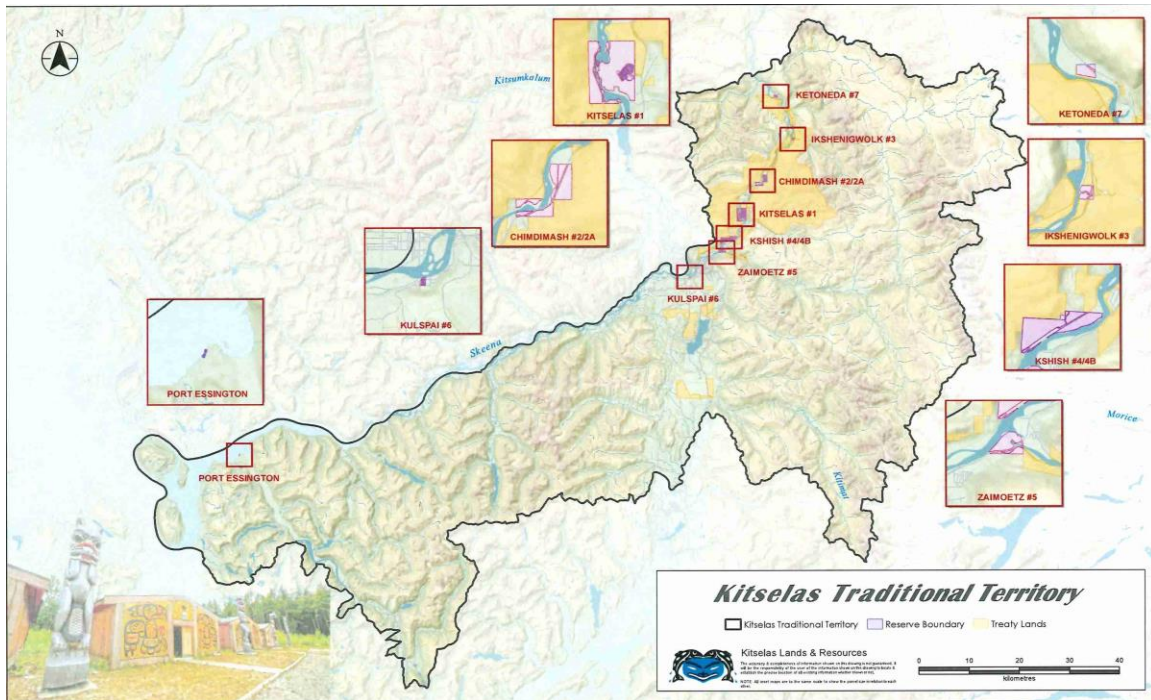


Figure 1 Map of the Kitselas traditional territory

Source: [www.kitselas.com](http://www.kitselas.com)

This study was situated upon the traditional territory of the Kitselas First Nation in Northwestern British Columbia, surrounding the City of Terrace and the Skeena River. The Kitselas are part of the Tsimshian (Tsym'sen) Indigenous peoples, meaning “inside the Skeena River”. Today, the Kitselas’ population is approximately 700 people living on either the Gitau reserve or the Kulspai reserve, or living elsewhere throughout British Columbia and other places.

Archaeological and ethnographic evidence suggests people have inhabited the Kitselas Canyon area for at least 5,000 years, and these numbers were confirmed by Kitselas elders. Kitselas, or Gitselasu means ‘people of the Canyon’ in the Tsimshian language of Sm’algyax. The Kitselas Canyon, the North Coast, and the lower Nass River systems are important to the Kitselas people as a base of natural resources and cultural

traditions, as well as for economy. There are four main clans that make up the Kitselas: Gispudwada (Killer whale), Laxgiboo (Wolf), Laxsgiik (Eagle), and Ganhada (Raven). The Kitselas people have several creation and cultural stories (the *adawx*) that detail from a Tsimshian perspective how the lands were formed, how their people came to live upon and learn from the land, and how the main clans came to be (Kitselas First Nation, 2021).

The Kitselas people thrived pre-contact. An excerpt from a speech made by Chief Samuel Wise of the Kitselas Tribe on September 5<sup>th</sup>, 1915 alludes to the hardships experienced during early colonization, and the empty promises made by the Canadian government indicating that the Kitselas people could maintain their sovereignty (Kitselas First Nation, 2021). Currently, the Kitselas is one of 14 Tsimshian tribes in British Columbia. However, the Kitselas have undergone several negotiations over the years and still, to this day, do not have a Final Agreement or Treaty (TFN Treaty Society, 2021).

## **2.2. Planning as a Colonial Tool**

With origins from European epistemologies and Christian religion, early colonialism in Canada functioned off the *Doctrine of Discovery*, a notion first professed by Pope Eugenius IV in 1436, which articulated Christian entitlement to 'discovered' lands and provided the directive to bring 'others,' the 'uncivilized,' into the Christian order (Flowers, 2015). To gain power and control, European settlers relied on a colonial system, one that is built upon power structures, dominance, and categorization. The idea was to extend control of the European empire by establishing colonies on other lands in order to exploit resources. The European invasion of Canada resulted in cultural genocide and assimilation of Indigenous peoples with the goal of furthering the image of the Christian European and Western systems of thought.

The act of 'planning' has been a complicit force in laying the roots of and solidifying settler-colonial systems in Canada (Ugarte, 2014). However, planning in itself is not a foreign concept to Indigenous peoples. Wherever there is a gathering of people, there is a need for planning to help build a collective sense of purpose and community direction for the future (Mannell et al., 2013; Matunga, 2013). Just like Western planning,

Indigenous planning is future-oriented and grounded in traditions from the past. It is centered on specific places, experiences, and lands, with a focus on both community development and spatial planning (Walker & Matunga, 2013). Upon colonization, European Settlers used tools and practices that can be recognized as belonging to the field of planning to exhibit control over the Indigenous peoples and their lands through dispossession, re-classification, erasure, and imposed systems; thus, hindering the ability of numerous Indigenous peoples' to plan for their communities:

What most planners were not taught in school is that planning has been an apparatus of colonization in Canada and much of the New World. Every parcel of land in our country belonged to Indigenous people at one point. After colonization, Indigenous peoples were placed on reserves where familiar planning tools were [mis]used for their subjugation. On top of this, the profession denied the existence of an ancient Indigenous planning tradition. The political, legal and bureaucratic exercises of power were based in a racist and paternalistic attitude: that "I"—the non-native, expert planner know better than "you"—and should therefore be in charge (Herfan and Hemphill, 2013 p. 18).

As Patrick Wolfe emphasizes, settler colonialism is understood as a "structure rather than an event" that dispossess Indigenous peoples of their lands, cultures, and bodies (Wolfe, 2006, p. 390). Western planning is situated within democratic values such as objectivity, the interest of the majority, and responsibility to the people. Consequently, Western planning perpetuated and solidified the legitimacy of the Settler-colonial structure by employing tools that shape the planning practice as it is recognized today. In an attempt to create a unified vision for the future, Western planning practice had and still has neglected the worldviews and histories of the Indigenous peoples in Canada, contributing to their attempted erasure and assimilation into colonial society.

Much of the planning profession operates around the appeasement of the general public, or the public interest (Grant, 2005; Nagy, 2015). The identity of and the definition of the public interest is ever-changing because it is dependent on context, public perception, and the acceptance of societal norms. One interpretation of the origins of the public interest is that it arose to address the need for a more publicly-informed way of creating policy (Klosterman, 2016, p.9). Fainstein and DeFilippis (2016) believe the public interest to be based upon a set of key values: equal protection and equal opportunity, public space, and a sense of civic community and social responsibility (p. 10). In a similar vein, the idea of the public interest and the pursuit for the 'public good' can present many opportunities for achieving notions of equality; however, this means

planners need to worry about championing social justice while balancing efficiency with the hopes of achieving decent outcomes (Forester, 1989, p. 4).

It can also be argued that the concept of the public interest legitimizes the power of the colonial state (Grant, 2005; Lennon, 2017), furthering the goals of those that align with the government's objectives. Ultimately, it is the government that decides the political process for engagement and what interests will be considered important. However, these decisions can be swayed and upended by people with large amounts of wealth, loud voices, and privilege, ensuring the government acts in their interest (Klosterman, 2016, p. 4). Events in Canadian history and current events and policies can help illustrate the use of the public interest by the Canadian government to seize Indigenous lands and eliminate Indigenous peoples and Indigenous ways of life. Historic treaties that were drawn between Indigenous leaders and colonial settlers were a form of international law that constituted nation-to-nation agreements. However, the courts interpreted the treaties as "devices of the state" that are formally acknowledged, but not as legally enforceable nation-to-nation agreements (Jacobs, 2010, p. 2). Characterizing Indigenous peoples as the 'other' sets the stage for the government to continue its colonial claim and to seize Indigenous lands in the public interest of Canada. The *British North America Act of 1867* gave the colonial government unilateral powers to control 'Indians and lands reserved for Indians' under section 91(24). In addition, the *Indian Act* advanced the social and cultural genocide of Indigenous peoples through racialization, categorization, and forced assimilation via residential schools, Indian status, and the creation of reserves. All of these systematic harms inflicted upon Indigenous peoples can be traced back to the colonial government's need to acquire land (Tuck & Yang, 2012).

On February 21 2020, Prime Minister Justin Trudeau made a speech regarding the Wet'suwet'en rail blockades (CTV News, 2020), from which key insights can be gleaned concerning who the government considers to be part of the Canadian public interest:

Canadians have been patient. Our government has been patient. But it has been two weeks, and the barricades need to come down now.

Every attempt at dialogue has been made. The discussions have not been productive. We cannot have dialogue when only one party is coming to the table. We have no choice but to stop making the same overtures.

There is a relationship [with Indigenous peoples] to be renewed, and new relationships to be built. Canada is ready for this. Canadians want this. But hurting Canadian families from coast-to-coast-to-coast does nothing to advance the cause of reconciliation. (CTV News, 2020)

Looking at past history and present day attitudes, Indigenous peoples have never been considered part of the Canadian public interest and have consequently had their interests intentionally disregarded. Prime Minister Trudeau's speech further solidified the government's view of Indigenous peoples as the 'other' and as peoples whose rights can be attacked via planning and legal processes.

### **2.3. Impacts of Canadian Colonial Policies on Indigenous Knowledge Translation and Food Security**

Canada has a history and current policy that was enacted for cultural genocide with the goals of assimilating Aboriginal peoples and divesting itself of legal and financial obligations to Aboriginal peoples whilst gaining control over their lands and resources (Truth and Reconciliation Commission of Canada, 2015). The Canadian government's Aboriginal policy and ongoing colonialism continue to contribute to the attempted erasure of Indigenous land-based knowledge and wisdom (Armstrong et al., 2018), leading to poor health outcomes and lack of food security for many Aboriginal communities (Mosby, 2013; Skinner et al., 2013; Truth and Reconciliation Commission of Canada, 2015). The assimilation policy has created a several decades gap in traditional knowledge related to food security for many First Nations communities, as well as contributed to inter-generational trauma and residual poor health outcomes for many First Nations peoples (Chan et al., 2019; Mosby, 2013; Mosby & Galloway, 2017b; Schuster et al., 2011). However, it could be argued that First Nations peoples also found ways to maintain their cultural resilience through practice of traditions and through adaptation (Douglas et al., 2014).

#### **2.3.1. The Indian Act**

In 1876, the *Indian Act* (R.S.C., 1985, c I-5) was passed. The *Indian Act* sought to directly attack Indigenous knowledge and Indigenous nationhood through cultural annihilation and assimilation into mainstream Canadian society (Simpson, 2004). Under

the terms of the *Indian Act*, all First Nations lands are held by the Crown in trust for a First Nation, meaning all governance decisions are processed and decided by the Canadian government instead of the First Nation that resides on the land.

The government differentiated between Canadians and 'Indians' by assigning status. Through this system, the government imposed patriarchal structures that employed differences in how men and women acquired or lost status, which has implications for the reception of potential benefits and rights from the government. The government also decides with whom they will communicate with or recognize as Indigenous leadership by controlling the selection of band councils. In addition, the government banned the potlatch from 1885 to 1951 (*Indian Act*, R.S.C., 1985, c I-5). The potlatch is an oral ceremony that is vital for Indigenous forms of governance that includes conveying knowledge, "property", and hereditary titles. Because the potlatch and story sharing was banned, there was a gap in oral history and Indigenous forms of planning that hindered Indigenous peoples' ability to protect their cultures and their lands (O'Neil et al., 2016). Not only were Indigenous peoples banned from their own planning practices, they were also banned from colonial forms of planning such as making land claims or hiring lawyers from 1927 to 1951 (*Indian Act*, (R.S.C., 1985, c I-5).

The lands that the federal government allocated as reserves for Indigenous peoples tend to be on intentionally marginal lands in rural areas (resource-poor lands), with undesirable infrastructure such as waste treatment plants or railways placed within the communities (Raibmon, 2018). The deliberate settlement of Indigenous peoples in this manner could also be thought of as environmental racism and constitutes an important policy problem that is often neglected (Dhillon & Young, 2010; Raibmon, 2018). "The concept of environmental racism is rights-based and asserts the communities subject to this kind of racism are frequently impoverished, excluded from dominant cultures and are denied full citizenship" (Dhillon and Young, 2010, p. 24). The *Canadian Environmental Protection Act* (S.C. 1999, c. 33) claims to protect human life from toxic hazards, but it does not explicitly mandate equal opportunity of protection to all peoples (Dhillon & Young, 2010). Through Indian status classifications, the banning of Indigenous cultural traditions, and the placement of reserves on marginal lands, Indigenous peoples were categorized as sub-human and their way of life was deemed to not be part of the Canadian public interest.

### **2.3.2. Residential Schools and Day Schools**

With Indigenous planning practices suppressed, the government sought to remove the “Indian problem” to serve the Settler public interest by sending Indigenous children to residential schools and day schools. With adults and Elders barred from practicing Indigenous governance systems and from participating in colonial planning practices, and with children being forced to assimilate into European-Canadian culture, there was a several generational disruption to the ability for Indigenous peoples to plan for their communities and ensure their own intergenerational food security (Mannell et al., 2013).

The boarding schools were poorly furnished, abysmally equipped to house people, and were inadequately maintained (Truth and Reconciliation Commission of Canada, 2015). Based upon the notion that European culture and civilization was superior, Aboriginal children were treated as if they were savages. The schools were established to “kill the Indian in the child” through the separation of children from their families, culture, and identity. The schools were pivotal in the cultural genocide of Indigenous peoples, including their food system and food-related ceremonies. Indigenous children were taught to not trust their Elders or to speak their own language, and traditional clothing was exchanged for “civilized” attire (Cote, 2010, p. 50).

Upon entering the schools, First Nations children and youth were healthy with normal body mass indices and low rates of obesity and type 2 diabetes, showing that First Nations children were typically healthier than non-First Nations children of similar age (Hackett et al., 2016). Data was collected upon the entry of First Nations children into the residential school system, reflecting the general nutritional conditions of children in their home communities rather than the nutritional impact from being in residential schools (Hackett et al., 2016).

Between 1942 and 1952, “nutritional experiments” were conducted by leading experts in cooperation with the Canadian government upon Aboriginal children at residential schools to transition students from “traditional” diet to “modern” foodways, among other reasons (Mosby, 2013). In 1942, the federal government issued Canada’s Official Food Rules, which was an earlier version of the Canada Food Guide. Inspectors founds that residential school diets did not meet the guidelines set by the Food Rules (Truth and Reconciliation Commission of Canada, 2015). Students reportedly made

efforts to secretly improve their diets by raiding food cellars, venturing off of the school grounds, and sneaking bites of food during meal preparation times. School staff were often observed enjoying better fare than the students, highlighting the intentional disparity in nutritional standards for Aboriginal children (Fee, 2009). The combination of inadequate funding from the Canadian government, lack of access to traditional and nutritious foods and medicines, and the ongoing assimilation and experimentation resulted in poor nutrition and health outcomes for Aboriginal children that attended residential schools (Mosby, 2013). Day schools functioned in a similar fashion as residential schools. The schools were a breeding ground for disease and contributed to notable health crises such as the spread of tuberculosis. The atrocities conducted upon Aboriginal children at residential schools stemmed from racism and the false notion that Aboriginal peoples had to be guided from primitivity toward modernity (Braun, 2002b; Mosby, 2013; Perley, 2019).

### **2.3.3. Modern Treaties and Comprehensive Land Claims**

Under the Canadian legal system, Indigenous peoples are claiming ownership of their unceded and ancestral lands. The modern treaty process primarily affects First Nations in British Columbia because many historical treaties were not concluded. However, the federal government of Canada decides the rules for how the land claim process proceeds and how Indigeneity is classified. Land claims are used in an attempt to resolve the colonial past by deciding Indigenous territorial boundaries and disputes through a colonial system of land rights and title (Altamirano-Jimenez, 2013; Tuck & Yang, 2012). Through this system, Indigenous peoples are made to prove continuity of “traditional practices” on the land prior to 1867, or pre-contact. Altamirano-Jimenez (2013) argues that this condition lends support to Indigenous practices that are deemed by the government to be far-removed from “civilization,” degrading Indigenous culture to merely subsistence practices that perpetuate the stereotype of the ecological Indian and the classification of Indigenous lands as “pristine wilderness” or natural resources. Building upon Braun’s argument regarding the “primitive” versus the “modern Native” discussed previously, the freezing of Indigenous practices to those conducted before 1867 disallows the ability for Indigenous peoples to adapt to changing society or to evolve their worldviews. “By removing signs of the *modern* Native culture from the landscape, the same rhetorical maneuvers that enabled the region to be seen as a



resource landscape in the first place are again deployed” (Braun, 2002b, p. 96). Since 1973, more than 100 Indigenous groups have begun negotiating land claims and rights to self-government throughout Canada, and at least 26 of these treaties have been ratified to-date (Government of Canada, 2015), illustrating how long and drawn-out the process is. These constitutionally protected, mutually binding, government-to-government agreements will change how planning is conducted due to the recognition of Indigenous sovereignty and decision-making powers.

The settler-colonial structure in Canada has actively separated Indigenous peoples from their cultural and governance systems. This has contributed to a deficit state where Indigenous peoples and their communities operate and govern from a permanently marginalized position. “Under neoliberal governance, there is no issue of a dichotomy between individual and collective rights or between cultural and material local needs. Rather, the issue is how Indigenous laws, relationships, place, and gender are reframed to serve capitalist growth” (Altamirano-Jimenez, 2013, p. 87). Consequently, self-determination has been constructed as a conditional right bestowed by the state upon Indigenous peoples that separates the links between culture and land, instead of as a holistic, community-based process that has always existed (Corntassel & Bryce, 2012).

## **2.4. Indigenous Food Security and Food Sovereignty**

Contrary to colonial thinking of individuality, ownership, and commodification, a foundational concept in Indigenous ontologies is the ideal of relationality and reciprocity (Kepkiewicz & Dale, 2019; Manson, 2018; Nadasdy, 2005; Tuck & Yang, 2012). Relationality is the recognition that Indigenous peoples are members of a broad community of beings to whom they are related (Nadasdy, 2005). The *giving* of food creates relationships that are attached to reciprocal responsibilities; whereas, colonial, liberal legality orders the idea that self-owning individuals are entitled to the fruits of their labour (Braun, 2002c; Manson, 2018). The colonial identification of food as resources ignores the ideals and promotion of trust and respect for life which are core concepts in many Indigenous worldviews (Salomon et al., 2018). Traditional food holds multiple values for First Nations. These include cultural, spiritual, and traditional values, along

with enhanced nutrition and health, food security, ways of knowing, and an ongoing connection to land and water (Chan et al., 2019).

For example, the Cree of the western and eastern James Bay region hold subsistence harvesting as integral for cultural and social cohesiveness (Skinner et al., 2013). Manitoba First Nations communities thrived on a predominately subsistence-based economy by harvesting foods such as mammals, fish, plants, berries and waterfowl/seabirds from local stocks (Fieldhouse & Thompson, 2012). Hunters from the Kluane First Nation hold a respect for “the environment” that can only be approximated by English terms as awareness for the perils the weather and animals can inflict upon humans (Nadasdy, 2005). Practices, beliefs, and knowledge such as family-specific hunting territories, seasonally variable strategies in hunting and fishing, and food preparation practices are passed down and embedded through oral stories and cultural customs (Nadasdy, 2005). For the Ahousaht and Namgis peoples, salmon fishing and whaling are intertwined with the fates of their peoples beyond a form of subsistence as these practices are also a means of social practice and knowledge translation (Schreiber, 2002). Being able to harvest, share, and consume traditional foods is recognized as important to the food and cultural security of Indigenous peoples (Fieldhouse & Thompson, 2012).

According to Kepkiewicz and Dale (2019), Indigenous food sovereignty is based upon four principles:

1. The necessity of maintaining Indigenous relationships with land;
2. The ongoing work of Indigenous peoples in shaping healthy and culturally appropriate food systems;
3. The daily maintenance of Indigenous food systems by Indigenous peoples; and
4. The need for Indigenous influence over policies at all jurisdictional levels.

Over the last 70 years, there has been a shift from hunting, fishing, gathering, and traditional agriculture to purchasing foods from stores and the global market (Fieldhouse & Thompson, 2012). Many First Nations face the challenge of extremely high rates of food insecurity (Chan et al., 2019). First Nations communities are frequently economically marginalized through Canadian government policies and inaction, and commonly lack adequate food-related infrastructures for processing, production, and transport (Fieldhouse & Thompson, 2012; Leibovitch Randazzo & Robidoux, 2019).

Overall, almost half of all First Nation families have difficulty putting enough food on the table. Families with children are affected to an even greater degree. The costs of hunting and practicing traditional gathering methods has also become more expensive and a barrier to accessing traditional food supplies (Douglas et al., 2014). Older methods of food handling and preservation are also declining due to high cost and a lack of Elders that hold the traditional knowledge and stories (Douglas et al., 2014). The youth are seen as integral to continuing the traditional ways yet are commonly seen losing their ties to food traditions (Douglas et al., 2014; Sloan Morgan, 2020).

The current diet of many First Nation adults is nutritionally inadequate, which is strongly tied to food insecurity and limited access to healthy food options (Chan et al., 2019). Traditional food access does not meet current needs, with over half of all adults reported that harvesting traditional food is impacted by industry-related activities, as well as climate change. The price of healthy foods in many First Nation communities is much higher than in urban centres, and is therefore beyond the reach of many families (Chan et al., 2019; Lam et al., 2019; Skinner et al., 2013). However, traditional food systems remain foundational to First Nations. Traditional food is generally preferred to store-bought food, is of superior nutritional quality, and its inclusion significantly improves diet quality.

The Community Well-Being Index (CWB Index) (Government of Canada, 2019) measures socio-economic well-being for individual communities across Canada, and is derived from the Canadian Census of Population data. The index is composed of 4 components – education, labour force activity, income, and housing – that are then combined to provide each community with a well-being score. The scores between Indigenous and non-Indigenous communities are then compared. Physical and emotional health, cultural continuity, and environmental conservation are 3 aspects of well-being that are excluded from the CWB Index. In addition, the CWB Index excludes traditional economic activities. Colonial conceptions of food infrastructures and food security lack the lived experiences and perspectives of Aboriginal peoples (Kepkiewicz & Dale, 2019; Skinner et al., 2013). Furthermore, there is mistrust towards census tools by many Indigenous communities so the CWB Index as a whole may lack the perspectives of Indigenous peoples.

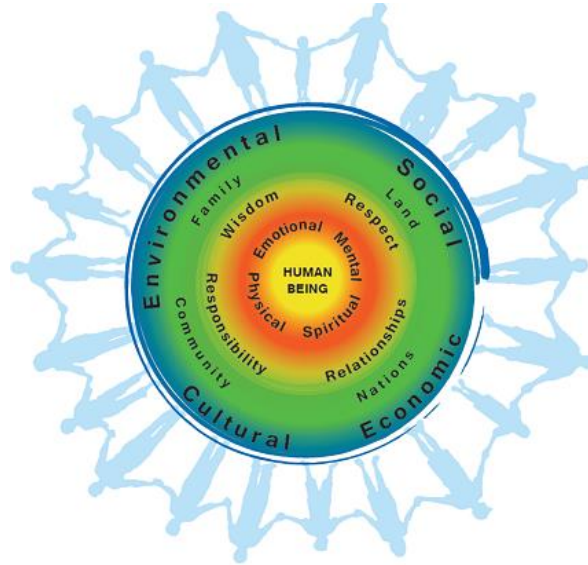


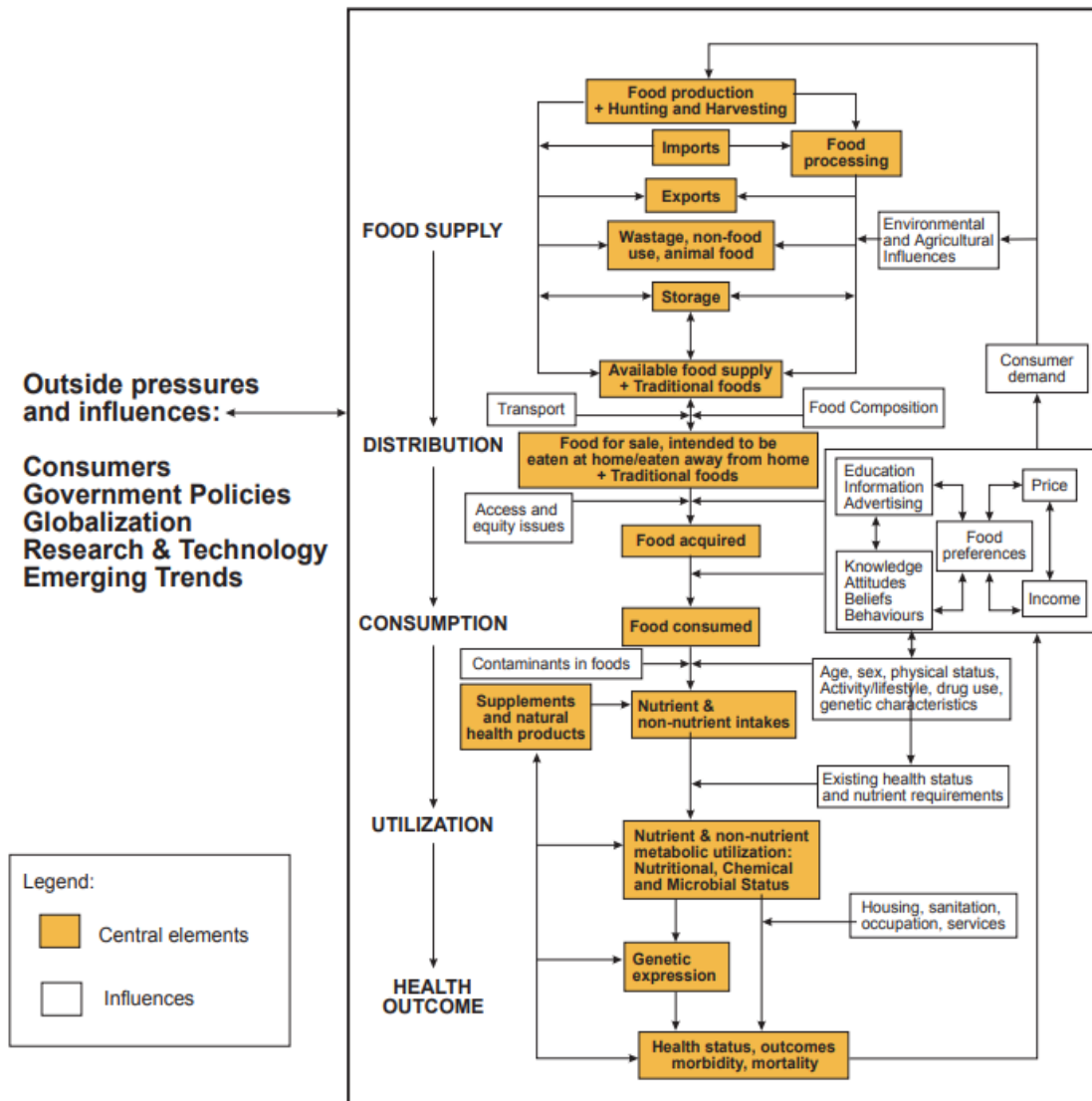
Figure 2 The First Nations Perspective on Health and Wellness  
Source: (Gallagher, 2019)

This visual depiction of the First Nations Perspective on Health and Wellness was created by the First Nations Health Authority and First Nations communities of British Columbia to conceptualize what holistic wellness may look like, as it incorporates socio-economic as well as environmental and cultural well-being (Gallagher, 2019). “Upholding Indigenous peoples’ inherent right to self-determination is fundamental to an Indigenous approach to health and wellness” (Gallagher, 2019, p. 6).

Traditionally scientific fields, such as biology and ecology, have expanded to include cultural and social considerations i.e. socio-ecological systems. However, this expansion has led to ethical implications when working with First Nations communities in co-management capacities (Lepofsky & Lertzman, 2018). Lepofsky and Lertzman argue that “you need to meet communities where they are at” to even begin building decolonizing relationships (2018, p.9). In recent years, there have been some successful collaborations in the realm of co-management (Randazzo & Robidoux, 2018; Salomon et al., 2018). However, conventional food security and community-based monitoring tend to fail to include information relevant to Indigenous food security such as the status of Indigenous food systems or environmental and climate change (Lam et al., 2019). In addition, food identification programs and policies may use colonizing and triggering language, such as the wording used by Health Canada to describe their ‘food and nutrition surveillance’ program and research (Dianne McAmmond and Associates,

2000). What is agreed upon is the importance for Indigenous peoples to have community ownership, control, access, and possession of data (The First Nations Principles of OCAP™, 2014) when it comes to Indigenous self-determination as well as strengthening and understanding Indigenous food systems.

### Conceptual Model for the Canadian Food and Nutrition System



Adapted from the conceptual framework of the Australian food and nutrition system  
 Ref: Ian H. Lester. AUSTRALIA'S Food & Nutrition.  
 Australia Government Publishing Service, Canberra. 1994

Figure 3 The Conceptual Model for the Canadian Food and Nutrition System  
 Source: www.canada.ca

The conceptual model for the Canadian Food and Nutrition System is based upon colonial thinking and adapted from the Australian food and nutrition system. Even though the model is a starting point to discuss food and nutrition challenges, it neglects to expand upon several social, cultural, and health aspects, as well as the importance of connection to land, that are important to First Nations health and wellness. Without the inclusion of lived experiences of Indigenous peoples, the Canadian food and nutrition system and food systems planning stand to perpetuate colonial attitudes of commodification of food and land as resources (Braun, 2002a; Kepkiewicz & Dale, 2019). As Coulthard and Simpson (2016) argue, land provides a basis for Indigenous nations to revitalize their political orders and governance structures without replicating the white supremacist nature of settler colonialism that involves the removal of social and cultural place from the land. In this context, Indigenous food sovereignty is intricately interlinked with Indigenous political, social and cultural resurgence, which centers on Indigenous relationships with land as socio-cultural-economic place (Grey & Patel, 2015; Tuck & Yang, 2012). Indigenous relationships to land are rooted in ‘creation stories, not colonization stories, about how we/they came to be in a particular place – indeed how we/ they came to be a place’ (Tuck and Yang 2012, p.6).

## **2.5. Research Frameworks and Theories**

### **2.5.1. Photovoice and Participatory Action Research**

“Photovoice is a process by which people can identify, represent and enhance their community through a specific photographic technique” (Wang & Burris, 1997, p. 369). Following the framework of Participatory Action Research (PAR), photovoice was developed as a means for enabling people to identify and think critically about themes, strengths, and issues that are posed within their communities and lived experiences (Wang & Burris, 1997).

PAR draws on the work of Paulo Freire, a philosopher who aimed to empower and engage with people who have been historically underrepresented. As quoted in Baum et al. (2006, p. 856), Freire states that:

Reflection without action is sheer verbalism or armchair revolution, and action without reflection is pure activism or action for action’s sake.

PAR has the potential to reduce the negative and colonizing effects conventional research has had on Indigenous peoples by employing community members as citizen scientists/researchers in improving community situations (Baum et al., 2006).

Photovoice is a form of community-based needs assessment coupled with community participation by citizen scientists. A significant emphasis of community-based participatory research is the ability for community members/citizen scientists to generate empirical evidence on social determinants of health, which can inform and influence policies (Katapally, 2019). Drawing from documentary photography, photovoice utilizes images taken by citizen scientists as seen through their perspectives and lived experiences. The images of a community are made by the people themselves. Being able to visually capture things of personal importance is a rewarding activity in and of itself. In addition, the capturing of photographs and the discussion following do not require the citizen scientist to have to read or write extensively, allowing another level of accessibility that conventional research may not have (Wang & Burris, 1997). Photovoice adopts feminist theory and is meant to empower vulnerable populations by valuing knowledge and lived experiences, taking into account masculine representations of power and representation, and recognizing local expertise and insight as shared by the community members (Castleden et al., 2008).

Photovoice has been used to address community needs through community participation in several diverse contexts, such as the empowerment of women in Yunnan, China to identify and share forms of injustice in rural communities (Wang & Burris, 1997); the advocating for programs and spaces to prevent violence and foster safe communities in Flint, Michigan (Wang & Redwood-Jones, 2001); the promotion of community solutions for the homeless (Wang et al., 2000); and the identification of cultural shock international students face when presented with the Canadian food system (Amos & Lordly, 2014).

Photovoice can help the Kitselas Nation build community capacity, knowledge, and record traditional food practices for future generations of the community. The identification of important food assets through photovoice can empower the Nation to act and advocate for the recognition and protection of culturally and ecologically important food infrastructures (Castleden et al., 2008). While reflecting upon their own lived experiences, citizen scientists can reconnect with their identity, their skills, and the land.

## 2.5.2. Practice Theory

Practice theory is employed in this study and is a useful theoretical framework to understand food security strengths and issues as well as to identify food assets in a community. The theory recognizes individuals' lived experiences that extend beyond locations, attitudes, and behaviors to include social and material contexts (Rouse, 2007; Shove & Pantzar, 2005; Soma et al., 2021). According to Shove and Pantzar (2005), practice theory identifies three elements as key to shaping practices:

1. Material (objects, technologies, infrastructure, tools, logistics, etc.)
2. Meaning (culture, values, paradigms, emotions, etc.)
3. Competence (knowledge, skills, expertise, etc.)

The three elements of Material, Meaning, and Competency contribute to the development of practices and to the reaffirmation of existing practices through a process of integration and co-evolution (Shove & Pantzar, 2005). In this study, practice theory can be applied to food provisioning practices, which includes growing, harvesting, cooking, fishing, eating together and other related activities. For this study, the elements of practice theory were adapted to the following:

1. Material (built environment, nature, places and spaces, infrastructures that are key to supporting food access and food security);
2. Meaning (the emotions and identity around food, food access, food culture both past and present, hopes and aspirations as it pertains to food); and
3. Competence (skills and learning around food).

Practice theory has not been applied at the community-level to understand food security and the identification of food assets from a First Nation's perspective. In addition, the three themes are often identified as separate. Similar to Shove and Pantzar's interpretation of practice theory, an Indigenous perspective illustrates an interconnectedness between land, water, and tools (Material); knowledge and skills (Competence); and culture, family, and traditions (Meaning) (Fee, 2009; Gallagher, 2019; Levi, 2020; Morrison, 2020).

The settler-colonial structure in Canada has actively separated Indigenous peoples from their lands and waters (Material), knowledge and governance systems



(Competence), and their cultural and spiritual identities (Meaning). The forced dispossession of Indigenous peoples from their lands and waters, their ways of being, and the attack on Indigenous bodies contributed to the current day food insecurity and lack of food sovereignty experienced by numerous Indigenous communities in Canada. In order to ensure Indigenous self-determination and community resurgence, there needs to be a reconnection of Indigenous peoples with their spiritual, cultural, and physical relationships with the natural world (Corntassel & Bryce, 2012; Fee, 2009; Morrison, 2020).

## Chapter 3. Methodology

### 3.1. Research Design

This study was approved by Simon Fraser University's Research Ethics Board and was conducted from September 2020 to June 2021. Recruitment was conducted via snowball sampling. In partnership with the Kitselas Lands and Resources department, community members from the Kitselas First Nation were invited to engage in a citizen science and food asset identification photovoice project. Recruitment posters were shared with the Kitselas Lands and Resources department as well as with a local contact for distribution to ensure diverse representation from the community.

Seven people were identified, and six citizen scientists (n=6) were included in the analysis and results. One person (n=1) conducted 1 of 2 of the interviews and was not included in the final analysis. Photovoice has been used to add context through photographs, personal stories, and illuminated insights (Florian et al., 2016; Fraser, 2016; Hammer et al., 2015; Wang & Burris, 1997). The photovoice method evolved to empower marginalized communities to tell their stories through photography and guided discussion of these photos to understand their meaning and links to empirical application. Utilizing a citizen scientist approach can help ensure capacity building within the community under the PAR framework.

Selection criteria for citizen scientists included being 19 years or older and committing to up to 30 hours for photographing and meetings. Citizen scientists were compensated \$26.58 per hour for 30 hours upon the receipt of photos, quotes, and biographies. The wage of \$26.58 per hour was determined as a livable wage for British Columbia.

Two of the citizen scientists were born and grew up in Hartley Bay upon the land of the Gitga'at First Nation. Both of these citizen scientists later moved to Kitselas territory. One of the citizen scientists was born in Kitselas and moved away to recently come back in the past few years. Two of the citizen scientists were born and currently live in Kitselas. One of the citizen scientists was born upon Nisga'a land and moved to Kitselas.

Due to the COVID-19 pandemic, in-person research activities were suspended by the SFU Research Ethics Board. All correspondence and meetings were conducted virtually via video conferencing (Zoom) and email. An initial 30 minute meeting was coordinated with citizen scientists to discuss the research project, ethics, and commitments. Upon agreement, citizen scientists captured stories and photos they felt comfortable sharing for the research project and/or for community-facing mapping resources. Two interviews ranging from 1 to 1.5 hours long were set-up with each citizen scientist to discuss the research themes in relation to their stories and photographs. Interviews were recorded and transcribed via otter.ai, and then reviewed for accuracy and edits. Afterward, photos were matched with stories and quotes for analysis and publication. Interviews were thematically coded and analyzed in Nvivo 12 with a codebook developed by the author.

### **3.2. Data Analysis**

A qualitative, deductive, thematic coding approach following practice theory was applied based upon the categories of Material, Meaning, and Competence (Rouse, 2007; Shove & Pantzar, 2005). Codes were further analyzed and categorized by themes and sub-themes in Nvivo12 (Figure 4).

1. Material (built environment, nature, places and spaces, infrastructures that are key to supporting food access and food security);
2. Meaning (the emotions and identity around food, food access, food culture both past and present, hopes and aspirations as it pertains to food); and
3. Competence (skills and learning around food).

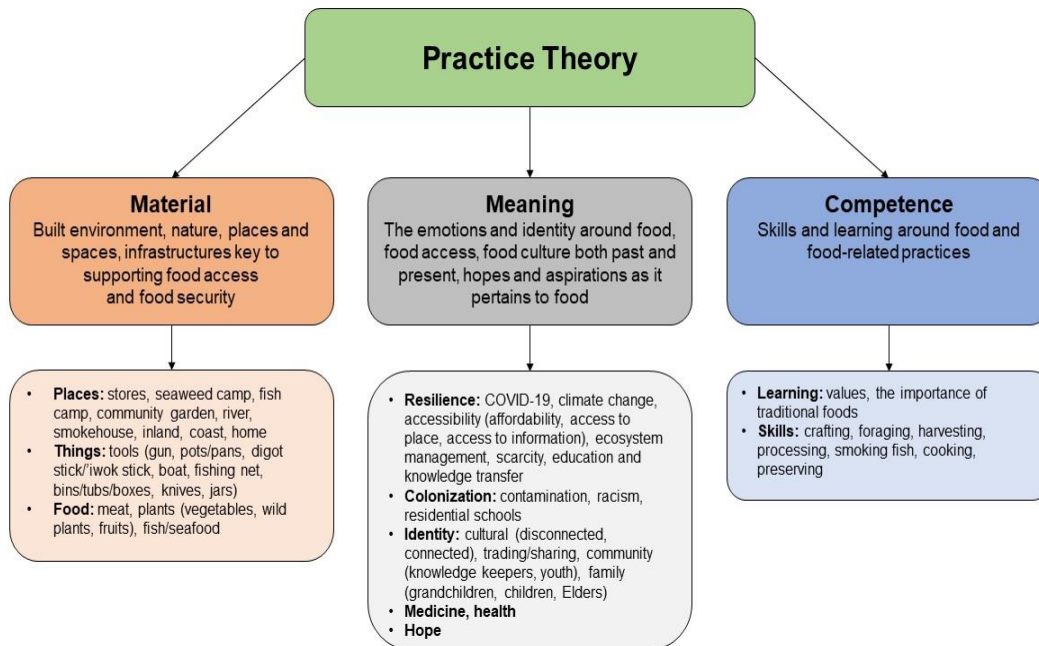


Figure 4 The thematic coding map

### **3.3. Limitations**

There were challenges conducting this study during the COVID-19 pandemic. Originally, the initial meetings and interviews were to be held upon the lands of the Kitselas First Nation from April through August 2020. In respect of the Kitselas First Nation's health and security and the provincial health orders, the research was shifted to an online and virtual format. Consequently, interviews began at the end of August 2020 and progressed through to April 2021. With the past and current mistrust of institutional and research entities within the community, there were challenges in recruiting and retaining citizen scientists in lieu of in-person relationship building. Building trust is foundational for establishing working relationships around land-use and land management (Cruickshank et al., 2019). In addition, there was a lack of technological capacity at times as well as difficulty with contacting and scheduling meetings with participants. Understandably, this project was not a priority for many participants given the context surrounding COVID-19. This study was also limited by the small sample size. According to Wang & Burris (1997), the ideal number of participants in a photovoice study is 7 to 10 people, whereas this study had 6 people.

## **Chapter 4. Findings and Discussion**

Reflecting upon the three elements from Practice Theory and the stories, photographs and lived experiences shared by the citizen scientists, several themes emerged in various narratives. The themes of Material, Meaning, and Competence were identified in stories as interconnected with cultural practice with land, identity, learning, and wellness. In this section, the findings have been categorized into two main themes: 1) Food and place as identity and wellness and 2) Colonization's impacts on culture, land and wellness. The two themes are further divided into several key sub-themes.

### **4.1. Food and Place as Identity and Wellness**

Food and place are important to cultural identity, family connections, and health. The citizen scientists shared that knowledge holders could be friends, family, or Elders, and that knowledge was passed down through creation stories, experiential learning, and observation. Family comes first, yet there was a recurring theme shared by the citizen scientists that spoke to the importance of sharing knowledge, food, and experiences with one another as forms of ensuring individual and communal food security and food sovereignty.

#### **4.1.1. Food and Place as Identity: Community and Family**

*The Indian sense of natural law is that nature informs us and it is our obligation to read nature as you would a book, to feel nature as you would a poem, to be part of that and step into its cycles as much as you can.*

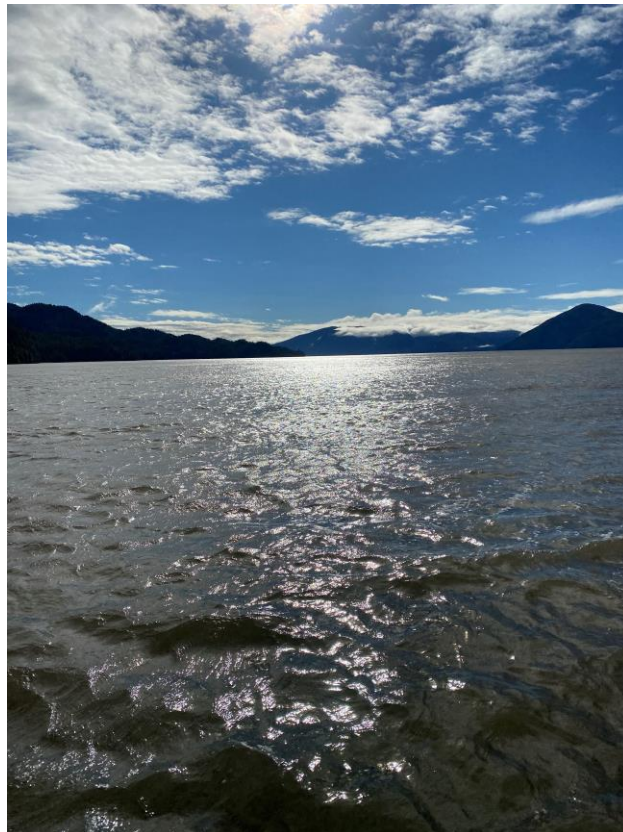
~John Mohawk, Haudenosaunee Scholar and Author (1945—2006)

The land is inextricably linked to identity as is emphasized by the cultural responsibilities and relationships that Indigenous peoples have with the environment (Coté, 2016; Kepkiewicz & Dale, 2019). Indigenous forms of eco-philosophy reinforces the belief that humans do not manage the land, but instead manage their own behaviours in relation to the land (Fee, 2009). Through the sharing of culturally accumulated ecological knowledge by family, community, and Elders, Indigenous self-determination and

sovereignty over the land and the food system can be expressed and recognized (Cornthassel & Bryce, 2012).

Skinner and colleagues (2013) noted there are seldom any studies that look at how traditions of sharing and reciprocity of food contribute to food security; how communities, individuals, and families cope with food shortage; or what strategies or solutions have worked (or not) in the past. The citizen scientists spoke to these points and identified other important assets that contribute to their sense of food security. Food assets and food spaces, such as the Skeena River, smokehouses, fishing points, and berry harvesting areas were identified as important to the citizen scientists.

One citizen scientist, Desi, reflected upon the importance of the Skeena River to not only the Kitselas First Nation, but also to other peoples within Terrace and the surrounding communities:



*Figure 5 Photo of the Skeena River*  
Credit: Desi

*People would come together and harvest and then process oolichans into grease. There were all of these different villages working together. Around February is when oolichans come in, that's when people were most happy. That's their first fresh feed that they would get to harvest and feed their family with. I don't think [people] realize how important [the oolichans] are. (Desi)*

Desi recounted the anticipation people felt when a certain time of year came around which emphasizes the importance of the arrival of fish as more than food, but also as a social function tied to the practice of fishing (Schreiber, 2002).

*I think the old people would base [the oolichan run] on weather patterns. Just by looking at [animal] scat and dead animals, they would examine them and see what was going on. By those few things, they were able to tell if it was gonna be a good year or a bad year. I know with the Nisga'a up here, for the oolichan run, they base it on the moon, whichever way the moon is facing, you know, the crescent moon. If its facing like this, it's going to be a plentiful year. But, if it's more tipped over, it's not going to be a great run. (Desi)*

Knowledge about fish, the fish runs, and how to fish is a cultural asset that can be shared with present and future generations and serves as a form of cultural resurgence. Every time someone shares a feast involving fish or shares where to find an abundance of fish, the social and cultural practice surrounding fish is recreated and reinterpreted. Leanne, another citizen scientist, shared her view on the timing of fishing and preparing the fish once harvested:

*Like I always say, fish don't wait for nobody, right? Once you get it from the river, you have to be on the go, go, go until it's totally done, or else it'll get sour. You don't want your fish to wreck. By the time this is done, we're tired. But it's a good tired. We're just so proud. Like, look at all this. We just can't believe we did all that. (Leanne)*

Being independent and self-sufficient means there is less reliance on colonial food systems. The practice of fishing, preparing fish, and enjoying eating fish illustrates the interconnectedness of Material, Competence, and Meaning. Spending time travelling to fishing spots, harvesting, and preparing food is ingrained in the sense of identity, as shared by another citizen scientist, Darren:

*We were taught to harvest. It's hard and excruciating work. But it got to the point where we couldn't wait to do this part. For example, we got a place where we go and harvest halibut, abalone, seaweed. You spend a month and a half going there. And you have to spend a lot of money to get there, boats and this and that. And as you get up at five o'clock in the morning, four o'clock in the morning, three o'clock in the morning, then you go and set the net. Then you wait all day and then you pile it up, you pick it up, then you have to bring it in. But then you have*



*to go get water, then you have to go get wood. You know, it's tiring, excruciating. But I grew up and I learned, oh, man, I can't wait to do that. I just can't. (Darren)*

Key cultural values inherent in Indigenous ways of knowing include sacred and respectful relationships, reciprocity, and interdependency (Dawson, 2020). Spirit, life force, exists within each animal, yet it does not die with the animal. "Animals are not simply killed for food; they are gifts to hunters who have acted respectfully" (Dawson, 2020, p. 88). Lynn, another citizen scientist, shared her values of relationality and reciprocity when it comes to fishing for her family:



*Figure 6 Photo of Leanne and Fred's family fishing at The Main Point  
Credit: Leanne and Fred*

*We take only what we need. That's the thing. When we fish, we fish for our own family, so my parents, my brother, my sister, me. We all get together and harvest together. When you harvest, one of the biggest things is that family bonding time. That's where you get to nurture one another and get to know one another, and learning how to respect. (Lynn)*

Lynn emphasized the importance of fishing as a family as it tied her back to her cultural traditions. She also spoke to a sense of scarcity and the unwritten rule when it comes to sharing the fishing spot with others in the community.

*We go by what's called the two-day rule. Two days you go fishing per family, so that's the general part of it. Sometimes there's squabbling about how long a family uses the main point because the main point is the MAIN POINT. Everybody has to take turns. (Lynn)*

The Main Point is a place (Material) tied to Kitselas identity and food security as it represents how important sharing food (Meaning), harvesting techniques (Competence), and experiences (Meaning) are to the cultural integrity of the community. Asset mapping and identification tends to exclude informal places and knowledge that are important to the identity of a community (Jeannotte, 2016). Being a natural infrastructure, locations such as The Main Point are typically neglected in colonial forms of food asset identification since community voices, especially Indigenous voices, have been historically excluded in colonial forms of planning (Mannell et al., 2013).

Upon several occurrences, the citizen scientists referred to *Area 13*, which is not a specific place but is rather a code for, "this place is secret." Knowledge about *Area 13* is held by few knowledge keepers and is often shared with others through stories or through practice and observation. *Area 13*, or culturally keystone places, are fundamental to fostering socio-cultural and historical community connections to the past and present biological world (Lepofsky et al., 2017).



*Figure 7 Photo of red snapper*  
Credit: Darren

*My dad's friend, he said, "Let's go out today. Let's go, what do you want to do?" I don't know. I said I wouldn't mind some snapper. He goes, "Okay, let's go. I want to take you to my secret spot." He said, "You only get red snapper here. And then I'll show you what we do for halibut." And he took us out. And we went I guess for 45 minutes. And then we were close to the shore. And he looked around and he backed up. He goes up further. "There's a big rock there," he goes. "You watch this. See that rock there?" He said, "You watch." He said, "Now look over there, you see that other rock, those four rocks that look like they're lined up?" I said, Yeah. He said, "Get in the middle of them and come out maybe, I don't know, half a net length." And we backed out and he dropped a hook, and we jigged<sup>2</sup> and we got snappers, just snapper, and we got 27 of them. He goes, "Did you get enough?" I'm like, yeah! He said, "This place is where we get snappers. You come here for halibut, you try and see if you get any." We went down and he showed us a place to get halibut. One day I decided to go without him and I brought a couple of my friends in, and said do you want to get some red snapper? They go, yeah! Guys, I know where to get some snapper. Went to the same spot, did the same thing he told me and to this day we still go out there and get just red snapper. (Darren)*

The redistribution of food, knowledge, and resources acts as a vehicle of Indigenous government (Fee, 2009). It is the act of giving food that creates relationships that are attached to reciprocal responsibilities, which differs from the "workmanship ideal" where individuals are entitled to the fruits of their labour (Manson, 2018). "In market economies, the workmanship ideal allows self-owning people to expropriate nature, produce commodities, and engage in voluntary exchanges of commodities with other self-owning people" (Manson, 2018, p. 220). Another citizen scientist, Clarisa, shared the importance of trading and sharing to cultural identity:

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<sup>2</sup> **Jig, jigged, jigging:** the practice of fishing with a jig, a type of fishing lure. The jig creates a jerky, vertical motion to attract fish.



*Figure 8 Photo of swaaniik – herring eggs on kelp*  
Credit: Clarisa

*[We have] a modern day grease trail. It's all word of mouth. There's a Facebook group from Bella Bella and they've got the best swaaniik. I got swaaniik from some fellas and they were distributing. They had an offer from a group of people in Rupert, to buy the whole lot for twice as much as they were willing to give it to us. And they said no. They said no because they knew the importance of having to share it. They wanted that cultural significance of being able to trade and share, you know, because we would have had nothing that year if they did that.*  
(Clarisa)

Building community capacity and engagement can help advocate for food security initiatives and help protect culturally important spaces and practices (Skinner et al., 2013). Clarisa shared the importance of having a community garden to involve youth and their families in creating local food security:



Figure 9 Photo of tomatoes in the community garden  
Credit: Clarisa

*We have something called the community garden, which is a huge greenhouse. Inside, they grew tomatoes, potatoes, green peppers, a whole bunch of stuff. Whoever wanted to have a planter box, they were able to plant whatever they wanted with the help of our community garden employee. Our youth coordinator is actually involved a lot with this too, so the youth get out there. And I think that's how they kind of rounded up the families. They get the youth involved which starts getting the families together to grow food together. It's been going on for probably a couple of years.*

The recounting of learning and skills was always linked to memories, places, and experiences. Rarely was there a distinction between Material, Meaning, and Competence as these are all linked. Food sovereignty and food security extends beyond nutrition. Darren shared his memories of informal gatherings to enjoy food and maintain community connections:



Figure 10 Photo of a plate of traditional foods  
Credit: Clarisa

*In Hartley Bay as we were growing up, nine o'clock at night, no matter whose house you were at, we had a coffee. This is when the spread like this stuff was brought out. Sit down. Enjoy this with us. Stuff like smoked meat or fish. Nine o'clock every night. It's always been a ritual.*

*I tell you, you sit there and you listen to them, [the Elders]. They eat and they talk and they laugh. To hear it in your own language, Sm'algyax, is something else. That language is disappearing. I hate to say it, but it's disappearing. I'm trying to teach my granddaughters everything. But this is an excuse for a gathering, an excuse to renew our bond between each other as humans. (Darren)*

The practice of feasting, or the potlatch, allows the Chief to ensure unity, law, and authority of their House and their territory, for all to witness. The feasts affirmed the connection between food and the land (Fee, 2009). "Knowledge about food is locally produced, maintained, and transformed through the passage of time" (Schreiber, 2002 p. 375). As a child, Fred remembered looking forward to the summer to visit his grandparents and to help with fishing and smoking fish:



Figure 11 Photo of Fred in his family's smokehouse.  
Credit: Leanne and Fred

*I didn't see my grandparents much for about 10 months of a year. And then summer vacation. I would always go back up to Greenville (Laxgalts'ap) for two months straight. So, in that amount of time I would go fishing with my grandfather on the river. And then, probably in the same day, I would pack all the fish up to my grandmother's smokehouse and I would help my grandmother. She would shoo me away, right? I always wound up going back to my grandmother. I just love when my grandmother would come out of the smokehouse. She'd have that aroma about her, like someone fresh out of the smokehouse. I would make up an excuse to go and hug her. To be able to go up and get a good sniff of her. (Fred)*

A recurring theme among the citizen scientists was the reciprocal responsibility of sharing knowledge with youth once you become an Elder. Desi shared the importance of involving youth in cultural practices as it takes time for the lessons to be fully understood:

*I keep referring back to the youth because we need to engage them in these things, even if they think they're tedious. You know, when they get to around 21 years old is when some things start clicking. It's important to get berries, then at least we have jam, right? Or we know we can preserve them. And at least we have that if we can't afford to go buy it. It is about 21 when it starts clicking like, that's why you did that. And it's like, yes. (Desi)*

Leanne and Fred shared how they host an annual fish camp to teach the community about smoking fish:



Figure 12 Photos of Leanne and Fred preparing I'wok sticks at Fish Camp  
Credit: Leanne and Fred

Leanne: *We had a fish camp last year in Kitselas. You know, we're not holding any secrets. Maybe a few. But I'd rather have other people in our community to know how to preserve their own.*

Fred: *When we did the fish camp, they didn't really get it, they didn't get a true taste of the whole process... they just came in, they made the strips. After the strips were made, they walked away and left the rest up to us. So, if you really wanted to get it, if you wanted to get a true taste of the whole thing, then a person would stay right from taking the strips off, right until we're actually putting the strips onto the sticks. And then once the strips are fully dried, then you're packaging up the end product.*

Some of the citizen scientists recounted personal anecdotes that they did not experience a complete realization of the importance of the lessons taught during their upbringings until they reached adulthood. Indigenous youth tend to link traditional foods as being part of or from the natural environment even if they have had limited exposure to their Indigenous cultures (Hanemaayer et al., 2020). However, exposure to these teachings while they are children is critical to gain this understanding and appreciation.



### 4.1.2. Traditional Foods are Good Medicine

*Everything is One. The Creator made all things one.*

*All things are related and interconnected. All things are sacred.*

*All things are therefore to be respected.*

~Dr. Richard Atleo, hereditary Chief of Ahousaht

The Medicine Wheel is a mental construction of Indigenous views on the holistic interconnectedness between culture, wellness, and nature (Marchand et al., 2020b). “A medicine wheel depicts how the spiritual and physical aspects remain connected to the land, and also the relationship of people to nature through ecological calendars” (Marchand et al., 2020b, p. 4). The relationship between people and the land is shared through the intergenerational transfer of knowledge and practice. Indigenous knowledge frameworks illustrate the importance of addressing the scarcity of knowledge at a local level instead of at a larger scale (Marchand et al., 2020a, 2020d), emphasizing the realism that there are times of uncertainty that may not have a fixed beginning or endpoint, but that a solution can be attained through the balanced consideration of the connections and relationships within the medicine wheel. Leanne reflected upon the feeling of scarcity when her family’s stock of jarred fish was depleting, and how fish is valued in the home and connected to their health and wellness:



Figure 13 Photo of the practice of jarring salmon  
Credit: Leanne and Fred

*If we're going into July and we don't have any jarred fish [from the previous year], I'm worried. Even at the end of June, I'm bugging [Fred]. We need to get the net and we need to... once my jarred fish is done, I feel okay. The rest is easy to me, like the smoked fish and that because we can totally just slay them. But the jarring takes a little more time. Just by cutting, stuffing, jarring, pressure cooking, so I worry. But once they're done, then I feel the security.*

*[Our] youngest girl – We always giggled about it, because she was the one that didn't really like fish. And that's all we had. She was craving cutlets one day and one of the other girls told the one that complained, just pretend it is chicken cutlets. Just close your eyes and pretend it's cutlets.*

*The Indigenous population got diabetes and stuff like that from the drastic change in the diet. Harvesting fish is one of the blessings that keeps that in check. It's just a norm for us. I don't know how it would be if we didn't have fish.*  
(Leanne)

Culturally important foods, such as fresh fish, symbolizes good food (Schreiber, 2002). “If eating wild salmon represents health, then eating farmed salmon represented sickness” (p. 366). Other culturally important foods include plants such as devil's club, which has a mixed reputation in the community for its difficulty to prepare and process

into useable forms. Desi reflected upon her observations over the years as a reason to better understand traditional medicines:

*I was trying to learn about our traditional medicines, because just over the years, and realizing, so many of our Elders are on so many different pills, and they cause so many different side effects. And, you know, just trying to find items that's easily graspable. And they can just rub in, like, like this right here, devil's club salve. It's pretty easy to make. And these are the kinds of things that I think a lot of our community members need to know like, you don't need to run to the store and buy some kind of rub, you can use this, I use this on my back, I use it in my aching muscles, I use it for my eczema ever since I started using it for my eczema I used to get it really bad on my hands. Since I started using that I rarely get a flare up. (Desi)*

The act of feasting can bring about spiritual wellness. Engaging in spiritual activities is important for passing down knowledge and a respect for the natural world (Marchand et al., 2020a). Darren illustrated the connection between the physical world and the spiritual realm:

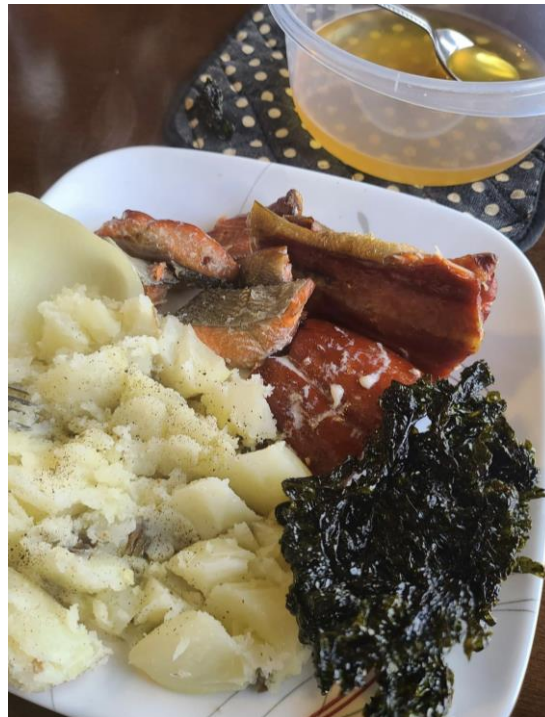


Figure 14 Photo of a plate of traditional foods  
Credit: Darren

*When my dad passed away, I was scared to move into the house. Once in awhile I hear 'knock,' so we believe that they're coming to visit, looking after us, letting us know. And then we think about what's their favorite food and we put it out on a*

*piece of cedar. Chunk of potatoes. Chunk of oolichan grease on the seaweed and herring eggs. We put it on the fire, and we call them. Dad, this is your meal. Mum, this is for you, Grandma, this is for you. Grandpa. This is for uncle, this is for you. Seaweed, fish, potatoes, grease. Dad, he was a connoisseur of Coke. So, we put a can of coke in there. And it bubbles away and it simmers. We say, look how greedy he is, he really misses Coke.*

*I used to put big plates full, then I spoke to an Elder and he said, "If you put a chunk about inch by inch, then you get more different foods." So, I did that, cockles, clams, herring eggs. And he says, "When it goes into the spirit world, it grows." He said, "Once they see the food, your dad will grab the plate, people's spirits will come together to taste the food, stuff they've missed forever." You're not just feeding the one person, you're feeding the grandfather, the cousins, and so on and so forth. The rest of the elders in his era. It's a spiritual gathering. We know it on Earth as a feast, they do it in the spirit world. As we have a feast, we feed everyone, we make sure nobody is left out. And the same in the spirit world, they gather. (Darren)*

Everything has life force, it does not die once the body dies (Dawson, 2020). In many Indigenous origin stories, humans tend to be stated as the last species to arrive on Earth, meaning humans arrived being dependent on an already-functioning society (Watts, 2013). It is with the help of other animals that humans were able to create territories and humankind, illustrating the shared life force and the interconnectedness between all beings (Watts, 2013).

## **4.2. Colonization's Impacts on Culture, Land, and Wellness**

*Who will find peace with the lands? The future of humankind lies waiting for those who will come to understand their lives and take up their responsibilities to all living things. Who will listen to the trees, the animals and birds, the voices of the places of the land?*

*As the long forgotten peoples of the respective continents rise and begin to reclaim their ancient heritage, they will discover the meaning of the lands of their ancestors. That is when the invaders of the North American continent will finally discover that for this land, God is red.*

*Western civilization, unfortunately, does not link knowledge and morality but rather, it connects knowledge and power and makes them equivalent. Like almost everyone else in America, I grew up believing the myth of the objective scientist. Fortunately I was raised on the edges of two very distinct cultures, western European and American Indian. . . .*

~Vine Deloria, "Red Earth, White Lies: Native Americans and the Myth of Scientific Fact" (1997)

### 4.2.1. Colonization's Impacts on Culture and Knowledge

The idea of culture or being cultured elicits images of the surface characteristics of a group of people (Marchand et al., 2020a). Many cultures are not linked to nature and instead hold egocentric views of nature itself, where decisions are made by individuals instead of thought as belonging to a group. Western European views of nature have perpetuated thoughts about the environment as a resource for extraction, separating the people from the landscape (Braun, 2002c; Marchand et al., 2020a). Whereas, Indigenous peoples have a holistic view of nature that is intertwined with culture. At the surface, there are similar physical characteristics between the cultures of different Indigenous peoples, but it is the deep culture that is difficult to understand since they can reflect values and beliefs passed down through generations (Marchand et al., 2020a).

When Western European colonists invaded what is now known as Canada, they observed the physical and superficial characteristics of the numerous Indigenous communities and made assumptions about Indigenous ways of life (Braun, 2002b). Darren reflected upon the historical misrepresentation of Indigenous peoples:



*Figure 15 Photo of a refrigerator stocked with oolichans*  
Credit: Lynn

*People make it sound like we're starving. And that oolichans are all we can eat. Yeah, there was hunting, there's, you know, trapping. And it really irks me. We weren't starving. It's in the stories – all the Indians were starving and the oolichans came and saved them. No, man, we just got through it. I tell people this on educational tours and people argue with me like, this is how it was. I'll give you a really good example. This lady said, "No, no, that's not right. I read from the book." And I said, Okay. Excuse me. I said, I think that's the difference between me and you. You know, you read it and you learned from a book. I said, we're still living it. (Darren)*

The identities of Indigenous peoples were misconstrued to fit a Western European narrative of the primitive, ecological noble Indian that required a white saviour (Braun, 2002b; Nadasdy, 2005). The perpetuation of the ecologically noble Indian is especially harmful as this perspective denies the realities of lived experiences by treating Indigenous peoples' as one-dimensional and sets an unattainable standard where Indigenous peoples are made to be puritans, thus erasing Indigenous identities and connections to land and water (Nadasdy, 2005). It is the absence of cultural history, through intentional erasure and omission, and the replacement with colonial history that produces marginality and stereotypic views of Indigenous peoples that pervade into present society and consequently strengthens the settler-colonial structure in Canada (Braun, 2002b).

Traditional ecological knowledge, foodways, and foods are closely connected to language and culture as well as to territory (Fee, 2009). Settler-colonialism has created an intergenerational disruption to Indigenous ways of life, community knowledge, and cultural practices. Desi reflected upon how residential schools impacted the Kitselas community:



Figure 16 Photo of a child learning to tsal fish at Leanne and Fred's fish camp  
Credit: Leanne and Fred

*I find that the Kitselas community, living so close to Terrace, a lot of knowledge was forgotten. A lot of it just didn't happen again. I have a feeling it has to do with residential schools, and when the parents got out [the knowledge] was lost.*

*My dad was the biggest person I relied on if I had a question in regards with what to do. He'd be able to point me in the right direction. So, now that he's gone, I have to seek those people out which is a bit harder because my dad knew so many people. It was easy for him.*

*I notice, even the disconnect comparing my dad to his sisters. My dad knew the old ways. He grew up with his grandparents and they took him out of the village and hid him when [residential] school was starting so that he wouldn't go. He learned the old language, the old traditional ways.*

*We're pretty fortunate, me and my one brother paid attention a lot. I was always interested in learning our traditional ways – Why things were done the way they were, so when we moved to Terrace and having not only Kitselas but Kalum people not knowing their traditional ways, like even just berry picking and what not, it was a shock to me to find that out. It took me years to figure out why there was such a disconnect. (Desi)*

With the removal of Indigenous youth from their communities, the intergenerational sharing of knowledge was disrupted. Instead of having cultural teachings be a natural integration into daily life, some of the residential school survivors had to actively seek out the remaining knowledge keepers to learn about their cultures. Desi reflected upon the importance of language and the nuances that come with having an oral, instead of a written, history:

*Even with just the language. Our language. Through all Tsimshian territory, it's all the same. There's slight differences. We grew up hearing it on a daily basis. And up here it's not so common. There's not many people in Tsimshian territory up here that could even understand and speak. There's Elders speaking the language. I can pick and choose words and basically decipher what they're saying, whereas local members, community members, have no idea what they're saying.*

*My aunties speak it. I actually have audio of our Sm'algyax language. It's basically lessons. Whenever I have a chance, I have it playing in the background. I'm like, oh yeah, that's how you say it.*

*Whenever me and my niece were around, my dad would only speak to us in Sm'algyax. He would direct us to do something or ask us a question or just generally talk to us in Sm'algyax and we would respond. But we would answer him in English and not Sm'algyax, it was pretty funny.*

*We would discuss with people, why don't you just record it, why don't you just document it? No, that's the struggle. You don't understand. Just like English, there's different ways of saying different things. It depends who you're talking to. Times have changed, you know. How does that reflect on our language? There's different ways for counting people, counting animals, counting trees, counting boats. It's not as easy as people like to think it is. And then phonetically there is no written language so you kinda just write it down how you hear, which will make sense to you but it won't make sense to somebody else. (Desi)*

The act of practicing traditional skills is intricately connected to sharing knowledge and to identity (Beaudin-Reimer, 2020). With the loss of some oral histories, the knowledge on how to find, harvest, and prepare certain traditional foods has been forgotten.



## 4.2.2. Colonization's Impacts on Land

*While there is a growing knowledge about the impacts of climate change on species and ecosystems, the understanding about the potential impacts of climate change on livelihoods and cultures of Indigenous and traditional communities is fragmented. Furthermore, there is a lack of recognition of the importance which traditional people will play in their own future adaptation to climate change.*

*Cultural resources, both tangible and intangible are very critical and sacred; and, Indigenous people feel they need to protect what little remains.*

~Rodney Cawston (Confederated Tribes of the Colville), in (Marchand et al., 2020, p. 4)

Colonization has contributed to the present-day climate change and contamination issues seen throughout the food system. The industrialization and commodification of land, food, and people has negatively affected Indigenous access to traditional foods and places, yet there is a disregard for the integrity of Indigenous homelands in conservation work and policies (Settee, 2020). The globalized and commodified food system is one of the biggest drivers of climate change, accounting for over 1/3 of all global green house emissions (Tubiello et al., 2021). Global warming, rise in sea level and temperature, and the change in weather patterns has immensely impacted the Earth's capacity to grow foods (Settee, 2020), thus affecting traditional forms of food harvesting, foraging, and growing. The normalized extraction of soil from territory, of flesh from body, and flagrant pollution abstracts the land into a commodified resource that disrupts Indigenous ways of relating to land (Watts, 2013).

Indigenous Elders foresaw the climate effects that colonization was having on the wildlife and would have into the future. Darren recounted what his grandfather and the Elders shared with him when he was in his youth, several decades ago:



Figure 17 Photo of Dungeness crab  
Credit: Darren

*Everything we get out of the ocean is a treat. As we are Elders, now that we learnt from our Elders, who learned from their Elders, my grandfather, he said, "Enjoy everything." And there's like, what, what's going on? He goes, "It might not be here." He said, "Maybe not in your time, but it's gonna disappear."*

*It started with residential school. It distorted our stories and our lives. All of a sudden, we gathered to survive. Now, everybody's gathering to make money and which is depleting our stash. So, I talked with my Elders and they said, "Every day is a treat that you get something out of the ocean, because one day they're gonna poison it." He said, "They're gonna find a way because the white man is greedy and their greed is overflowing." I watched this movie and it reminded me about what the Elder said. He says, "The earth gives so much. They asked for so much from Mother Earth. So, one day, she's gonna have nothing to give." And that's how we apply our thoughts. (Darren)*

Climate change and warming temperatures is contributing to the change in biology of diseases and parasites in some wildlife (Cable et al., 2017). Fred commented on the effects of climate change on the fish runs and how his family has adapted their practices to account for this:

*When it comes to the quality of the fish I've noticed over about the past five years now that the waters have been getting warmer, right? So, there's a worm inside of the gut of the fish that has been becoming more and more rampant with a warming of the waters. If we can remedy climate change, that'll be another big thing. Because we know that worm is there, we gut the fish right away. Throw it in our gut bucket, and then make sure that everything is out of out of the fish. And then we keep it under cold and running water. (Fred)*

With the warming temperatures, the red cedar trees are facing abnormal climate conditions. Desi commented on how the red cedars appear to be dying:



Figure 18 Photo of red cedar trees  
Credit: Desi

*You see the red on the trees? We've been seeing more and more red cedars becoming more red like that, which means they're dying. I'm concerned that it's going to be hard to get over the next 10, 20 years. These trees are in Kleanza Creek Park, and they're protected. I think it's the weather. We haven't been having our regular snowfalls. It's a lot warmer. Our summer was a lot wetter than usual. water levels were super high. I think it's just not getting cold enough. So maybe there's like bugs that are contributing to them dying. Or just disease?*

Even though the red cedars are located in a biologically protected area, the trees are still vulnerable to the sweeping effects of climate change. Climate change is also affecting water levels in the rivers and creeks, which impacts people's access to key fishing spots. Lynn commented on the scarcity of fish that comes with rising water levels:

*Fish is so scarce sometimes. There were years we could not harvest because the fish rock [at the Main Point] wasn't high enough, So, when we're not able to [go fishing] it gets scary because we don't know what fish we'll have for the year, for the winter. So, we do a lot [of fishing] during the year. (Lynn)*

Resource extraction practices can change wildlife migratory patterns, pitting wildlife and humans in competition for food and space (Mace et al., 1996; Proctor et al., 2012). Desi reflected upon her experience conducting wildlife surveys and the effects that industrial resource extraction has had on animal migratory patterns:



Figure 19 Photo of a moose bone  
Credit: Desi

*Over the past 15 years, we had Ballard [Power] come in with BC Hydro, so they did a lot of bush work. We've been seeing a lot more [wildlife] activity within Terrace and within the surrounding communities. A lot more wolves, coyotes, and black and grizzly bears. We're not the only ones that eat moose [who were displaced by the bush work]. This was taken up around the airport area, which is about five minutes out of town. [Moose is] an important part of the community and peoples' lives. A lot of people go out hunting. I hope the younger generation gets to experience, if not the hunting part, the preparing of the moose, so that they can realize [they] can go hunting for food and not just go to the grocery store. (Desi)*

With the increasing urbanization and industrialization around the City of Terrace, community members are finding they need to venture further from town to harvest wild

plants and to avoid pollution. Desi shared her thoughts surrounding the harvesting of plants:

*Anywhere there is a little stream or a little creek, even if you don't see much of the water, you're gonna find devil's club all along there. If you cut a branch off, you think you got it right at the root but the root system actually goes a really long time and these kind of shoot up wherever. For me, personally, I go to areas where there's not a lot of pollution. I try to go out of Terrace, just so that there's less pollution, like in Kitselas canyon. There's a nice driving trail. And then you can walk, it's just everywhere. I don't think people are aware you can just go down there and pick it.*

Several of the citizen scientists commented on how the Department of Fisheries and Oceans (DFO) closes fishing access for the Kitselas community if they deem the fishery to be scarce for the year. Darren shared his experience with the DFO:

*Every year I have a problem with DFO. Oh, there's not enough salmon going through, not enough salmon in the ocean. These guys are from Ontario. You know, back east. They're farmers. And they come in and tell us how to do it. They don't believe their First Nations people who have 50 years, 60 years, 40 years, 80 years of ocean experience watching the tide, learning the tide, learning the weather. Learning when the waters called red tide when you can't get shellfish. Yeah, and stuff like that. They're never in sync with us. They're always against us, they think they know better. And we as First Nations aren't smart enough. We argue the point every year about harvesting this, harvesting that. And they send people, and they say you need your first aid, your food safe. Well, you ever try this stuff? Then they say no. Well, you got no say over it. We've been eating it for eons.*

### **4.2.3. Colonization's Impacts on Health and Wellness**

Indigenous views on being healthy are better described as views on well-being that provide a holistic view of the person rather than the biomedical view of the physiological body (Dawson, 2020). Western forms of knowledge attempt to compartmentalize problems and fail to recognize the interconnectedness between natural cycles and the ethical behaviour of people toward the environment (Marchand et al., 2020c). The disconnect between Indigenous and Western European ways of thinking, and the belief by early settler-colonists that Indigenous views were inherently wrong and needed fixing, contributed to the establishment of the past and current day colonial policies and practices that have negatively affected the holistic wellness of Indigenous peoples.

Residential schooling contributed to the current health conditions and intergenerational trauma of Indigenous populations in Canada, such as poorer physical, mental and emotional, and general health outcomes in both the residential school survivors and their families (Wilk et al., 2017). With the loss in connection to land and culture, and the loss of intergenerational knowledge on food-related practices, there was a nutrition transition from traditional foods to a Western European diet (Fee, 2009). The introduction of store-bought foods and the reduction in traditional food acquisition has been detrimental to Indigenous health and well-being (Skinner et al., 2013). Coupled with climate change and environmental impacts from industry, there has been a shift in reliance from traditional foods to non-traditional foods to maintain food access (Lam et al., 2019). However, non-traditional foods are unreliable to acquire in more remote communities, and are expensive to access and purchase (Leibovitch Randazzo & Robidoux, 2019), as reflected upon by Clarisa:



Figure 20 Photo of asparagus in a grocery store  
Credit: Clarisa

*I love asparagus, but it's so darn expensive. I took a picture of empty shelves in Walmart one time, because the whole meat section was empty, empty, empty. It was such a profound scene for me. We have to wait for the truck to come in up here. When the shelves are getting bare, you know that they're waiting for another shipment. Anything that takes a certain amount of days, it's going to take an extra couple for us. (Clarisa)*

Colonial policies of assimilation and elimination sought to separate Indigenous peoples from their foodways and food systems, removing the right of many Indigenous peoples to culturally appropriate and nutritious foods. The white man's food is symbolically polluting and is seen as detrimental to general well-being (Schreiber, 2002). Western European knowledge systems has commodified natural remedies and traditional foods into packaged forms and synthetics. Darren shared his distrust of farmed meats:

*Steaks and roasts, and ground beef. One day, my mom brought it out. And I was like, What is that? Is that bear meat? Nope. Is that deer meat? No. What is that? And she goes, "Cow meat." And I looked at her and said, cow? Like, what do you mean cow? I don't know. My first cousin and I were always out hunting and getting something, Go get a bear, get a deer, get a seal or whatever. And we knew the techniques, fishing and everything.*

*I push that on my granddaughters and grandsons. [Wild meat] is not processed food. I said, you eat cow meat and they give them so many pills so they could live longer or grow faster and get fat faster. And then we eat them. And then there's a chemical reaction in the oil we use. I said you got to be careful. I'm not much for beef myself. I mean, I eat wild meats and stuff. Beef is like, hmm. I tell you, I had a steak one time. And I'm like, I don't like this. So, you know what I did? I boiled the heck out of it first, tenderized it, and I wrung it out, and then I fried it. I guess to kill everything, in my mind. (Darren)*

“Resistance to changes in the traditional relationship with the land is associated with individual well-being and notions of health and prosperity. Eating the right foods by following present-day traditional practices allows the past to directly shape how people constitute themselves both physically and culturally” (Fee, 2009, p. 375). Even though some traditional foods are not as easily accessible as they were in the past, they maintain symbolic power and political resistance that needs protection (Schreiber, 2002).

Colonialism has also affected how some Indigenous peoples conduct their day-to-day lives. The lack of time and the assimilation into a commodified and colonial society has caused people to prioritize things other than cultural teachings, leading to a cultural dissonance that eliminates the meaning tied to traditional practices. Desi reflected on today's fast pace of life:



Figure 21 Photo of a Pink Salmon near end-of-life  
Credit: Desi

*My dad taught me that death is a natural occurrence. He made sure a couple of us knew the signs of death and how to start preparing other family members. The next generations after me, I don't believe they were taught this. I would like to see a lot of those kinds of teachings coming back. But, I mean, it's just life, right? Everyone's just busy trying to make a living. You don't stop and think about; oh, this person needs to know this or this person needs to know that. My hope is to*



*help people slow down when it comes to moments like this and think about what needs to be taught. (Desi)*

In addition, assimilation into colonial society begets an increased cost to access cultural foods through traditional harvesting and foraging practices. The high cost of store-bought foods is prohibitive to food access, so the contribution of wild foods to Indigenous diets must be preserved for economic and cultural reasons (Leibovitch Randazzo & Robidoux, 2019). The average cost of getting on the land to harvest traditional foods is comparable to the costs of purchasing store-bought foods, illustrating a significant financial barrier to Indigenous food security (Leibovitch Randazzo & Robidoux, 2019). Desi shared her experience with acquiring oolichan grease and the associated costs:



*Figure 22 Photo of a jar of oolichan grease*  
Credit: Darren

*When my kids and I eat seafood, we will eat oolichan grease. As for kids in the community, I think it's relatively the same, it's changed a little bit. It depends because of low income. You don't always have the money to buy it. But if you can barter or you can provide some gas or give some money towards gas, then people will try to assist you with at least a couple fish. I'm not sure if they do the same thing with oolichan grease. It's a little harder to come by now that you have to pay, because it's not cheap. If you get a full quart jar that's anywhere from 80 to 100 bucks. (Desi)*

The impacts of colonization on Indigenous food systems, foodways, and food security and food sovereignty are systemic and widespread. Through systematic attacks on land, water, culture, bodies, and spirit, there is intergenerational trauma that inhibits traditional forms of knowledge sharing, food enjoyment, and food access (Fee, 2009; Grey & Patel, 2015; Leibovitch Randazzo & Robidoux, 2019; Schreiber, 2002). It is not in First Nations' culture to be poor, and it is important to realize that money alone cannot address the present day poverty inflicted upon Indigenous peoples by the settler-colonial structure (First Nations Information Governance Centre, 2020).

## **Chapter 5. Recommendations and Conclusions**

### **5.1. Recommendations**

In this study, the citizen scientists shared their lived experiences with their local food systems and the resilient strength that comes from leaning into their cultural roots, including the acknowledgement of the interconnectedness of oneself with one another and the natural world. For Indigenous self-determination of local food systems to occur, Indigenous peoples need to be recognized as knowledge keepers and as the hosts of the lands that were stolen from them. There also needs to be recognition of land as interconnected with people and as place that is culturally and socially important for food security (Coulthard & Simpson, 2016). The following are key recommendations for the field of planning to promote Indigenous food sovereignty and food security through the Indigenization of food system planning:

#### **5.1.1. Indigenizing the planning practice**

In terms of planning and policy making, the field of food systems planning needs to be Indigenized. An Indigenized approach to planning can play an important role in promoting food security and protecting important spaces and ecological sites. According to Hirini Matunga (2013), the “naming” of Indigenous planning needs to include, identify, and be contextualized to: 1) the links and associations with traditionally-prescribed custodial territory that an Indigenous group claims as theirs; 2) the concept of an accumulated knowledge system about place, history, values, and ethics; and 3) the existence of a culturally distinct set of practices and approaches for making decisions and taking actions. Solutions implemented and accepted in one Indigenous community cannot be assumed to work in another community, as the context surrounding the issues important to a community will differ.

The “Indigenizing planning role” must be filled by the local Indigenous community planner that has the lived experience (Herfan & Hemphill, 2013). Herfan and Hemphill (2013) argue that the local Indigenous planner will know about: 1) the interconnected relationships within a community; 2) the knowledge of cultural protocols and local

practices, and who to seek and ask about local knowledge; and 3) perspectives on symbolic issues and the community's vision on these issues.

Non-Indigenous ally planners can commit to decolonizing the planning practice by: 1) listening before speaking; 2) being flexible and open to the community's needs; and 3) committing to local capacity building (Herfan & Hemphill, 2013). Indigenizing and decolonizing planning can also contribute to reconciliation by fostering friendships with Indigenous communities that places the interests of Indigenous peoples at the forefront.

The Canadian Institute of Planners released a policy on planning practice and reconciliation (Canadian Institute of Planners, 2018), and adopted the Truth and Reconciliation Commission's definition for reconciliation: "the commitment to establish and maintain a mutually respectful relationship between Indigenous and non-Indigenous peoples" that is based upon principles of equality, partnership, and good faith. However, this definition fails to recognize the spatial connections between Indigenous peoples and the lands, further perpetuating the separation of humans from nature. Furthermore, the definition neglects to acknowledge the historical role of colonial planning in Indigenous oppression and erasure, or the potential for planning to contribute to reconciliation. For meaningful reconciliation to take place, there has to be clear action that works to resolve the numerous harms inflicted upon Indigenous peoples through Western planning practices. True solidarity needs to encompass a strong understanding and mutual respect for place-based relationships.

Planners can engage in decolonizing relations through practices that support Indigenous resurgence, ways to restore and regenerate Indigenous nationhood (Snelgrove et al., 2014) by moving away from state-based solutions (Cornthassel & Bryce, 2012). Resurgence refers to practices of Indigenous self-determination and cultural renewal, a taking back of Indigenous power in determining their own futures. It is important to mention that resurgence is entirely Indigenous-led and Indigenous-defined, but non-Indigenous planners need to be aware of it, to make space for it, and to support it in their practice.

The Kitselas First Nation has experienced differing opinions with the DFO which results in conflicts and restricted access to important food assets, such as the ability to harvest wild salmon (Lepofsky et al., 2017). The field of planning can and must evolve to account for food considerations and the right to food that extends beyond resource

extraction. There must be acknowledgement of place-based relationships and the vitality of certain foods to the survival of communities. A food systems planner has an opportunity to mediate conversations between First Nations and colonial governing bodies through advocacy and collaborative planning principles that encourages dynamic ways in solving conflicts and creating beneficial outcomes (Nagy, 2015). As suggested by Soma and Wakefield (2011), food system considerations can be implemented into planning through: 1) the compilation of data on community food systems, 2) analysis of connections between food and other planning concerns, 3) the assessment of current planning impacts on the local food system, 4) the integration of food security into community goals, and 5) the education of future planners about food system issues.

### **5.1.2. Two Eyed Seeing: Weaving of Indigenous and Western knowledge systems**

The planning profession and practice could greatly benefit from the integration of Indigenous and Western ways of knowing, offering opportunities for innovation. Herfan and Hemphill (2013) ask, “What if, for example, a plan was not only a 100+ page document, but was also expressed as a song or a painting?” (p. 21). Planners can look to the principle of “Two-Eyed Seeing” brought forward in 2004 by Albert Marshall, a Mi’kmaw Elder (Bartlett et al., 2012), which supports the weaving of Indigenous and Western knowledge systems. “Albert indicates that Two-Eyed Seeing is the gift of multiple perspective treasured by many aboriginal peoples and explains that it refers to learning to see from one eye with the strengths of Indigenous knowledges and ways of knowing, and from the other eye with the strengths of Western knowledges and ways of knowing, and to using both these eyes together, for the benefit of all” (Bartlett et al., 2012, p. 335). The concept of Two-Eyed Seeing enables Indigenous knowledge to exist as a distinct and whole knowledge system, and not as an afterthought or “consideration.” The utilization of Indigenous knowledge in planning contexts can help support Indigenous resurgence through revitalization of culture and language. Bartlett and colleagues (2012) note that there needs to be careful exploration of how Two-Eyed Seeing can be utilized in conjunction with mainstream thought to avoid misappropriation.

The provincial health system of British Columbia tends to operate from a sickness model when it could benefit from an approach that incorporates the First

Nations Perspective on Health and Wellness (Gallagher, 2019; O'Neil et al., 2016). Through the recognition and centering of Indigenous knowledge keepers in food and health planning and policy, the health system could shift from a reactionary model to a preventative model that incorporates more land- and water-based programs and services that reconnects Indigenous peoples with their traditional territories.

### **5.1.3. Centering Indigenous voices in planning and promoting community led and participatory approaches**

Through this citizen science-led photovoice process, it became apparent that community input and lived experiences are vital to identifying tangible and non-tangible culturally important food assets. Indigenous forms of knowledge have been historically misrepresented and excluded in Western forms of science and planning. “Western science has struggled, mostly unsuccessfully, to assess and develop solutions for complex, interdisciplinary environmental problems. These tools do not include culture or Indigenous knowledge, and, in some cases, there is no recognition of the validity of other knowledge forming approaches” (Marchand et al., 2020a, p. 59). Through the legitimization of citizen science and community-engaged research in planning practice, there can be a more thorough assessment of who is and who is not being represented (Soma et al., 2021). The inclusion of community voices can identify barriers to food access, food provisioning, and food harvesting practices that would not otherwise be recognized through a top-down planning approach. In addition, the inclusion of citizen scientists, stories, and photographs provides a contextual richness that illustrates the interconnectedness between material, meaning, and competence within local food systems.

### **5.1.4. Supporting capacity building and food literacy**

Citizen scientists identified the need for capacity building and infrastructure to improve local food security. As determined through a household survey conducted by the Nation in March 2020 (Kitselas First Nation, 2021), most community members are involved in preparing harvested resources such as smoking and canning salmon. More than half of the community members that participated in the survey said they gather plants, berries, or other tree products and participate in ceremonies or cultural events that use traditional

harvested resources. As reflected in the Kitselas First Nation Comprehensive Community Plan (Kitselas First Nation, 2021), there must be a financial investment in alternative food infrastructures and community gathering spaces that does not rely upon social assistance to improve local capacity. Suggestions for built infrastructures include the construction of physical spaces for traditional healing, food preparation, food growing, and food storage. Some of the citizen scientists also recognized the importance of getting people out on the land. To support traditional food access, there can be an organized system for community boat and vehicle rentals to access traditional territories, such as used by the Gwa'sala-'Nakwaxda'xw Nations (Herfan & Hemphill, 2013).

Indigenous knowledge is passed on from generation to generation, and the citizen scientists highlighted the importance of having more community members and youth involved in cultural practice. There needs to be more initiatives to teach people culturally important skills such as how to prepare and smoke fish through the fish camps led by Leanne and Fred, where to find berries, how to grow your own food such as through the community garden, and how to prepare plants for food and medicine. With resource lands management and resource stewardship being core areas of the Kitselas Lands and Resources department operations (Kitselas First Nation, 2021), there should be increased local capacity in animal and plant identification, mapping, and data analysis through workshops and educational programs. The teaching of these skills can help reconnect community members to the land and improve food security by increasing knowledge and awareness of wild foods that are safe for consumption while working toward greater self-sufficiency.

### **5.1.5. Integrating Indigenous food sovereignty into Canadian food policy**

This study sought to address and support several recommendations made by the Truth and Reconciliation Commission, including:

- 18:** Acknowledgement that the current state of Aboriginal health in Canada is a direct result of Canadian government policies.
- 19:** Identify and close gaps in health outcomes between Aboriginal and non-Aboriginal communities.

- 20:** Recognize, respect, and address the distinct health needs of Aboriginal peoples who do not reside on reserves.
- 22:** Recognize the value of Aboriginal healing practices and use them in the treatment of Aboriginal patients in collaboration with Aboriginal healers and Elders where requested by Aboriginal patients.

In alignment with the Food Policy for Canada (Minister of Agriculture and Agri-Food, 2019), this community food assessment photovoice work can contribute to and support five of the six aspirational outcomes proposed by the policy.

1. Vibrant communities,
2. Increased connections within food systems,
3. Improved food-related health outcomes,
4. Strong Indigenous food systems, and
5. Sustainable food practices.

This work will help increase capacity to improve Indigenous food security that is also in line with the policy's guiding principles of inclusion and diversity, reconciliation, collaboration, innovation, sustainability, and evidence and accountability.



## 5.2. Concluding Remarks

This study sought to illustrate how a citizen science-led photovoice process that is led by Indigenous peoples can better identify socio-ecologically important food assets, and how the centering of Indigenous voices in identifying food assets can better inform the field of food systems planning and food-related policy making. The approach of conducting a citizen science research allows a decentralization of power from planners and policymakers to citizen scientists. Treating Indigenous knowledge keepers as experts can improve a collective understanding of both the tangible and the metaphysical, the spiritual and non-tangible, and the interconnected relationships that shape local Indigenous food security (Rose, 2005). The use of practice theory highlighted the interconnectedness between Indigenous knowledge, tools and built and ecological infrastructures, and the emotional meanings and values associated with culturally important food-related practices. The findings show how Indigenous concepts of relationality and reciprocity are intertwined in cultural and food-related practices, which highlights the need for a holistic approach in planning.

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