

Feeding our Friends: an Assessment of the Prince Rupert Food System through a Social-Ecological Resilience Lens

**by
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Declaration of Committee

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Ethics Statement

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Abstract

As complex social-ecological systems with interacting human and environmental components, food systems are being impacted by climate change. In response, resilience is emerging as a key strategy in food systems planning, especially for northern and remote communities like Prince Rupert, BC, that rely on long-distance food imports. To better understand Prince Rupert's local food system and identify pathways to greater resilience, this research asks: what valued components are present in Prince Rupert's food system?; what weaknesses, strengths, and changes exist in Prince Rupert's food system?; and what are opportunities to improve Prince Rupert's food system? To answer these questions, this research conducted a baseline food systems assessment including valued component (i.e., food asset) mapping and applied social-ecological resilience as a framework to analyze data from focus groups and interviews with 15 residents. The findings from this study indicate that there are vulnerabilities in Prince Rupert's food system but also strengths and opportunities to build resilience.

Keywords: food systems planning, baseline food systems assessment, food asset mapping, food systems resilience, social-ecological resilience, Prince Rupert

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List of Acronyms and Abbreviations

BC	British Columbia
BC CDC	British Columbia Centre for Disease Control
CER	Community Engaged Research
CSA	Community Supported Agriculture
Ecotrust	Ecotrust Canada
HSDA	Health Service Delivery Area
JEDI	Justice, Equity, Decolonial Practices, and Inclusion
NCIL	North Coast Innovation Lab
NHR	Northern Health Region
NWFSI	Northwest Food Systems Initiative
OCP	Official Community Plan
SFU	Simon Fraser University
The City	The City of Prince Rupert
UNDRIP	United Nations Declaration on the Rights of Indigenous Peoples

Chapter 1.

Introduction

Food systems in Canada are being impacted by climate change. At a basic level, food production depends on a stable climate where rainfall and temperature patterns are regular and predictable (Kummu et al., 2021). While gradual changes like warming temperatures may benefit some regions by extending the growing season and increasing the diversity of suitable crops, there is a tradeoff as sudden changes like extreme events can ruin crops, damage soil, and put livestock at risk (Vermeulen et al., 2012). Additionally, extreme weather events can impact postproduction stages of the food system by making it more difficult to harvest, store, and transport food safely (Vermeulen et al., 2012). Combined, the slow- and rapid-onset effects of climate change are putting human health at risk through impacts to both food security and safety (Schnitter & Berry, 2019). Across Canada, each region is experiencing different impacts of climate change. Over the last five years, British Columbia (BC) has faced significant challenges including wildfires, flooding, and heat dome events that continue to affect how some communities access food (BC Centre for Disease Control, 2024). Within BC, coastal communities are under added pressure from climate change as changing ocean conditions disrupt the productivity and status of marine life (Boyce et al., 2023). These impacts are felt strongly by Indigenous communities, who depend on the ocean for food security and cultural connection (Whitney et al., 2020). In addition, coastal communities are often small and remote and rely on food that is transported large distances. By disrupting transportation routes, extreme weather events and natural disasters put the food security of many communities at risk (James, 2023).

To mitigate the impacts of climate change, food systems need to be more resilient. As social-ecological systems comprising interconnected networks of human and environmental components, food systems are vulnerable to many interacting shocks and stressors that can threaten key food system outcomes (Zurek et al., 2022). To be resilient, food systems must be able to withstand and recover from disruptions without impacts to food security. This is achieved through both reactive (e.g., absorb, restore) and preventative (i.e., build robustness) actions that increase capacity over time and across multiple levels (Tendall et al., 2015). As the world becomes increasingly

urbanized, urban food system resilience is emerging as a new challenge to overcome. In 2021, 89.5% of BC residents, or almost 4.5 million people, lived in urban settings (Statistics Canada, 2022b) where weak linkages between urban and rural areas have created food systems that are dependent on industrial food supply chains (Vieira et al., 2018). To prepare for and prevent the consequences of food supply disruptions, local governments are working to build resilience in their food systems through both emergency management and long-term planning.

When it comes to food system resilience planning, an important first step is conducting a baseline food system assessment, which reveals information about the status and components of a food system and provides essential data to guide policy-making and interventions (Baker, 2018; Soma, Shulman, et al., 2022). Because local food system resilience and security is influenced by the types, diversity, and redundancy of food assets present (Karoliina et al., 2023) a food asset assessment is a common type of baseline food system assessment that identifies and maps food assets in a community. Defined as “the local food infrastructure that maintains food-secure communities and regions” (Baker, 2018, p. 219), food assets include the tangible and intangible resources that support local food access, production, and distribution. While food asset assessments have been shown to result in positive changes in the food security of communities across BC (Ross & Simces, 2008), it is important that they are participatory and collaborative processes as many food assets that are essential to the food security of individuals or communities may be “hidden” and will not be accounted for unless community perspectives are included (Soma, Li, et al., 2022).

Traditionally, food asset assessments have focused on built (i.e., grocery stores, restaurant), social (i.e., community food programs, food sharing networks), and land-based food assets (i.e., farms, community gardens), while representation of ecological food assets (i.e., streams, berry patches), specifically those relevant to Indigenous communities, is lacking (B. Li et al., 2024). As such, food asset assessments are not always representative of the communities they depict. While the risks of misrepresentation can be reduced through the inclusion of marginalized voices, the assessment process has embedded barriers, from the language used to the fact that mapping is a colonial practice, that can discourage or limit the participation of minority communities (De Master & Daniels, 2019; Soma, Shulman, et al., 2022). In particular, while the term “asset” is used in food asset assessments to convey the value and

positive contributions of a community resource, it can also be interpreted as entities that can be owned, controlled, or managed, and as sustaining colonial ideologies (Soma, Shulman, et al., 2022). In an effort to decolonize food asset assessments, this study will refer to *food assets* as *valued components of food systems*, or *food system valued components*. This terminology is consistent with the language used in environmental assessments in Canada, which define *valued components* as components of the natural and human environment that are considered to have scientific, ecological, economic, social, cultural, archaeological, historical, or other importance (Environmental Assessment Office, 2013).

The intent of this study was to conduct a baseline food systems assessment, including the identification and mapping of valued components, for the City of Prince Rupert (the City) and to analyze the results through a social-ecological resilience lens. Funded in part by the City, this study was conducted to support food system planning in Prince Rupert and aligns with the food policies in the City's Official Community Plan (OCP; City of Prince Rupert, 2021).

This study is considered a community engaged research (CER) project, as it was co-designed by the City, whose needs and priorities are reflected in the research questions. CER is recognized as a valued research approach within social sciences for its ability to centre community voices, reduce inequities, and increase the relevance and impact of community-based research (Moczygemba et al., 2023; Wallerstein et al., 2020).

The focus of this study was framed by the following research questions:

- What valued components are present in Prince Rupert's food system?
- What weaknesses, strengths, and changes exist in Prince Rupert's food system?
- What are opportunities to improve Prince Rupert's food system?

Located on Kaien Island on the traditional and unceded territories of the Ts'msyen people, Prince Rupert is a northern BC port city surrounded by mountains and forests (Figure 1). Known as the City of Rainbows, Prince Rupert is one of the rainiest cities in Canada, experiencing between 17 and 24 days with precipitation each month

(Environment and Natural Resources Canada, 2024). As of 2021, Prince Rupert had a population of 12,300, of which approximately one third identified as Indigenous (Statistics Canada, 2023b). Prince Rupert is also the nearest urban centre for residents of several small to medium-sized communities, including Haida Gwaii, Maxlaxaala (Metlakatla), Lax Klan (Kitkatla), and Port Edward. Historically, Prince Rupert was a regional centre for fishing and forestry and was the site of the largest cannery in Canada. While Prince Rupert still receives a majority share of BC's commercial fishing catch, the economy is now focused on export logistics and shipping (Ahmed, 2019).

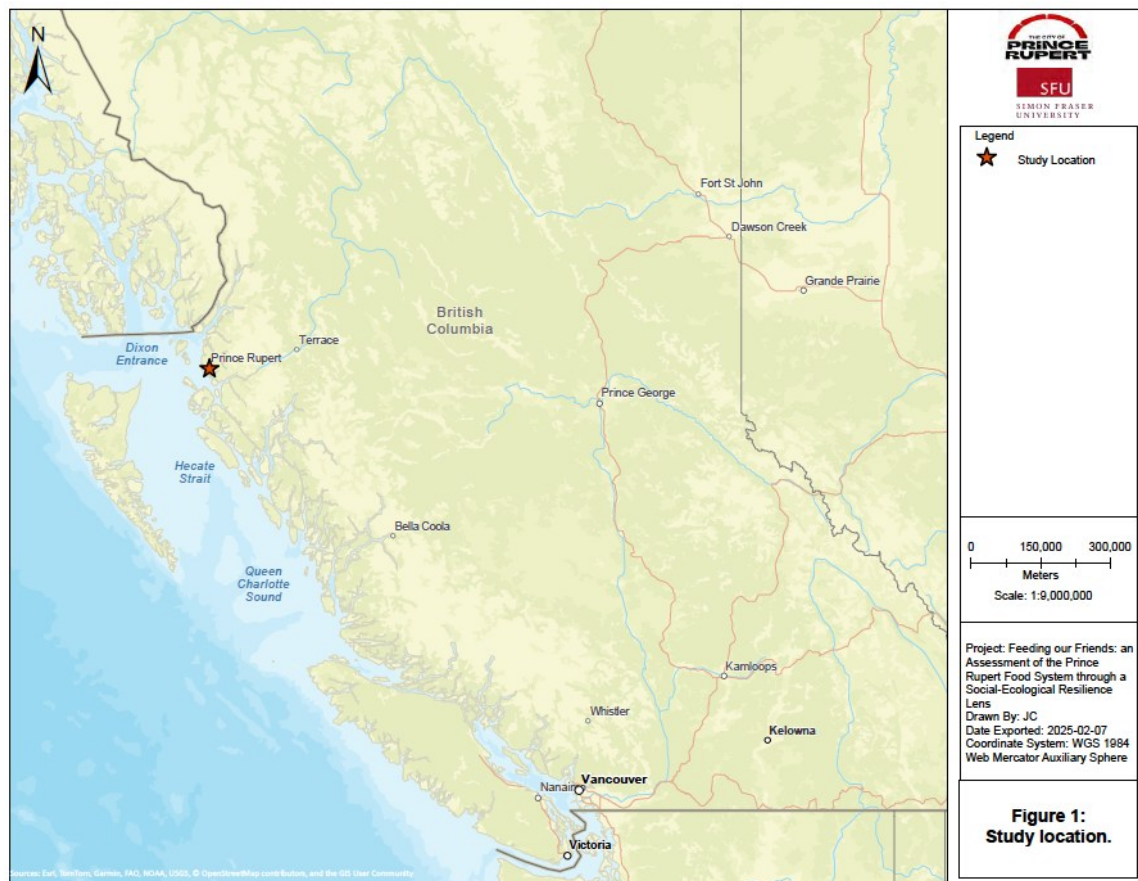


Figure 1. Study location.

While rapid population growth associated with increasing interest and activity at the city's port is a concern of the City regarding food security, so is climate change, which is anticipated to affect Prince Rupert in several ways. According to the draft *Prince Rupert Climate Risk and Vulnerability Report*, the top three climate risks for moderate and worst-case scenarios in Prince Rupert are tsunamis, flooding, and high winds (City of Prince Rupert, 2024). According to the report, Prince Rupert is anticipated to

experience more frequent and severe landslides and flooding caused by winter storms, resulting in adverse travel conditions, safety concerns, and damage to power lines and roads. Because Kaien Island has limited access points, road blockages or closures are a significant risk to food security (City of Prince Rupert, 2024).

Other factors that make food security and resiliency a challenge for Prince Rupert include the lack of a productive land base and the distance food must travel to reach them. With only eight farms in the entire North Coast Regional District (Statistics Canada, 2022a), agriculture in and around Prince Rupert is limited due to the presence of shallow bedrock, dense forest cover, and high annual rainfall (Grow BC, n.d.). In Prince Rupert, residents' access to local food¹ is limited to that produced through urban agriculture and subsistence harvesting, hunting, and fishing, which occur informally and at an unknown scale (City of Prince Rupert, 2021). As a result, the food security of residents depends on food imports, most of which travel 1,500 km on trucks from Metro Vancouver, which is the main food distribution hub for the province (Davies Transportation Consulting Inc., 2020).

The following Chapter (Literature Review) will provide an overview of social-ecological resilience theory, a brief history of food systems planning and the role of the planner, and provide context on the food insecurity experienced by northern communities, which provides the rationale and context for why this research is relevant. Chapter 3 (Methods) outlines the procedures and techniques used in the study as well as limitations. Chapter 4 (Findings) provides a breakdown of the study's findings in four categories: valued component mapping results, food system weaknesses, food system strengths, changes in the food system, and opportunities for improvement. Chapter 5 (Discussion and Recommendations) explores the impact of the study's findings by connecting them to potential planning and policy opportunities while responding to the study's guiding questions. Finally, Chapter 6 (Conclusion) will offer a summary of this study.

¹ In Canada, the definition of "local food" is food that has been produced in the province or territory in which it is sold and food sold across provincial borders within 50 km of the originating province or territory (Canadian Food Inspection Agency, 2023). For this study, local food is considered to be food that is produced within the North Coast Region.

Chapter 2.

Literature Review

2.1. Social-Ecological Resilience Theory

Considered a *boundary object* with multiple meanings and functions yet enough common ground to bring different opinions together through shared values or goals, resilience is a concept that is widely used and growing in popularity (Soubry & Sherren, 2022). Originating from a perspective of wanting to understand ecological systems, stability, and equilibrium (Holling, 1973), resilience has become an essential component of adaptation and mitigation to the social, environmental, and economic crises that are occurring across the globe (Béné et al., 2018; Leichenko, 2011; Stanley, 2020). When it first emerged, the concept of resilience was applied only to systems that could return to a steady-state point of equilibrium following a disturbance (Gunderson, 2000). While this idea of snapping back into place is appropriate for engineering systems, it does not translate well to social or natural systems that have zones of stability rather than single, static balance points (Cinner & Barnes, 2019; Davidson, 2010). Today, systems that adapt or transform in response to stress yet are able to maintain a “degree of normal functioning” are also considered resilient, despite undergoing a process of change (Cretney, 2014, p. 629). This version of resilience that centers adaptability is especially relevant to social-ecological systems, which take into account how all people, communities, and cultures are embedded within the natural world (Folke et al., 2016). Through a social-ecological systems lens, the wellbeing of people and the planet are considered interdependent, as almost every ecosystem in the world has been altered by people, and every person on the planet relies on the ecosystems and the services they provide (Lepp & Daly, 2022). Social-ecological resilience is therefore the capacity of social-ecological systems to adapt in the face of change, to re-organize, recover, and potentially try something new (Chapin et al., 2010; Cretney, 2014; Davoudi et al., 2012; Folke et al., 2016).

The concept of social-ecological resilience is especially relevant to food systems, which involve many interactions between human and natural components and operate across multiple spatial, temporal, and jurisdictional scales (Allen & Prosperi, 2016; Zurek

et al., 2022). While global industrial food systems are inequitable, unsustainable, and highly vulnerable to disruptions, they are also deeply entrenched, maintained by self-reinforcing feedback loops that resist change (Béné, 2022). This tendency to return to a stable state can be considered a form of resilience; however, the lack of capacity to learn, adapt, and transform is problematic. Unlike most social-ecological systems, food systems only have one desirable state. From an ethical perspective, unless everyone is food secure, the system is not functioning properly (Hodbod & Eakin, 2015). Because there are standards, rules, and expectations behind our understanding of a properly functioning food system, food systems are normative, meaning there is consensus on what state they *should* be in. While this clear dichotomy between functional and dysfunctional is unique to food systems, it highlights a feature of all social-ecological systems that is often overlooked: what encompasses a *desirable* state is subjective (Jones & McBeth, 2010; Walsh-Dille & Wolford, 2015). Power, politics, and values determine what is considered desirable and what is not, and the authority to make that decision is not equitably distributed (Davoudi in Davoudi et al., 2012). While it is tempting to see resilience as a universal force for good, the reality is that many social-ecological systems are not in desirable states and the status quo should not be maintained (Cretney, 2014). In fact, systems in undesirable states can be extremely resilient, as fear of negative impacts can impede innovation and trap systems in a state that is nearly impossible change (Cinner & Barnes, 2019; Hobdod & Eakin, 2015). For this reason, food systems resilience doesn't just require stability, it also requires sufficient, appropriate, and accessible food for all despite disturbances (Tendall et al., 2015). Food systems that return to a stable state where food insecurity persists are not resilient, they are stuck, and will be until they gain both adaptive capacity and the ability to transform (Folke et al., 2010; Walker et al., 2004).

Despite its widespread use as a defense against the uncertainties of climate change, there is little research on how resilience can support urban food security (Biehl et al., 2018). In the literature, resilience shows up as a framework through which interactions and outcomes in food systems can be anticipated and analyzed through both crisis response planning and long-term risk management (Barthel & Isendahl, 2013; Biehl et al., 2018; Toth et al., 2016). While it is not a perfect fit, the purpose of applying resilience thinking to food systems is that it defines mechanisms that help to achieve food security and provides insights on how to maintain the system in that state (Hodbod

& Eakin, 2015). In general, resilience can support food security by increasing the diversity of both the food system entities (i.e., producers, processors, distributors, retailers) and their responses to disturbance (Hertel et al., 2021). For example, a community will have a more secure food system if its food retailers have different suppliers, its restaurants serve a mix of locally- and globally-sourced foods, and its farmers use different techniques that produce a variety of crops. However, scale matters when it comes to food system resilience as different levels of governance will encounter different vulnerabilities and risks. On a large scale, resilience can generally be fostered through actions that promote redundancy and variety, support community capacity, increase social capital, and encourage decentralization (Cretney, 2014; Folke et al., 2016; Herrera De Leon & Kopainsky, 2019). When it comes to the resilience of individual communities, cities, or regions, actions should be place-based and targeted to address the local constraints (Hertel et al., 2021). While resilience is often reduced to emergency response with an emphasis on short-term damage reduction, it is also an important component of long-term planning (Davoudi et al., 2012). This is especially important for food systems, as making slow and steady progress towards reducing food insecurity is one of the most effective ways to build resilience (Biehl et al., 2018).

To move from resilience thinking to practice, theories must be applied through strategic plans that define what it means to be resilient and set priorities for how resilience can be accomplished (Sellberg et al., 2018). Tasked with protecting and enhancing community health and wellbeing (Blomley et al., 2023; Hansen et al., 2021), planners play a critical role in resilience planning. This responsibility is especially relevant in the context of food systems, which have profound impacts on the health and wellbeing of not just people, but the planet as well.

2.2. Food Systems Planning and the Role of the Planner

Despite the fact that the colonization of North America was achieved primarily through the establishment of agricultural systems, food systems planning has been largely absent from the planning agenda throughout recent history (Blomley et al., 2023; Pothukuchi & Kaufman, 2000; Soma & Wakefield, 2011). In the early stages of urbanization, agriculture and associated industries like food processing were removed from central cities, as they were considered rural domains and inappropriate uses of urban space (Pothukuchi & Kaufman, 1999; Vitiello & Brinkley, 2014). As early as the

1850s, food was travelling hundreds of kilometers to reach major urban centres, which had a significant influence on the development of national road and rail networks, but limited the scope of planners to zoning for food retail and coordinating food supply chains (Vitiello & Brinkley, 2014). During this period, food processors, supermarket chains, and public health professionals had bigger roles in shaping food systems than planners did (McMichael, 2006). As a result, food is largely ignored in planning literature, which focuses instead on physical planning, urban design, economic development, housing, and transportation (Agyekum & Awuh, 2024; Brinkley, 2013; Pothukuchi & Kaufman, 2000). Through the dichotomization of planning into urban and rural, cities and their residents were alienated from their food sources, and all of the work that was required to grow, process, transport, and distribute the food that ends up in the grocery store was made invisible (Clark et al., 2021). While planners have paid little attention to the food system, its links to land use, transportation, economic development, social equity, and health make it an important planning issue, deserving of both consideration and care (American Planning Association, n.d.; Fanzo et al., 2021; Soma & Wakefield, 2011).

It wasn't until the late 20th century when the social and environmental impacts of industrial agriculture and the risks associated with industrial food systems became better understood that planners took a more active role in the food system (Buchan et al., 2015). For many planners, this triggered an interest in the re-localization of food systems and a desire to create more sustainable food systems that reconcile for past social and ecological harms (Morgan, 2013). While agriculture and urban development remain competing land uses, planning trends that encourage interdisciplinary practice and mixed-use urban forms have provided planners with an opportunity to ease into food systems planning (Soma & Wakefield, 2011). Most planning departments do not have designated roles for food systems planners; however, there is increasing effort to integrate food systems considerations into the development and implementation of plans in other areas (Hansen et al., 2021; Soma & Wakefield, 2011). In particular, there is considerable cross-over between sustainability planning and food system planning, as food production, distribution, and consumption are intertwined with environmental, social, and economic sustainability (Béné et al., 2019; Issac et al., 2022). When it comes to food systems planning, municipalities take different approaches that vary from supporting established food policy councils or community groups to adopting proactive

and holistic local food strategies that provide a vision for the future food system (Schreiber et al., 2023). However, as food systems are generally not included in the formal curriculum for academic planning programs, the ability of many planners to participate in food systems planning is largely limited to supporting roles (Soma & Wakefield, 2011). Additionally, transformative change in a food system is often only achieved through a decades long process of incremental efforts, requiring long-term persistence, reinforcement, and resources (Buchan et al., 2019). Despite increasing awareness in the planning profession of the importance of food systems planning, the field is still in its infancy, and its absence for much of history has left a legacy that can still be felt in many neighbourhoods where access to healthy, affordable, and culturally relevant food is lacking (Battersby, 2017).

Today, many municipalities are turning their attention to local food systems in an effort to address concerns about the social, environmental, and economic impacts of industrial agriculture, and the potential for climate change to disrupt global food supply (Buchan et al., 2015; Issac et al., 2022). In its most basic form, local food systems planning is the identification of food system strengths and weaknesses within a community and the development of public policy to address challenges and opportunities (Growing Food Connections, n.d.). Often, local food systems planning centers around supporting the production and processing of food from within a specified geographic radius, as there is a general understanding that locally sourced food provides benefits that imported food does not (Enthoven & Van Den Broeck, 2021). However, scholars have been quick to point that localizing is not a solution for all food system issues (Buchan et al., 2015; Feagan, 2007; Stein & Santini, 2022). By labeling industrial food systems as bad and local food systems as good, planners risk justifying harmful local environmental practices and power dynamics (Campbell, 2004). In addition, locally sourced food is often more expensive than food sourced through conventional channels and is therefore, less accessible (Horst et al., 2017; Soma, Li, et al., 2022). For this reason, food systems planning cannot focus only on what is local and must also consider what is affordable, sustainable, and culturally relevant and balance any conflicts that may arise.

As conflicts in the food system involve many stakeholders and occur at the intersection of complex technical issues and deeply held values (Campbell, 2004), data are needed for planners to make informed and unbiased decisions. Often these data are

collected through food system assessments that are used to establish a baseline of information and set food system planning goals (Freedgood et al., 2011). While food system assessments range in scope from looking at the entire food system to a specific neighbourhood, a common feature is the identification of food assets, or valued components of food systems, which are the local food infrastructure that support community food security (Baker, 2018). Two important yet often overlooked components of food system assessments are the underlying values and systems of power. Values are present in the criteria that shapes community preferences and determines which valued components are identified and how they are defined (Jakes et al., 2015; Soma, Shulman, et al., 2022) while power dynamics determine who is engaged and how opinions are represented (Buchan et al., 2015; Leach et al., 2020; Williams et al., 2024). Given the significance of values and power in food system assessments, it is important for them to involve a component of community engagement that brings together diverse interests and makes sure that underrepresented voices are heard (Freedgood et al., 2011; B. Li et al., 2024). In addition, valued components of food systems that are essential to an individual's or group's food security may be hidden within the community, such as food sharing networks and traditional foods harvesting, and will remain unaccounted for unless the community is involved in the assessment (Soma, Li, et al., 2022; Soma, Shulman, et al., 2022).

While food system assessments can be powerful tools, they are not immune to criticism. Critiques of food system assessments include that they generally only consider colonial food resources (Curtis et al., 2024; Karetny et al., 2022; B. Li et al., 2024; Soma, Shulman, et al., 2022), they oversimplify complex food access issues by over-emphasizing certain indicators (De Master & Daniels, 2019), and they use terms (i.e., asset, resource) that are aligned with exclusively western worldviews that are not representative of more holistic values (Soma, Shulman, et al., 2022). The role of western ideologies in food systems research and practice is especially relevant in Canada, where colonization has eroded Indigenous self-determination and culminated in the loss of traditional food systems (Turner & Turner, 2008). Given that all of Canadian planning takes place on stolen Indigenous lands, food systems planning should be an act of decolonization that prioritizes justice and culture as much as it does nutrition and calories (Soma, Li, et al., 2022).

2.3. Planning for Remote Food Security and Resiliency

Across Canada, food insecurity is on the rise. Defined by Health Canada (2020) as the “inability to acquire or consume an adequate diet quality or sufficient quantity of food in socially acceptable ways, or the uncertainty that one will be able to do so.”, food insecurity is a consequence of coexisting social, economic, and systemic issues (United Way British Columbia, 2024). Food insecurity is a key public health issue in BC and is experienced by residents across the province at variable rates (N. Li et al., 2016). In a 2023 report prepared for the BC Centre for Disease Control (BC CDC), 1 in 8 people, or 12.5% of the population of BC (excluding children below the age of 12 and Indigenous peoples living on reserves) experienced some level of household food insecurity between 2017 and 2018 (BC Centre for Disease Control, 2023b). Within BC, the Northern Health Region (NHR), which includes Prince Rupert, had the highest rate of food insecurity at 1 in 6 people, or 16.6%. While income and economic security are primary determinants of a household’s or individual’s food security status, other contributing factors include living in a remote community, identifying as a racial minority, and having no legal immigration status (BC Centre for Disease Control, 2023b). While food security is greater for people living in poverty (i.e., household or individual income below the poverty line), BC has a disproportionately high and increasing percentage of people not living in poverty who are still food insecure (Statistics Canada, 2024). A possible explanation for this could be the cost of food and housing, which increased in BC by 27.7% and 40.1%, respectively, from 2018 to 2024 (Canada Mortgage and Housing Corporation, 2024; Statistics Canada, 2025). In BC, the highest food prices occur in the Northwest Health Services Delivery Area (HSDA), which stretches along the coast from Bella Bella to the Yukon border. In the Northwest HSDA, a nutritious food basket for a reference family of four cost an average of \$1,571 per month, which is over \$300 per month more than the provincial average of \$1,263 (BC Centre for Disease Control, 2023a).

Spread over almost two-thirds of BC, the NHR contains diverse geography and populations, including the highest proportion of Indigenous peoples in the province (Northern Health, 2022; Statistics Canada, 2023b). In Canada, Indigenous peoples are disproportionately affected by food insecurity (Domingo et al., 2023). A 2022 study showed that among Canadians who are not considered to be living in poverty,

Indigenous families living off reserve are more than twice as likely to experience food insecurity than non-Indigenous families (Uppal, 2023). Because Indigenous food security comprises aspects of both the market food system and the traditional food system, Indigenous peoples have unique food security considerations (Richmond et al., 2020). From a western perspective, food security is analyzed on individual, household, and community levels; however, Indigenous food security requires the consideration of a fourth level: cultural food security, which acknowledges the significant value of traditional foods in Indigenous culture and identity (Power, 2008). One of the main drivers of food insecurity among Indigenous communities is the loss of traditional food systems, which can be traced back to colonization (Domingo et al., 2023). Through physical displacement from their traditional territories, refused access to land, and involuntary institutionalization, colonial laws alienated Indigenous peoples from their traditional food systems and forced them to participate in a western food system that sought to starve and control them (Robin, 2019; Turner & Turner, 2008). The residential school system in particular had a significant impact on Indigenous diets as children were denied access to traditional foods, deprived of opportunities to learn about traditional food production, and removed from environments where traditional names for foods and the places they were gathered were shared (Turner & Turner, 2008). As a result, knowledge of traditional food sources, where to find them, and how to prepare them has largely been lost (Malli et al., 2023; Robin et al., 2021). Despite the fact that traditional foods are preferred components of Indigenous diets, they contribute a small fraction of what they used to, as most people do not have the time, skills, or resources to acquire food from the land (Trott & Mulrennan, 2024; Turner & Turner, 2008). Instead, most Indigenous peoples have adopted a primarily western diet that functions to promote health, but not wellbeing (Robin, 2019). While foods gathered from the land or bought at the store can both alleviate hunger, there is a deeper level of nourishment that is only provided by the connections to the land, social interactions, and reinforcement of cultural identity that come from participating in traditional food systems (Dennis & Robin, 2020). However, climate and environmental changes are making it more difficult to access traditional foods. From the pollution and contamination caused by industrial activities to the shifting seasons and migration patterns of wildlife, many Indigenous peoples have expressed concern about the availability and safety of traditional foods (Trott & Mulrennan, 2024). Simultaneously, many Indigenous communities experience challenges accessing market foods, as reserves are often small, remote, and underserved (Richmond et al., 2021).

While poverty is the largest cause of food insecurity globally, the physical availability of food is another contributing factor (Uppal, 2023). According to the Food and Agriculture Organization of the United Nations, food availability is one of the main dimensions of food insecurity, along with access, quality, and stability (Kakaei et al., 2022). In BC, the availability of food is largely determined by supply chains that can be thousands of kilometers long. Experts agree that BC's food system contains more than enough food for everyone, so when shortages occur, they are generally caused by problems with distribution, such as inefficient networks and logistical challenges (United Way British Columbia, 2024; Wakefield, 2021). Issues with food distribution have the largest impact on the food security of individuals living in remote communities, as they have access to fewer food options (Drysdale et al., 2024). While food distribution is susceptible to a variety of disruptions, climate change events that affect transportation routes are making it more difficult to move food around (Drysdale et al., 2024; James, 2023). In a 2022 study, residents of remote BC communities identified many determinants of their access to food, ranging from costs to physical availability (BC Centre for Disease Control, 2024). In remote communities, food is often unaffordable, as the prices are high and people have limited employment opportunities and sources of income (BC Centre for Disease Control, 2024). As such, food shopping often comprises a trip to the nearest urban centre with a large-format grocery store where food is more plentiful and affordable (BC Centre for Disease Control, 2022). However, this requires access to a private vehicle and the time to make the trip (BC Centre for Disease Control, 2024). Additionally, land- and water-based foods make up a significant portion of the diets of remote communities; however, hunting and fishing require licenses, supplies, and specialized modes of transportation and take time away from work or family responsibilities (BC Centre for Disease Control, 2024).

Given that remote and Indigenous community voices are underrepresented in research and policy, government initiatives have been unsuccessful at addressing the root cause of the issue (Drysdale et al., 2024). However, even though their food systems are not strong or resilient, remote communities often are, and despite the challenges they face, residents are filling the gaps with their own initiatives and generosity. While grassroots activities like these can increase the capacity of communities to thrive in the face of uncertainty (Daniel & Fernandes, 2024), planning and policies are still needed to provide a strong and durable foundation upon which a resilient food system can be built.

Chapter 3.

Methodology

This research followed the methods commonly used in published food system assessments in North America (Baker, 2018; Curtis et al., 2024; Freedgood et al., 2011; Jacobson, 2007; Maille, 2022; Pothukuchi, 2004; Provincial Health Services Authority, 2008; Soma, Li, et al., 2022; Uchanski et al., 2018). Key themes from the literature that informed this study include the importance of establishing goals and determining what the purpose of the assessment is, acknowledging the environmental and social context of the community, implementing an inclusive and intentional community engagement program, and connecting outcomes and recommendations to community needs.

3.1. Research Context

Over the past two decades, the Prince Rupert food system has been the subject of many studies and pilot programs. Leading most of the work has been Ecotrust Canada (Ecotrust), a Canadian charity with offices in Vancouver and Prince Rupert. With a focus on equity, justice, and sustainability, Ecotrust partners with communities to help them develop robust and successful place-based economies (Ecotrust Canada, 2024). Driven by the goal of building “economies that provide for life” (Ecotrust Canada, 2024, p. 8), Ecotrust includes food systems as one of their strategic priorities, as food systems are integral to health, identity, and culture but often do not meet community needs.

To address challenges and opportunities in Prince Rupert, Ecotrust established the North Coast Innovation Lab (NCIL), which operated between 2017 and 2020 and provided graduate students across Canada with opportunities to co-ordinate community-based projects and practice social innovation in the context of social, economic, and environmental resiliency (BC Public Service, 2024). Contributing towards Ecotrust’s goal of supporting “collaborative, vibrant, and innovative local food economies built by and for communities” (Ecotrust Canada, 2024, p. 22), the NCIL looked at ways to strengthen local food production and procurement in Prince Rupert through pilot projects and research on restorative ocean farming and urban agriculture. One of the outcomes of the NCIL was the Northwest Food Systems Initiative (NWFSI) that launched in 2021 with the

aim of strengthening Prince Rupert's food system through a demonstration urban farm (i.e., the Kaien Island Urban Farm), regenerative ocean farming, and a regional food trade network (Ecotrust Canada, 2023). While the NCIL and NWFSI were successful in highlighting many opportunities to advance food security and sovereignty in Prince Rupert, they also revealed key weaknesses that limit the uptake of innovative ideas. For example, while the Kaien Island Urban Farm demonstrated that it is possible to grow a lot of food in Prince Rupert and there is strong community support for locally produced items, the project was shut down after two years because of logistical issues including high staff turnover, disruptions from the COVID-19 pandemic, and the inability to secure long-term funding or a permanent site in town (Ecotrust Canada, 2023).

In addition to the NCIL and NWFSI, Ecotrust has partnered on other food systems initiatives and research in Prince Rupert and across BC. One of their main areas of focus has been on the sustainability of the fisheries, seafood, and marine products industries (Bennett et al., 2020; Ecotrust Canada, 2009; Ecotrust Canada & T. Buck Suzuki Environmental Foundation, 2018). Ecotrust has also collaborated on the development of an Equity Planning Tool for Community Food Systems that focuses on Justice, Equity, Decolonial Practices, and Inclusion (JEDI). The tool was developed through community-engaged participatory research in Prince Rupert that involved unpacking common myths about food system issues and identifying and mapping power dynamics in the food system (Dring et al., 2024). As a result, there is a wealth of information about various facets of Prince Rupert's food system and numerous resources for policymakers when it comes to local food security, sovereignty, and equity. However, due to the extent of food systems-based research that has occurred in Prince Rupert within the last decade, there is a growing sense of engagement fatigue from community members, who have participated in many studies but are yet to see any real change as a result (Ecotrust Canada, 2023).

In addition to the external research conducted on the Prince Rupert food system, there are also pockets of strong enthusiasm and support from within the community. This is highlighted through the various community-based food system initiatives that have taken place in Prince Rupert over the last five years, including TED-style talks about food sustainability; roundtable discussions about food security and sovereignty; and community engagement sessions about food system security, justice, and resilience. Run by Rupertites for Rupertites, these events were hosted by local

organizations including the Salvation Army, the Lester Centre of the Arts, Ecotrust, and the Metlakatla Stewardship Society.

In Canada, there are multiple federal and provincial ministries or agencies that provide funding and supports for food systems work. These include Agriculture and Agri-Food Canada, the BC Ministry of Social Development and Poverty Reduction, the BC Ministry of Agriculture and Food, the BC Ministry of Health, Northern Health, and the First Nation's Health Authority. While many grants are aimed towards agriculture and food production, an increasing number target Indigenous food sovereignty, food infrastructure, and climate resilience/emergency preparedness. In Prince Rupert, the City has received funding from the BC Ministry of Social Development and Poverty Reduction for food systems transformation initiatives, but because the focus on food security is relatively new among city staff, they have limited experience with other organizations. It is important to note that while there is funding available, there are no provincial or federal food system strategies in Canada that guide local policy efforts. As a result, neighbouring jurisdictions often have different food system policies and areas of focus, which can make regional cooperation difficult (Robert & Mullinix, 2018).

3.2. Research Design and Methodology

3.2.1. Community Engagement

This study obtained research ethics approval from the University Research Ethics Board of Simon Fraser University in April 2024 under the title "Prince Rupert Food System Assessment - Community Perspectives". The participants targeted for this study were residents of Prince Rupert and/or those knowledgeable about the Prince Rupert food system. Participants were recruited primarily through referrals from experts in the community. Participants were recruited over email and were asked to share the invitation with others who met the study criteria. There was a conscious effort to ensure that a diversity of voices was included as study participants (see further comments in the limitations section).

Two focus groups were held at the Civic Centre in Prince Rupert – one on June 20, 2024 and one on June 22, 2024. The focus group on June 20 had four participants and the focus group on June 22 had eight participants. During the focus groups,

Project: Prince Rupert
System Assessment
Data Exported: 2024-0
Drawn by: JC
Coordinate System: WGS
Mercator Auxiliary Sphere

Scale: 1:1
0 250 500
Miles

Map labels and notes:

- WILMANSKANCAUD
- McBride St
- Prince Rupert Golf Club
- Civic Centre
- Prince Rupert
- Rupert
- Kittatia
- Port Edward
- McHale
- Scallop Farm
- Fruit Trucks inconsistent
- Order blueberries from Maids Gwaii
- Bulkley Valley Wholesale (Smithers) - restaurants use
- Jand F / 6 F?
- Sikh Temple
- Community Garden
- Salmonberry bushes
- Cookie creations
- Rupert
- Cook-a-rook (delivery) online
- Spice (delivery)
- Friendship House
- Senior's Centre
- Scarfairs Mission
- Rod and gun club
- Messy bun (bakery)
- Out of town farmers/producers used to come and park at Civic Centre but now they charge money and park at Dolly's now
- Selling South Cakes
- Tannuki
- Asian Fusion Food Truck
- Food Truck
- Redneck Kitchen
- Food Truck
- Spices
- Sauces
- Honey Lady - Rushing River
- Lunch Lady
- Dai's Market
- Kaleidoscope
- Speckled Soda
- Bis - mostly
- W diamond ranch
- Buttaro guy? (facebook)
- Maiti Fila
- Yokindas
- Cakes / Lunches

Following the mapping exercise, participants were led through a discussion about their experiences with the Prince Rupert food system. The discussion was semi-structured and guided by questions that were designed to gain a better understanding of the current state of the food system, including access and equity, strengths and weaknesses, cultural and social dimensions, and opportunities for improvement (Appendix A). Discussion questions were designed to avoid using the terms “food assets” to avoid ambiguity and the exclusion of land-based or cultural components or community networks. Instead, questions focused on how participants access, interact, or share food within their community and the barriers they currently face. The discussions were recorded with voice recorders.

As several individuals were unable to attend the focus groups, three follow-up interviews were conducted in October 2024. Interviews were conducted online via Zoom and were recorded onto a computer hard drive. Each interview was on average 1 hour. The interview questions were the same as the focus group discussion questions, with the exception of the removal of the mapping exercise. Instead, participants were asked to share information about where they get their food from. All participants – both of the focus groups and interviews – were sent the questions ahead of time and were offered a modest honorarium for their time.

Each of the 15 study participants are at least part-time residents of Prince Rupert or surrounding communities. Participants included gardeners, urban farmers; foragers, harvesters, and hunters; representatives of local environmental non-profits, charitable organizations, local fisheries, and the school district; restaurant and food industry workers; health care workers; academics; members of local First Nations communities; and recent immigrants; though, many participants fit into multiple categories.

Recordings from the focus groups and interviews were transcribed using Otter.ai and coded using NVivo software. Responses were coded using a blended approach of deductive and inductive coding methodologies. For deductive coding, codes – which are words or themes that represent larger ideas – are pre-determined based on existing theory or research questions, while inductive coding develops codes directly from the data (Bingham, 2023). Before coding, broad categories were pre-defined according to the research questions (i.e., weaknesses, strengths, changes, ideas/opportunities). Once the data had been organized into these categories, inductive coding allowed for the identification of sub-themes that captured participants' authentic perspectives (Figure 3). In the literature, this process of cycling between deductive and inductive coding is encouraged, as it allows researchers to maintain a theoretical focus while staying open to new ideas (Skjott Linneberg & Korsgaard, 2019). To preserve anonymity, the names of the participants were removed during the coding process.

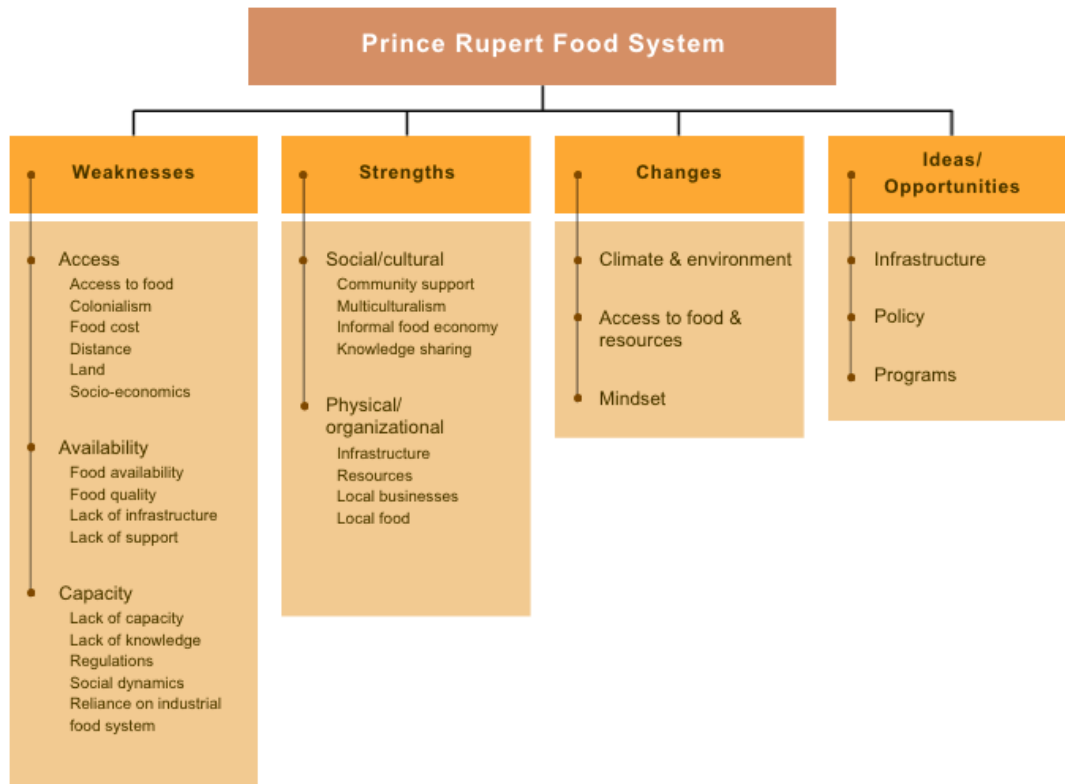


Figure 3. Coding of the themes from the focus groups and interviews.

3.2.2. Food System Valued Components Mapping

To map food system valued components, an expert in the community was recruited to provide a list of active food infrastructure in Prince Rupert. The list included the names of current food retailers in Prince Rupert along with the type of service they provide (i.e., restaurant, grocery store, food pantry, etc.). A desktop search was then run on each valued component to obtain location information including street address, latitude, and longitude. Results were cross-referenced with publicly-available maps (i.e., Google Maps) to ensure accuracy. The location data were entered into a spreadsheet that was imported into ArcGIS Pro. Data was loaded as a point layer using the latitude and longitude fields to define the spatial coordinates. A suitable coordinate system was applied (i.e., WGS 1984) to ensure geographic accuracy. Points were then symbolized according to type (i.e., built, land-based, social). As some food system valued components do not have a fixed or publicly available address (e.g., homebased food delivery, harvesting/fishing/hunting/foraging sites) they are excluded from the maps.

3.3. Limitations

There are a variety of limitations to this study. Firstly, despite their prominent role in the local food system, representatives of large grocery retailers and food suppliers chose not to participate in the study. Their perspectives on the local food system would be useful in future studies. Further, the individuals, businesses, and organizations contacted were not an exhaustive list of suitable participants. In conversations with local experts, it was decided that recruitments efforts should focus on groups and individuals who are active in the food system; however, because participants were selected based on social networks, not random sampling, the results of the study may be biased.

While more than 50 requests to participate were distributed, the low response rate is likely attributed in part to engagement fatigue, given the abundance of food system-related research that has been conducted on and within the community. Given that this study had few resources (i.e., limited funds, a deadline to complete the research), community outreach and recruitment efforts were limited and, despite the low turnout, it was not feasible to conduct additional focus groups. Resource constraints are a viable justification for small sample size, as any data that increases knowledge or fills a gap has value, no matter how limited (Lakens, 2022). Even findings with a single case study can offer important insights, particularly when they inspire future research (Boddy, 2016). In addition, most studies that employ interviews reach data saturation (i.e., capture all key themes) with a sample size of 12 (Guest et al., 2006).

Additionally, although there were a variety of attempts to diversify the participants, few were of minority groups and only two identified themselves as Indigenous. Given that over a third of the population of Prince Rupert identifies as Indigenous (Statistics Canada, 2023a), this is considered a significant limitation.

Finally, the researcher's positionality has influenced the outcomes of the study. As a settler of European descent engaging in Western science-based research, the researcher's worldview determined both which methods were used and how the results were framed (Darwin Holmes, 2020). Specifically, the researcher's scientific background, outsider perspective on the community, and personal feelings about colonial legal systems are considered to have impacted the study design, interpretation of results, and development of recommendations.

Chapter 4.

Findings

The following sections outline the results of the community food assessment and mapping exercise and the weaknesses, strengths, changes, and opportunities that Prince Rupert residents identified in their local food system. These findings showcase the complexity of Prince Rupert's food system, which is considered in the context of social-ecological resilience in the Discussion (see Chapter 5).

4.1. Overview of Valued Food System Components

A total of 163 valued food system components were identified in the Prince Rupert food system (Table 1; Figure 4; Figure 5). The location of the valued food system components varied from within Prince Rupert to 1,475 km away in Burnaby, BC. Valued food system components located outside of Prince Rupert and the surrounding communities (i.e., Maxlaxaala, Lax Klan, Port Edward) include out-of-town vendors who bring meat and/or produce into Prince Rupert regularly and wholesalers that supply restaurants and grocery retailers in Prince Rupert or that residents order bulk shipments from.

Table 1. Valued Components of Prince Rupert's Food System.

Category of valued component	Number identified
Built	90
Land-based	26
Social	23
Ecological	20
Multiple	4

Of the 163 valued food system components in Prince Rupert, 90 are built (i.e., 55%), of which 36 are restaurants and 19 are grocery retailers. Of the grocery retailers, only two are large chain full-service grocery stores, both of which are owned by the Pattison Food Group. The remainder are specialty stores that carry a limited selection of products (3), retailers with partial grocery selections (4), independent grocers (1), seasonal markets (2), convenience stores (6), and gas stations (3). Also within the built category are 11 home-based online food delivery businesses that are considered “hidden” as they would not have been known about without community engagement. Because they do not have storefronts and owners do not make their home addresses available to the public, online food delivery businesses are not shown on the map.

The majority of the land-based valued food system components are out-of-town vendors who come into Prince Rupert as little as once or twice a year. These 14 vendors bring in produce and meat from independent farms and generally sell items from trucks in large quantities that customers pre-order (e.g., half a cow). Other land-based valued food system components include community gardens and various forms of urban agriculture (e.g., backyard chickens, beehives). There is only one farm in Prince Rupert, which is spread over two and a half privately-owned parcels and a section of a municipally-owned waterfront industrial parcel. Half of the food produced at the farm is distributed through a community supported agriculture (CSA) model to 25 subscribers and the other half is donated to the local food bank.

Of the social valued food system components, the majority are organizations that offer meal programs and those that provide free meals. Other social valued food system components include the food bank, shelters and treatment centres², and the Metlakatla Food Fish Program that supports Metlakatla fishers and distributes fish to the community.

Ecological valued food system components comprise 10 terrestrial and 7 marine wild foods that can be obtained through foraging, harvesting, fishing, or hunting and three docks where seafood landings are made. As ecological valued food system components are widespread in and around Prince Rupert and specific

² While shelters and treatment centres also offer meals, they are considered separate from free meal programs as the main purpose of the organizations is to treat addictions and the meals are not open to the public.

foraging/harvesting/fishing/hunting sites can have cultural or personal significance, the location of these valued components (apart from the docks) has not been shared.

Four valued food system components are classified as belonging to more than one category. Most have a built component (e.g., restaurant) and a social component (e.g., community kitchen), or a built component and a land-based component (e.g., greenhouse) and are part of a growing trend of business diversification.

While many individual valued food system components were identified, participants also discussed how almost all the food in town can be traced back to the two major grocery stores and their suppliers. As one long-term resident stated:

You take all these, and they're like, secondary food sources, and then the trail goes back the Safeway, the Save-on-Foods. You know, the two or three food distributors. That's basically all that's coming in. (Participant 2)

This is particularly relevant to the social valued food system components, as their role is to provide community support and fill gaps in food access and availability; however, they also rely on imported supplies.

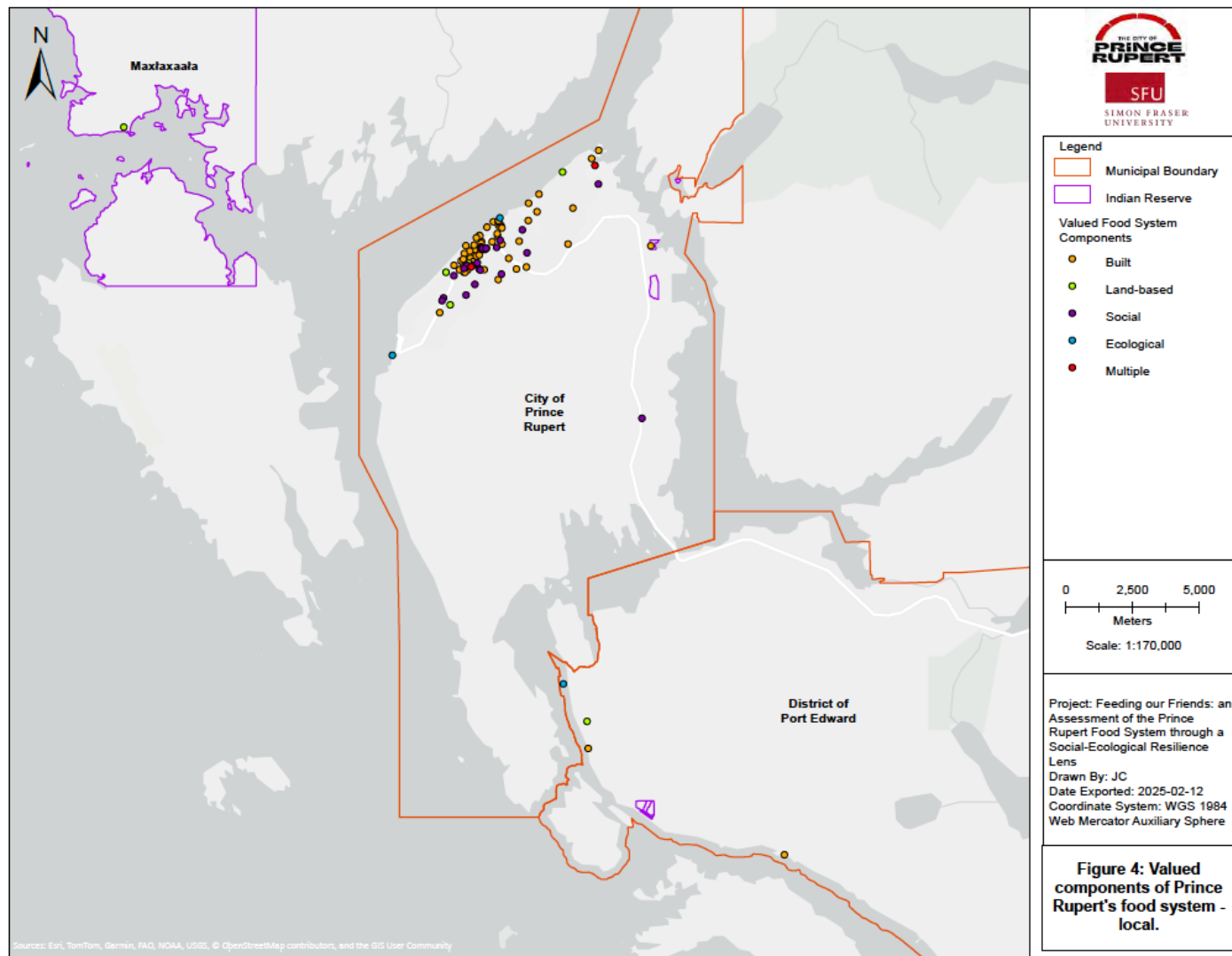


Figure 4. Valued components of Prince Rupert's food system – local.

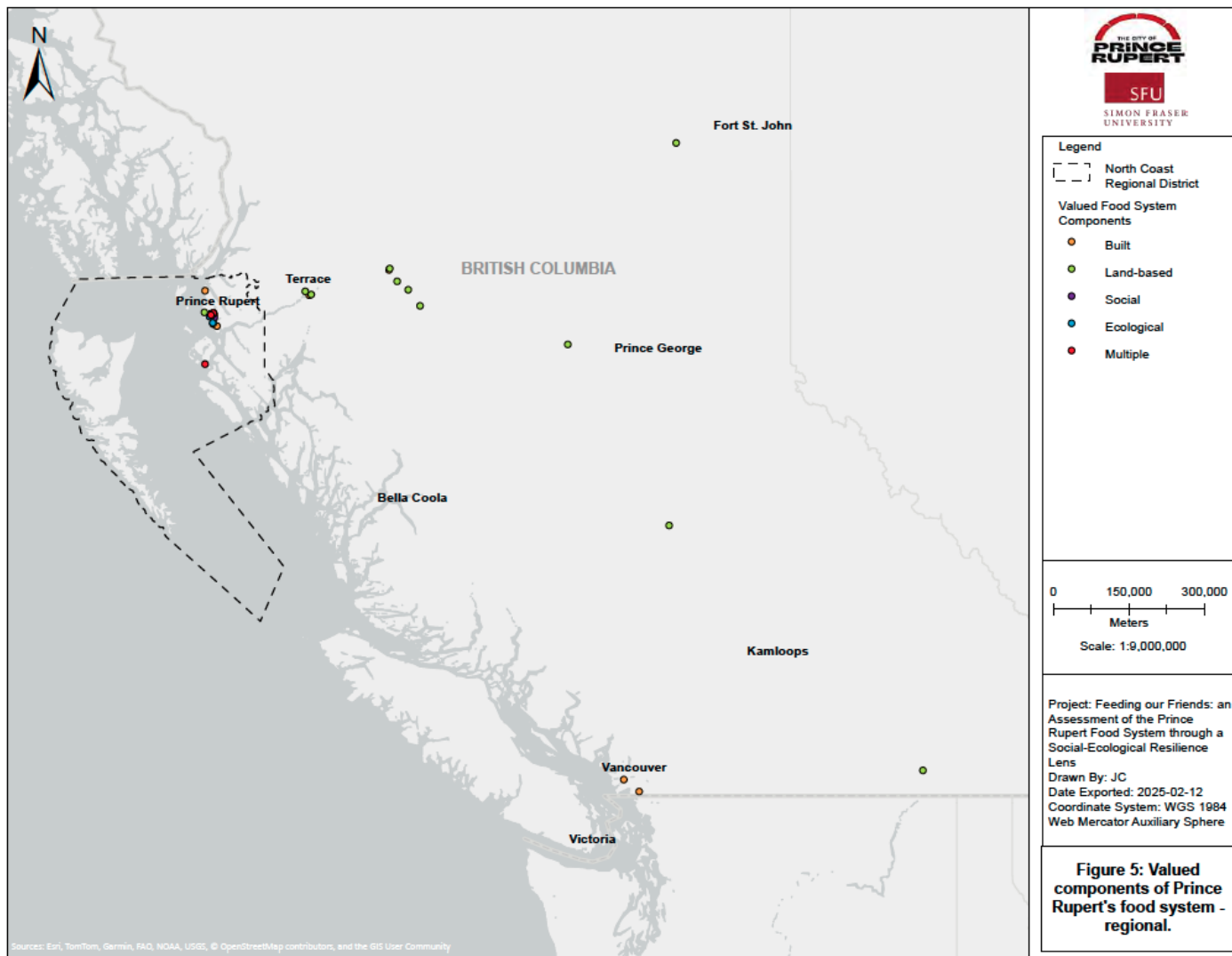


Figure 5. Valued components of Prince Rupert's food system – regional.

4.2. Food System Weaknesses

The discussion of weaknesses in the Prince Rupert food system dominated the focus groups and interviews and resulted in the identification of 117 different gaps and barriers. While many different food system weaknesses were identified by the participants, three main themes emerged: access, availability, and capacity (Figure 6).

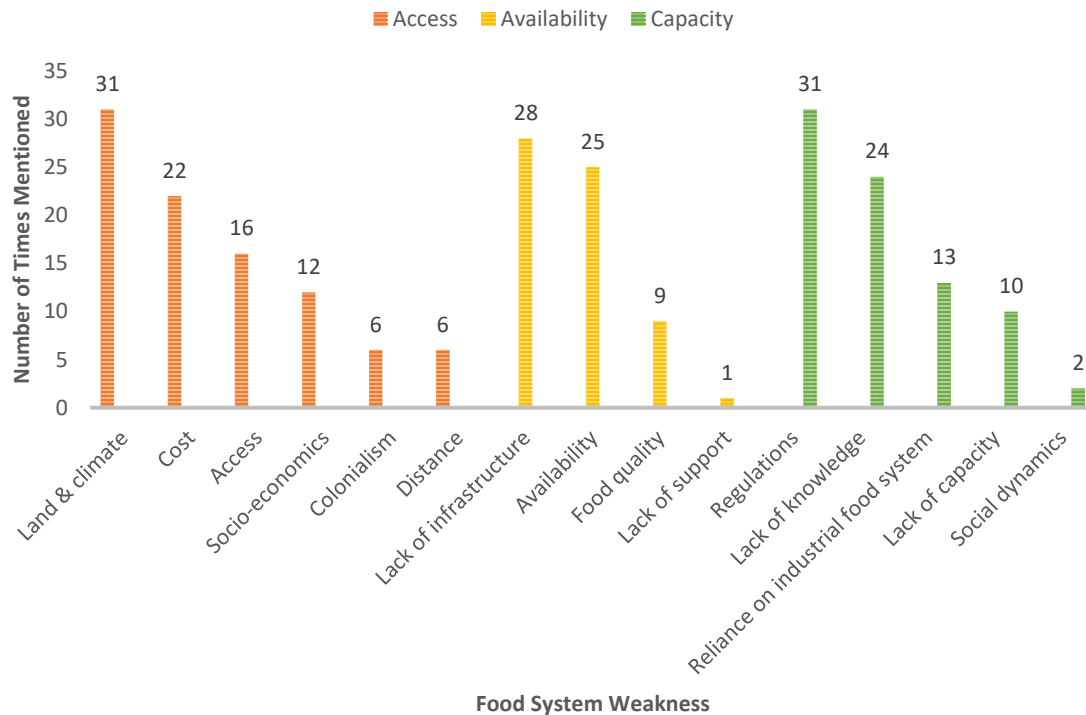


Figure 6. Frequency of food system weaknesses mentioned in focus group discussions and interviews.

4.2.1. Food Access Barriers

Barriers to food access include physical access barriers, the impacts of colonialism on Indigenous food sovereignty, the cost of food, Prince Rupert's distance from other urban areas, the limitations of the land and climate, and socio-economic factors. Of the access barriers, land and climate limitations were the most frequently mentioned (i.e., 31 times), ranging from the lack of suitable soil for gardening to concerns over contaminated water in the harbour. While many participants garden, they agreed that gardening in Prince Rupert is more difficult than in other places and requires

skills, knowledge, and patience. As one participant with experience growing food commercially stated:

I was a gardener, but to get to where I am now, I had to completely throw out everything I knew and completely redo things. It takes a whole different mentality.

(Participant 4)

The ability to adopt this “mentality” is also considered a barrier, especially to people who work full-time and do not have the time or energy to invest in the trial and error that gardening requires. Additional limitations to gardening include the abundance of pests (e.g., deer, voles, marmots, rats, stray cats) and how most properties in Prince Rupert are small and “cramped in”.

The second most frequently mentioned barrier to food access (i.e., 22 times) was cost, encompassing the price of store-bought food as well as the expenses associated with gardening and accessing wild foods. While all groceries in Prince Rupert are more expensive than in nearby cities like Terrace, locally caught seafood is the most unaffordable and is only available at specialty stores. Beyond food prices, socio-economic factors such as employment opportunities, income levels, and rent costs were also discussed in the context of food affordability. Poverty – particularly among children and youth – was highlighted as a significant barrier to food access in Prince Rupert. Participants with connections to the school board described a “high degree of food insecurity among the student population”, noting that school meal programs are often the only source of food for many children each day.

A notable physical access barrier to food is how certain foods are basically inaccessible unless you know the right people. Local seafood, for example, is most readily available to those who fish themselves or have connections to someone who does. As one newcomer to the community explained:

When I first moved here, I asked people how I can buy local fish. And they said, well, you just have to know a fisherman. (Participant 9)

This perspective illustrates the importance of friends, family, and neighbours in Prince Rupert when it comes to food access, particularly of wild foods. Because building

a network takes time, newcomers often have reduced food access compared to long-term residents.

4.2.2. Gaps in Food Availability

Gaps in food availability in Prince Rupert include both foods available for purchase in stores and wild foods obtained from the land. Factors that influence the availability of food in Prince Rupert include the physical availability of food in stores or wild foods on the land, food quality, food-supporting infrastructure, and provincial/federal supports. Of the gaps in food availability, a lack of food-supporting infrastructure was most frequently mentioned (i.e., 28 times) and came up in discussions almost as much as all the other food availability gaps combined (i.e., 63 times). Food-supporting infrastructure that is considered to be lacking in Prince Rupert includes community-based seafood processing facilities, a composting facility, and a laboratory testing facility for shellfish. While there are several seafood processing facilities near Prince Rupert, almost all of the fish they process is exported out of the community.

The fact that there is only one road in and out of Prince Rupert also came up frequently in discussions about food availability. The long distance that food travels to reach Prince Rupert and the limited accessibility of the town is considered to affect both the quality and quantity of food available. Participants mentioned how the availability of store-bought food is inconsistent due to the long supply chain and that shortages are common, especially in the produce section. When fruits and vegetables are available, they are often not the best quality, due to the time spent in transit.

The next most frequently mentioned gap in food availability (i.e., 22 times) was the physical availability of food in stores or wild food on the land. Most discussions about this centred around how there is almost no BC produce or local seafood available in grocery retailers and how the organic section has almost disappeared. Conversations about local and organic food often circled back to the costs. As one participant stated:

If people actually bought organic food, they would sell organic food. But they don't, because no one's buying it. Why? Why is no one buying it? Because they can't afford it. (Participant 8)

Local seafood is viewed similarly. Participants discussed how local seafood can only be purchased at one or two stores in town and how the costs are prohibitive for most households. While there is interest in buying seafood direct from fishers, Prince Rupert lacks the social infrastructure needed to support this. Because there are no programs or established networks to connect fishers with consumers, those who wish to sell locally must build their own customer base and manage sales, which takes time and effort away from fishing. As a result, most fishers opt to sell to processing facilities, where they have a guaranteed buyer and the flexibility to set their own schedule.

4.2.3. Gaps in Capacity

When it comes to the capacity of Prince Rupert's local food system, regulations were the most frequently mentioned challenge (i.e., 31 times). Comprising city bylaws, food safety laws, and licensing requirements, the regulatory environment is considered to limit the capacity of the local food system by making it difficult for people to participate in the food system as more than consumers. As a coastal town with a marine-based economy, Prince Rupert is strongly affected by federal policies, especially those that regulate the fishing industry. Participants of the study with ties to the fishing industry criticized the Canadian fishing licensing model (i.e., individual transferrable quotas) for its role in the decline of locally owned and operated fisheries. Another criticism is that different licenses get different access to fish and that charter and recreational fishing specifically are taking a lot of fish away from the community and are insufficiently regulated. Local regulations are also considered to affect the capacity of the local food system. Certain city bylaws – such as those that require permits for greenhouses, restrict fence height, and prohibit backyard chickens – are seen as creating barriers to self-sufficiency.

After regulations, the next most frequently mentioned gap in capacity (i.e., 24 times) was a lack of knowledge, primarily related to successfully growing food. The main challenge is that people do not generally know what grows well in Prince Rupert. Even plants that are suited for the correct Hardiness Zone will not necessarily grow well in Prince Rupert because of the soil and climate. In addition, lack of knowledge about composting was also cited as a barrier to growing food, as there are no municipal programs or compost facilities. Other areas that residents lack knowledge in are city bylaws and regulations; what wild foods are safe to eat, where to access them, and how

they can be sustainably harvested; and what local resources are available to them. As one participant explained:

Going over all of this information, a lot of it isn't necessarily readily available. I've been in town for three years and it's still like, Oh, this is new. Oh, this is new. There's things that you just don't learn. (Participant 2)

Most local food initiatives in Prince Rupert are grassroots efforts – such as Facebook groups organizing seed exchanges or community organizations hosting dinners at one of the halls – that are advertised through social media or word of mouth. Because the City lacks a dedicated sustainability coordinator, there is no centralized effort to promote these events or reach underserved communities. At present, municipal staff and city council members who work on food-related projects or programs do so “out of the side of their desk in their free time”, driven by their personal passion for the cause.

4.3. Food System Strengths

While participants identified fewer food system strengths than weaknesses (i.e., 39 strengths compared to 117 weaknesses), they were discussed much more enthusiastically. The strengths of Prince Rupert’s food system fall into two main categories: social/cultural and physical/organizational (Figure 7).

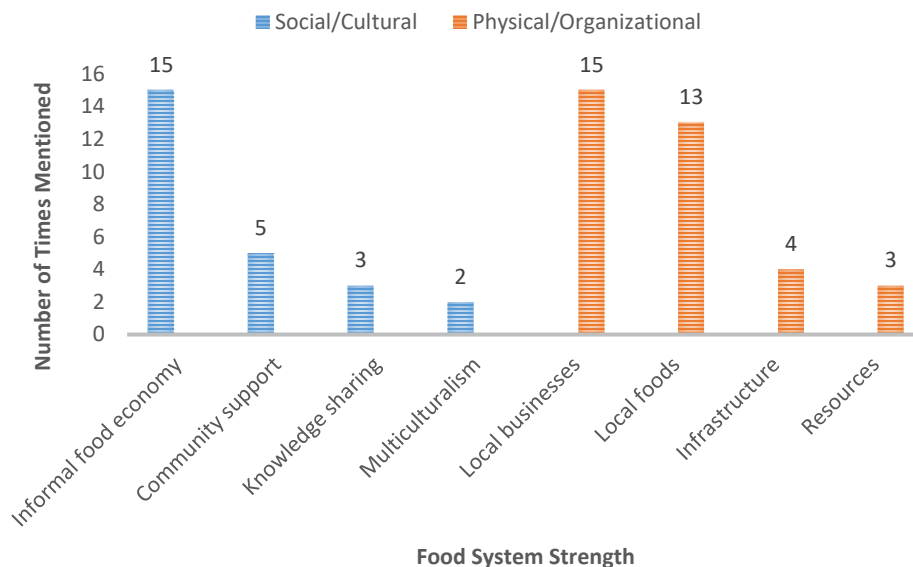


Figure 7. Frequency of food system strengths mentioned in focus group discussions and interviews.

4.3.1. Social/Cultural Strengths

Social/cultural strengths were mentioned 25 times during the focus groups and interviews and encompass the intangible components of Prince Rupert's food system that are celebrated in the community. When asked about the strengths of Prince Rupert's food system, participants eagerly highlighted community support, multiculturalism, the informal food economy, and knowledge sharing as key positive aspects. The most frequently mentioned social/cultural food system strength (i.e., 15 times) was the informal food economy, which has developed through widespread practices of trading, sharing, and selling food through unofficial channels. While the networking component of the informal food economy was mentioned above as a barrier to food access, the informal market is considered to increase food access far more than limit it. In Prince Rupert, the informal food economy is the only way that certain foods – such as local seafood, wild game, wild berries, shellfish, and kelp – get onto people's plates. However, due to restrictive food safety standards and regulations, most of these transactions are occurring despite certain prohibitions. Even so, food sharing networks in Prince Rupert are thriving. As one participant stated:

If you did a show of hands, who's bought illegal sockeye salmon from some local food fisherman, it's gonna be, you know, a nine or 10 to one. (Participant 6)

This perspective also underscores how having Indigenous connections can further increase access to food. Evidence of this can be found in the number of settlers in Prince Rupert who have home canned salmon in their cupboards – a food item that is rare outside Indigenous communities.

Another strength of Prince Rupert's food system is the strong community support for local producers and makers. When they are able to, people are willing to pay more for locally made products because they know they're investing back into the community. Another way that community members support each other is by sharing tools and resources that are needed to access certain foods. As one participant explained:

One of the fellows who works at the ocean farm just bought a skiff for himself, and him and his family are just moving back to the community in Metlakatla and

it's like, once folks saw that he had a skiff with room, he said he's literally been out every single spare moment, taking elders and people from the community out on the water and fishing, and taking them to those spots that they haven't been in a long time. (Participant 9)

From this perspective, community members have increased access to food not because it is being provided to them, but because others are helping them to obtain it themselves. Interactions such as this are common within smaller networks that exist within the larger community, many of which form around cultural groups. However, instead of turning inwards, these groups often support each other and the community at large. Examples of this include the free meals served by the Sikh temples and the cultural events hosted by the Filipino-Canadian Association.

4.3.2. Physical/Organizational Strengths

Physical strengths of Prince Rupert's food system that were mentioned the most during focus groups and interviews were business that are recognized for their positive contributions to the local food system and the community (mentioned 15 times) and the richness of the local environment, which provides an abundance of foods (mentioned 13 times). Organizational strengths (mentioned three times) are resources in the community that fill gaps in the food system.

When participants identified local businesses as strengths of the food system, it was often because they provide access to local foods. Businesses like Yaga, Fukusaku, and Rainbow's End Farm were mentioned for the progressive approaches they take to producing and sourcing local food. Dolly's Fish Market and Rupert Meats were also mentioned as the only two retailers in town where people can buy local seafood and for the processing services they provide. Other organizations were mentioned for the important work they do in the community. For example, the Friendship House was highlighted for hosting community dinners and providing a welcoming and inclusive place for people to get together.

The ability to hunt, gather, fish, and grow a wide variety of foods was highlighted by participants as a strength of the local food system. Bog cranberries, sea asparagus,

moose, salmon, clams, and mushrooms are only some of the foods that can be obtained from the land in and around Prince Rupert. One participant stated:

Again, my perspective is different, because when the whole food system was collapsing in 2020, me and my family were totally fine. We were probably eating better than we normally eat on any given day in our modern society, So we rely, I would say, probably at least 70 – 80% of our food comes from the land and ocean. But most people don't get that opportunity. (Participant 6)

Though most wild foods are not easily accessible, some urban harvesting is possible in Prince Rupert. For example, nettle and salmonberries grow in town; however, many harvesting sites are disappearing as the port expands.

When it comes to resources that are making a positive contribution to the local food system, participants were eager to talk about the work being done by the Prince Rupert School District 52. Through the school meal program, students at certain schools have access to breakfast, lunch, and a food pantry with snacks. In addition to simply providing the calories and nutrients that students need, program coordinators are taking extra steps to incorporate local and traditional foods, such as salmon and BC fruit, which many students may not get access to otherwise. In addition, the variety of emergency food aid programs and organizations was highlighted for the broad coverage they provide. According to one participant with ties to an organization that provides food aid:

We're filling the gaps if people are choosing to use us. if we're not able to offer something, normally, there's someone else there that is already offering it. However, if they choose not to go at supper time, then they're missing out. But that's a choice that everybody gets to make. (Participant 14)

This perspective shows that between the food pantry, free meals, and other community resources, there are enough supports in Prince Rupert for no one to be going hungry.

4.4. Food System Changes

Discussions about changes in the food system over the time participants have lived in Prince Rupert revealed three main themes: access to food and resources,

climate and environmental factors, and residents' mindset (Figure 8). A total of 32 different changes were mentioned by participants that ranged from short- to long-term, as the length of time that participants have lived in Prince Rupert varied considerably (i.e., one year to 50 years).

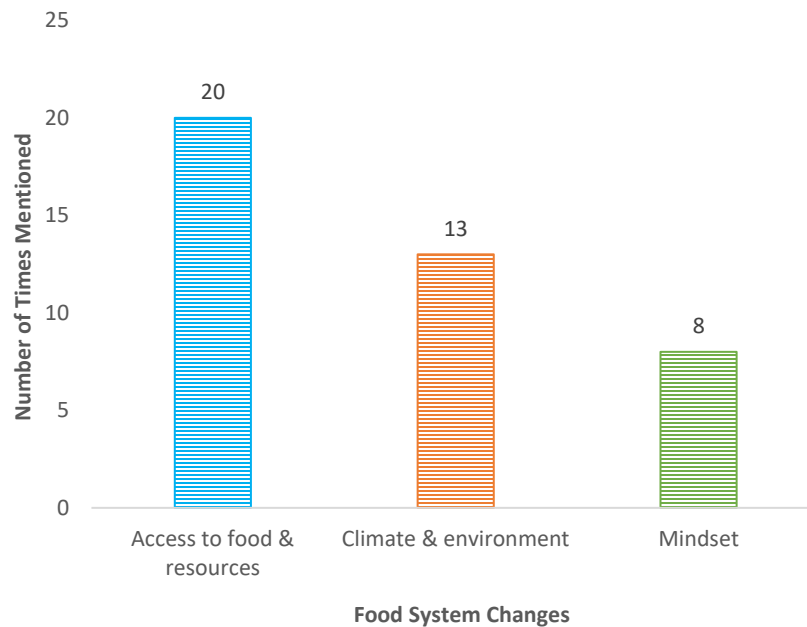


Figure 8. Frequency of food system changes mentioned in focus group discussions and interviews.

4.4.1. Changes to Food Access and Resources

Of all the changes mentioned, shifts in access to food and resources were the most common (mentioned 20 times). Participants described how there are fewer local foods in the grocery stores, a much smaller organic section, and more frequent shortages. While BC produce and meat used to be common, it is now difficult to find. Even though it has been more than a year since the World Health Organization officially ended the Public Health Emergency of International Concern status for COVID-19, participants noted that grocery stores in Prince Rupert have yet to fully recover and continue to experience unstable supply. One participant also mentioned how the grocery stores no longer have a bulk section and carry fewer items in large packages. Instead, everything is packed in small quantities for a higher price, which makes it more difficult for lower income households to buy enough food.

In terms of wild foods, participants observed that fewer people are fishing, especially in Indigenous communities. As one participant explained:

So traditionally, fishing families were very generational. Vessels were passed down through family groups but families can no longer afford them because there's limited economic opportunities. Now you have a total lack of knowledge and infrastructure being passed down through families, So if there's very limited opportunities to go make a living with a vessel, people abandon them. Then that in turn limits their access to any kind of recreational or traditional harvest.

(Participant 6)

Even if people can afford the gear and equipment needed for fishing, there are fewer opportunities to fish. Over the last decade, fishery closures have become more common, especially for salmon. While the salmon gillnet fleet used to be a good entry level fishery, it is no longer economically viable for most fishers, as there are very few openings a year and the timing is inconsistent. As a result, there is less fish in town and fishers are less likely to put in the effort to sell direct to the community. Participants recalled a time when people could go down to the docks and buy fish directly from fishers, but noted that this market no longer exists. In addition, there are less local fish processing options than there used to be, which has made it harder to find local seafood in town, which in turn has increased the price.

4.4.2. Changes to the Climate and the Environment

Food system changes brought about by the climate and the environment were mentioned 13 times. Discussions often centered around the effects of climate change on wild foods. Marine-based foods, in particular, are highly susceptible to changes in water temperature and have been affected by the warming climate. For example, participants noted how paralytic shellfish poisoning – which is caused by harmful algal blooms called red tides – used to only be an issue in the summer but can now occur in the middle of winter. In addition, bacteria grows faster in warmer water and shellfish can become contaminated more easily, which makes shellfish harvesting much riskier than it used to be. Climate change is also affecting salmon through disruptions to migration patterns, reduced food availability, and increased stress. As a result, salmon stocks in Prince Rupert are declining and the fishery is experiencing more frequent closures.

Participants also noted that climate change is having a noticeable impact on gardening. Over the last few years, the seasons have been highly unpredictable, with generally colder winters and hotter summers and much more frequent storms and extreme events. Despite the inconsistencies, the overall trend is seen as beneficial for gardening, as the growing season has gotten longer and temperatures have risen. The frequency and intensity of extreme events is also affecting land- and marine-based wild foods. As one participant stated:

A change in weather and timing is huge. Like you get these crazy storms and then it affects an array of things. From local crabapple bushes and berries being affected by torrential downpour and then super dry waves, to how salmon rivers are affected where, it just rains like crazy, which erodes the sides of the river bank, which then makes the riverbank wider and less deep, which then warms the water, which then affects the salmon, and then you get again these heat waves out of nowhere. The erraticness of weather due to climate change affects everything from berries to salmon to animals to gardens. (Participant 15)

At the same time, harvesting areas are disappearing with the growth of urban and industrial areas. From the expansion of the port in town to resource extraction activities in the surrounding forests, participants described losing access to key foraging sites that can't be replaced. So, while there are still abundant food resources around Prince Rupert, there is only a fraction of what there used to be.

4.4.3. Changes to Mindsets

Shifts in residents' mindsets are considered to have affected the food system in several ways. The first is that, due to recent shortages, more people are prone to panic buying, even when there is no real cause for concern. Another is that people are focusing more on themselves and less on the community as a whole. As one participant stated:

I think over the last five years in particular, we turned really inwards, and we need to turn back out a little bit. (Participant 13)

While there was a surge in generosity and community spirit during the COVID-19 pandemic, it hasn't been sustained, and many organizations are suffering from a lack of volunteers and donations.

At the same, there is an expanding community of home gardeners. Participants noted that local large-scale growing projects – like the Yaga greenhouse and the Kaien Island Urban Farm – have helped drive this momentum by demonstrating the feasibility of cultivating a variety of crops. Inspired by these successes, more residents are taking up gardening and are building communities around a shared passion for growing food.

4.5. Food System Ideas and Opportunities

In many cases, when participants were describing a food system challenge or barrier, they also had an idea for a solution. While fewer solutions were mentioned than weaknesses (i.e., 38 compared to 117), many of the proposed solutions would fill multiple gaps. When asked about their wish list for the food system, the responses fell into three main categories: infrastructure, programs, and policy (*Figure 9*).



Figure 9. Frequency of food system ideas and opportunities mentioned in focus group discussions and interviews.

4.5.1. Infrastructure Ideas

Despite the wide array of food system weaknesses, participants agreed that two main pieces of infrastructure would make the most difference to their food system: a licensed community kitchen with a processing facility and a local food hub.

If local fishers had access to a licensed kitchen with a processing facility, participants believe that access to local seafood in the community would increase exponentially. Not only would fishers be able to sell portions from a retail establishment instead of an entire fish on the dock, they could also sell value added products, such as stocks; marinated fillets; and canned, smoked, or sushi grade fish. When asked if there are any examples of places like this that are working well, participants identified the Dock+ in Port Alberni, which has a commercial kitchen, a blast freezer, and cold/dry storage (The Dock+, n.d.).

Participants also expressed a desire for a central place in town where they can buy local foods and think that a local food hub would greatly benefit the community. Beyond bringing local products together in one place, a local food hub would help connect producers and makers with a wider market and fill gaps in knowledge about what is available and when. A centrally located downtown food hub could also attract cruise ship visitors, who primarily support large retailers in town.

Other ideas for infrastructure include:

- A composting facility – ideas were shared about partnering with local fish processors and arborists to redirect their waste from the landfill.
- A community freezer – helpful for people who live in apartments or shared accommodation and don't have the space for large items like whole fish.
- Designated parking area for out-of-town vendors – consistent hours and low/no fees could help to attract more vendors.
- A northern food distribution hub – would help to shorten the food supply chain for towns like Prince Rupert.

- A large-scale indoor farming business that can produce local food affordably – suitable sites were identified in the industrial park.
- A shellfish testing lab – would allow for samples to be tested locally, which may result in fewer shellfish harvesting closures. Could be operated through a First Nations Guardians program, which are supported by the federal government.

4.5.2. Program Ideas

With access to more educational programs, residents of Prince Rupert would be more self-sufficient and the food system as a whole would be more resilient. Potential topics include gardening, composting, meal planning, wild plant identification, foraging best practices, canning and processing, and how to eat a more seasonal diet.

Composting was identified as both a gap in infrastructure and programming. To improve the soil for growing, compost is necessary in Prince Rupert; however, there are no resources for gardeners to access compost locally or make their own. Because there is no municipal compost facility, all food waste in Prince Rupert goes in the garbage. While participants identified a compost facility as key infrastructure that would improve the local food system (as discussed in Section 4.5.1), there are opportunities for the City to promote backyard composting instead. For example, the City could produce a brochure or webpage with information on what products can be composted and what cannot, how to manage the composting process, and how to troubleshoot common issues. At the same time, the City can launch a home composter rebate program, similar to the Sunshine Coast Regional District, which helps to offset the costs of composting equipment and materials. The information could be posted or linked through the City's website or made available through workshops or information sessions at one of the community gardens. For example, Vancouver has a compost demonstration garden that teaches residents how to compost their waste, take care of their home landscapes, and grow food in the city.

Other ideas for programming include:

- A dock sales newsletter – would facilitate communication between fishers who are interested in selling direct to consumers and their customers.

- Collaboration between the School District 52 and the City to use school district land and greenhouses for producing food, especially in the summer when they are not in use – would open up additional sites for urban agriculture.
- Community food policy committee – provides food policy recommendations to council.
- Small-scale growing projects at long term care facilities, shelters, or supportive housing – policies exist through Northern Health (i.e., the On-site Gardens and Produce for Patient/Resident Consumption Policy) that facilitate food production through resident-driven co-designed gardening programs.

4.5.3. Policy Ideas

Because most food policies in Canada are developed at federal and provincial levels, only a few of the policy changes suggested by the participants are within the City's jurisdiction and have to do with zoning and land-use bylaws. Municipal policy changes mentioned by the participants include:

- Simplifying the greenhouse permitting process.
- Adopting urban livestock policies that allow residents to raise backyard hens.
- Eliminating zoning or design restrictions on home and community gardens.
- Adopting policies and processes to allow residents to grow food on public property, where appropriate.
- Supporting the establishment of a food policy council and implementing their recommendations.
- Amending zoning bylaws to encourage and facilitate out of town vendors.

Additionally, many discussions centered around policies that constrain Indigenous food sovereignty and limit the role that Indigenous harvesters have in the dominant food system. As one participant stated:

We modified the creeks and streams, we modified the forest, we modified the oceans to create abundance. We didn't just only take what we needed, we created very strong economic opportunities and trade groups that are well documented through the grease trails. We fed hundreds of thousands of people along the coast, where a municipality – Prince Rupert – can't feed anybody. They estimate 40,000 to 60,000 people lived in Prince Harbor under a traditional law and governance system that allowed the environment to feed that many people. I can tell you right now, Prince Rupert harbour can't feed anybody, and it's in a state that shouldn't be feeding anybody. Any way you look at the problems in the community, Indigenous people are being impacted. Indigenous people have solutions that aren't being heard or discussed. (Participant 6)

While federal laws like the *Constitution Act, 1982* affirm Indigenous and treaty rights including hunting, harvesting, and fishing, these rights are limited to subsistence, cultural, and ceremonial practices and Indigenous peoples have restricted economic opportunities when it comes to selling traditional foods with non-Indigenous people. As such, there are few legal avenues for food resources within Indigenous communities to leave the communities. As discussed above, transactions between Indigenous harvesters and settlers are still occurring, but they happen illegally. Many participants recognize how important Indigenous food resources are to non-Indigenous residents of Prince Rupert and voiced their support for policy changes that would empower Indigenous food networks, create economic opportunities around traditional foods, and restore Indigenous peoples with decision making power over their lands and waters.

Chapter 5.

Discussion and Recommendations

The findings of this study highlight the complexity of Prince Rupert's food system and its barriers and opportunities to become more resilient. As a social-ecological system, the resilience of Prince Rupert's food system is determined by its ability to withstand a disturbance, adapt, and, transform (Walker et al., 2004).

Conversations about the local food system revealed that, while Prince Rupert's food system overall is vulnerable to disruptions, there are pockets of resilience that can be better supported. For example, the informal food economy increases the capacity of the community to withstand disruptions in food supply. This finding is supported by other studies that have shown how informal food economies can be crucial to the food security of both urban and rural communities (Davies & Evans, 2019; Freathy et al., 2024). Informal food economies can both help to sustain long-term food security and be used as a coping strategy in response to short-term food shortages (Tam et al., 2014). The fact that some participants of the study obtain most of their food from the land and waters around Prince Rupert indicates that there is no shortage of local foods available, as long as access and safety barriers can be overcome. At the same time, the dominant food system has been slow to adapt to changes. Ongoing shortages in the grocery stores and panic buying demonstrate that the global supply chain disruptions and scarcity mindsets present during the COVID-19 pandemic still linger in the community.

Based on the findings of the study, there are three main aspects of social-ecological resilience that could be better supported in Prince Rupert's food system: diversity, social capital, and governance. While the study had a small sample size, the findings indicate that there is consensus among most participants regarding the dominant weaknesses in the local food system. At a basic level, many food system gaps or barriers affect the population as a whole, despite social location. Examples of challenges experienced across the community include the land and climate limitations to growing food and the regulatory barriers that prohibit or discourage self-sufficiency. Food system strengths, on the other hand, are much closer tied to factors like income, social networks, and knowledge. For example, while the informal food economy was

highlighted as a strength by many participants, others reported that they were unable to participate because they lacked the necessary community connections. Similarly, many local businesses were identified as doing good work to increase access to locally produced food; however, their products can be too expensive for some households. Although overarching themes of food system changes and opportunities for improvement were identified, the specific ideas and perspectives within each category varied widely among participants. For example, the most frequently mentioned change appeared only five times, and 16 different opportunities were only mentioned once.

While the insights gathered are rich, contextualized, and grounded in the lived experiences of community members, further research is needed to increase the generalizability of the findings. Notably, this study did not capture the perspectives of several key groups, including low income individuals, those relying on social assistance, non-English-speaking community members, and youth. Despite these limitations, the recommendations presented in this chapter are well-founded, as they align with broader research on social-ecological resilience and are intended to serve as a foundation for future community dialogue and participatory planning.

5.1. Diversity

In the literature, social-ecological resilience is often discussed in terms of sensitivity. In general, the more sensitive systems are, the less resilient they are. When a system is sensitive, it means that its variables are close to their thresholds, so even a small disturbance can have a large effect (Hodbod & Eakin, 2015). Similar to the planetary boundaries framework (Rockström et al., 2009), food systems have safe operating spaces, beyond which the system will either collapse or transform (Paas et al., 2021). While this safe operating space is defined by social, ecological, and economic thresholds, its defining characteristic should be first and foremost that all people are food secure (Hodbod & Eakin, 2015). As such, a critical threshold for food systems is food accessibility, which is determined by both the physical availability of food and its affordability (Amjad et al., 2021).

In resilient food systems, food accessibility is robust because there are a diversity of food resources so that a disruption of one food source, supply chain, or production method does not cut off all food flows (Kaseva et al., 2019). Given that Prince

Rupert only has two major grocery stores, one main supply route (i.e., trucked in from the Lower Mainland), and limited capacity for agriculture, the local food system would benefit from increased diversity. This should occur in two ways: functional and response, which encompass both the range of different food system components (i.e., functional) and how they react to disturbance (i.e., response) (Hodbod & Eakin, 2015). In Prince Rupert, both functional and response diversity can be increased through efforts to diversify food production and distribution in the community. Given the land and climate limitations to agriculture, Prince Rupert will always depend on food imports, yet there are opportunities to increase local food production, which can help to fill gaps when the supply chain is disrupted (Söukand et al., 2021).

To increase local food production in Prince Rupert, the City can:

- Strengthen informal food networks that distribute wild foods within the community. The City can improve access to land and water for harvesting, support food sharing and knowledge exchange, and provide infrastructure for local processing and distribution. For example, the City can invest in a commercial kitchen with processing facilities that is available for community use, which will improve both local access to seafood and economic opportunities for fishers. Dock+ in Port Alberni is a good example of inclusive and accessible community processing infrastructure and serves as a model that the City should aim to replicate. While a 2018 study found that there was insufficient demand and willingness to pay for local seafood in Prince Rupert (Ahmed, 2019), the findings of this study indicate that conditions in the community may have changed and that residents are more supportive of the local seafood economy.
- Reduce local regulatory barriers to small-scale urban farming, such as those that ban backyard livestock and restrict food production. For example, the City can develop an Urban Agriculture Plan that identifies suitable urban agriculture sites in town, recommends policies that encourage food production, and designates actions that the City will take to support and expand urban agriculture. The City should look to municipalities like Victoria that have comprehensive urban agriculture policies and a regulatory environment that encourages food production.

- Support Indigenous food sovereignty and uphold their commitments to develop an implementation plan of the United Nations Declaration on the Rights of Indigenous Peoples (UNDRIP). The City should work with local First Nations to protect and restore traditional food sources, support Indigenous food practices and businesses, and acknowledge and remove colonial barriers. For example, the Vancouver Park Board's *Local Food System Action Plan 2021* includes "making space for Indigenous food sovereignty" in its implementation plan and sets goals to improve access to municipal land for Indigenous food and medicine practices and to increase funding for Indigenous food spaces and initiatives (Vancouver Board of Parks and Recreation, 2021).

5.2. Social Capital

Built through strong social networks, a sense of belonging, and positive connections, social capital is another important aspect of social-ecological resilience. Because it is hard to measure, social capital is often overlooked in resilience planning, which focuses instead on physical infrastructure and organizational capacity (Aldrich & Meyer, 2015). However, social capital is the reason why people help each other and what gives communities the ability to respond, adapt, and recover from disturbances. Without social capital, communities are vulnerable to stress – lacking the networks needed to share information and resources, the trust needed to ask each other for help, and the ability to quickly mobilize in times of crisis (Gero et al., 2020). In the literature, social capital exists as three main types: bonding, bridging, and linking (Szreter, 2004). Bonding social capital exists in the connections between individuals who are emotionally connected, such as family members and friends, and is what drives people to support each other and offer personal assistance in times of need (Claridge, 2018). While bonding social capital connects people within social groups, bridging social capital exists between social groups and is what facilitates collaboration between people with different backgrounds (Claridge, 2018). And finally, linking social capital is what exists between groups with different power dynamics (e.g., civilians and government). While it is considered to result in the weakest relationships, linking social capital is important for providing access to resources and information (Hawkins & Maurer, 2010).

In the context of food systems, social capital makes communities more resilient because it facilitates collective community responses to short-term food insecurity that

are more effective than individual responses (Chriest & Niles, 2018). An important outcome of social capital in food systems is that it adds stability, as social networks can help to eliminate individual vulnerabilities and build communal resilience (Nosratabadi et al., 2020). While social capital is created through human interactions at every stage of the food supply chain, social capital exists in Prince Rupert primarily through the sharing of food and information. Through the informal food economy, Prince Rupert residents have fostered social capital through transactions that have helped to build trust and increase access to wild foods. Among the gardening community, social capital has been built through the sharing of knowledge and experience along with seeds, tools, and physical labour that help people become more successful at growing food. Social capital has also been developed through the exchange of skills, resources, and knowledge in spaces like the town's community gardens where people work together towards a common goal. Social capital also exists within the Metlakatla Food Fish Program, which helps to build and strengthen community relationships, increase access to food, and facilitate knowledge exchange around traditional food systems. Another important source of social capital in Prince Rupert are the programs and organizations that provide emergency food aid. The fact that there are enough free meals to keep everyone fed is an important strength to highlight, as a lack of sufficient resources and services (i.e., linking social capital), can force community members to rely on each other for support (i.e., bonding social capital), which can create feelings of embarrassment and shame that prevent people from reaching out for help (Leddy et al., 2020).

To increase social capital in Prince Rupert the City can:

- Develop programs that build skills and connections in the broader community. For example, the City can support and facilitate a program that connects fruit tree owners with volunteers who pick and distribute the fruit that would otherwise go to waste. Similarly, a program could link homeowners with people who want to grow food but lack the space. The benefits of programs like these include stronger community relationships, knowledge sharing and skill development, breaking down existing social barriers, and building trust. In addition, the programs will increase access to fresh, local produce, which contributes to local food security. Examples of successful programs like these include the LifeCycles Project in Victoria and City Beet Farm in Vancouver.

- Support the creation of a community food hub that stocks local food products. From a social capital perspective, food hubs help to strengthen community relationships and trust by directly linking consumers and producers. At the same time, they increase access to locally produced food, foster collaboration, and keep more money in the community. In the literature, community food hubs are celebrated for their multifunctionality. In addition to increasing access to local foods, community food hubs can provide employment and training opportunities, host classes or workshops, and serve as a community gathering space (Horst et al., 2011). Food hubs can also be community-owned and operated, which deepen social ties through shared decision-making, volunteer work, and governance. The Cortes Island Natural Food Co-op on Cortes Island, BC, is an example of a community owned co-operative food business that the City can look to for guidance.

5.3. Governance

Governance is another key component of social-ecological resilience as it determines how communities manage and adapt to changes and challenges. To support resilience, governance systems need to be both stable – so that there is enough time for the policies to take effect – and adaptive – so that new needs can be met as conditions change (Beunen et al., 2017). Enabling both stability and adaptability requires that governments have the capacity to not only maintain essential functions but also integrate new information and make the necessary changes (Brown, 2022). Because these changes can be hard on the community, it is also important that governments are trustworthy so that citizens are willing to tolerate the potentially painful adjustments that are needed to withstand a crisis (Taniguchi & Marshall, 2018). Another component of governance that contributes to resilience is decentralization, which is the involvement of community groups in decision making. Because they are embedded in their communities, civil society organizations are a source of long-standing local knowledge that can help to identify problems early on and recommend solutions, which increases the capacity of the community to adapt (Fischer, 2021). They also contribute to resilience by facilitating communication and mobilizing resources, which helps communities to both respond to a crises and to quickly recover (Brown, 2022).

Food systems governance primarily involves the creation and implementation of food-related policies. As complex social-ecological systems that operate across multiple spatial, temporal, and jurisdictional scales, food systems need policies to guide food-related decisions so that actions do not have inadvertent consequences in other domains (Schneider et al., 2025). In resilient food systems, these policies support learning, adaptation, and self-organization without sacrificing equity and social justice (Schipanski et al., 2016). Because there are no overarching food system strategies in Canada to guide local policy efforts, municipalities are able to take place-based approaches and are not limited by provincial or federal mandates. However, this means that local food policies are often fragmented, emphasizing areas such as agriculture and food waste management while overlooking crucial aspects like Indigenous foodways and food self-reliance (Robert & Mullinix, 2018). While Prince Rupert has several food policies in the OCP, almost all local food initiatives are currently facilitated by local organizations or passionate individuals. As such, there is an opportunity for the City to play a larger role in local food governance.

To increase food system governance in Prince Rupert the City can:

- Implement the food policy recommendations in the OCP, including the development of a municipal food strategy. A dedicated food strategy will strengthen food governance by providing a clear framework for the implementation of food policies and programs. Informed by this study and additional community engagement, the strategy should be place-based and address the specific needs of the community. As a first step, the City can work with the community to develop a Local Food Charter that outlines their vision, values, and goals for the food system. Additionally, the City can amend existing bylaws (e.g., Zoning Bylaw No. 3462, 2021) to enable backyard livestock, food hubs, greenhouses, and other components of urban agriculture.
- Support the creation of a community-based food policy council that comprises a mix of voices and experiences. Food policy councils have many important roles in food governance, including policy development and advocacy, community outreach and education, and facilitating cross-sector collaboration (Schiff et al., 2022). The council should have an advisory role in the development of a municipal food strategy and work with the community to develop an inclusive

vision for a future food system. The food policy council can also develop and implement projects and programs, undertake monitoring and evaluation, and conduct community outreach. For example, the Squamish Food Policy Council has made a significant contribution to the Squamish-Lillooet regional food system. Examples of their success include a food asset map, a regional agriculture plan, and the Good Food Program, which supports the local food economy through the procurement of local food. As Ecotrust is currently working to establish a Community Food Action Committee in Prince Rupert, the City should actively support these efforts and collaborate with the Committee once it is in place.

Chapter 6.

Conclusion

Through both slow- and rapid-onset shifts, climate change is affecting food systems. In BC, extreme weather events are impacting both food security and safety, particularly in coastal and remote communities that rely on long-distance food imports. In response, building resilience is emerging as a solution to the problems that climate change are causing for food systems. Enhancing a system's ability to withstand and recover from disruptions, resilience is especially important for social-ecological systems – like food systems – that have interacting human and environmental components and many points of vulnerability. To become more resilient, food systems must be carefully planned so that food security is maintained despite shocks or stressors. Today, food security and resilience dominate food systems planning; along with a growing focus on equity, justice, and sustainability. Often, food systems that would benefit the most from increased resilience are in remote and northern regions where food security is threatened by long supply chains, insufficient services, and colonial practices that have separated Indigenous communities from their traditional food systems.

As a remote and northern community, Prince Rupert, BC was the subject of this study, that aimed to enhance understanding of the local food system through a baseline assessment and mapping of valued components (typically called assets). This study collected community perspectives on the local food system through focus groups and interviews with 15 residents of Prince Rupert who have local food systems knowledge. The findings were analyzed through a social-ecological resilience lens to identify opportunities to build a more resilient local food system that is also equitable, sustainable, and secure. The study asked the following research questions: (1) What valued components are present in Prince Rupert's food system?; (2) What weaknesses, strengths, and changes exist in Prince Rupert's food system?; and (3) What are opportunities to improve Prince Rupert's food system?

The findings of this study reveal that Prince Rupert's food system has 163 valued components, comprising 90 built, 26 land based, 23 social, 20 ecological, and four that belong to multiple categories. Weaknesses identified by participants include food access

barriers, gaps in food availability, and gaps in food system capacity. Most weaknesses are associated with challenges accessing and affording local foods, particularly seafood, which is unattainable for most residents. Strengths identified by participants include social/cultural and physical/organizational components. One celebrated feature of the local food system is the informal food economy, which is essential to the food security of many people. Changes identified by participants include those that have occurred to food access, the climate and environment, and mindsets. Overall, the food system is considered to be less stable than it used to be and wild food are harder to access. Opportunities identified by participants include ideas for infrastructure, programs, and policy that will increase access to local foods, facilitate food self-sufficiency, and support Indigenous food sovereignty.

When analyzed through a social-ecological resilience lens, the findings of the study indicate that the food system overall is vulnerable to disturbances and would benefit from increased diversity, stronger social capital, and more effective governance. Specific recommendations for the City include:

- Investing in a community-based commercial kitchen and processing facility;
- Reducing regulatory barriers to small-scale urban farming;
- Upholding their commitments to the UNDRIP;
- Developing community food-based programs;
- Facilitating the creation of a local food hub;
- Developing and implementing a food strategy and amending bylaws to enable urban agriculture; and
- Supporting the establishment of a community-based food policy council.

With the magnitude and extent of changes needed, food system resilience might seem like the pot of gold at the end of the rainbow, but the so-called City of Rainbows seems like a pretty good place to try.

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Appendix A.

Focus Group and Interview Questions

1. Here is a map of the valued food system components that have been identified by community members in Prince Rupert. Are any missing or incorrect? Is there anything you think should be added?
2. What are some of the most frustrating or challenging aspects when it comes to food-related matters in your community? What are the weaknesses in the current food system?
3. What are some of the highlights or best food resources in your community? Are there any hidden gems or special places/sites that are important to you? To clarify, we mean businesses, programs, or community spaces that you like who are doing good work, not sacred or culturally significant places – though these can also be shared if you wish.
4. Has your access to food changed over the period that you've lived here? Can you describe how?
5. What is on your wish list for the Prince Rupert food system? What do you think could make it more resilient, secure, or equitable?

Appendix B.

Prince Rupert's Valued Food System Components

Name	Type	Category	Address
Saltwater Bakery	Bakery	Built	5 Cow Bay Rd, Prince Rupert, BC V8J 1A5
Swingsmith Cages	Canteen	Built	869 Fraser St, Prince Rupert, BC V8J 1R1
Moose Lodge	Canteen/kitchen	Built	745 1st Ave W, Prince Rupert, BC V8J 1B2
A & S Catering Ltd.	Caterer	Built	500 2 Ave W, Prince Rupert, BC V8J 3T6
Fresh Onion Cafe & Catering	Caterer	Built	309 2 Ave W, Prince Rupert, BC V8J 3T1
Javadotcup	Coffee shop	Built	516 3 Ave W, Prince Rupert, BC V8J 1L8
Cowpuccino's Coffee House	Coffee shop	Built	25 Cow Bay Rd, Prince Rupert, BC V8J 1A5
7-Eleven	Convenience store	Built	250 2 Ave W, Prince Rupert, BC V8J 1G5
Express News	Convenience store	Built	220-500 2 Ave W, Prince Rupert, BC V8J 1G4
PJ's Midway Foods	Convenience store	Built	901 6 Ave E, Prince Rupert, BC V8J 1X7
PJ's Park Avenue Foods	Convenience store	Built	1665 Park Ave, Prince Rupert, BC V8J 3Y7
PJ's Foods Too	Convenience store	Built	601 6 Ave W, Prince Rupert, BC V8J 1Z8
West End Grocery	Convenience store	Built	841 2 Ave W, Prince Rupert, BC V8J 1H6
Shoppers Drug Mart	Drug store	Built	500 2 Ave W Unit 249, Prince Rupert, BC V8J 3T6
Mami Temaki Food Truck	Food truck	Built	716 3rd Avenue, West, Prince Rupert, BC V8J 1M4
Redneck Kitchen	Food truck	Built	
Uncle Robbie's Food Truck	Food truck	Built	
Chevron	Gas station	Built	400 2 Ave W, Prince Rupert, BC V8J 1G7
Petro Canada	Gas station	Built	537 Hays Cove Cir, Prince Rupert, BC V8J 2C3

Name	Type	Category	Address
Petro Canada	Gas station	Built	100 Grassy Bay Ln, Prince Rupert, BC V8J 3P6
Safeway	Grocery store	Built	200 2 Ave W, Prince Rupert, BC V8J 1G5
Save on Foods	Grocery store	Built	841 3 Ave W, Prince Rupert, BC V8J 1M7
Walmart	Grocery store	Built	500 2 Ave W, Prince Rupert, BC V8J 3T6
Maverick Foods	Grocery store	Built	1352 11 Ave E, Prince Rupert, BC V8J 2X1
Mission Health & Wellness	Grocery store (specialty)	Built	800 McBride St Unit A, Prince Rupert, BC V8J 3G8
JNR Mart Filipino / Philippines Store	Grocery store (specialty)	Built	303 3 Ave W, Prince Rupert, BC V8J 1L2
Cafe Hong Lan & Groceries	Grocery store (specialty)	Built	685 3 Ave W, Prince Rupert, BC V8J 1M3
Colussicakes	Home-based	Built	
Cook-a-roux	Home-based	Built	
Cookie Creations	Home-based	Built	
Lunch lady	Home-based	Built	
Mãe & Filha Baked Donuts	Home-based	Built	
Messy Bun	Home-based	Built	
Raincoast Cakes	Home-based	Built	
Sourdough YPR	Home-based	Built	
Spyce	Home-based	Built	
Sweet Creations Cupcakes and Cakes	Home-based	Built	
Lax kw'alaams Hall	Kitchen	Built	Church St, Prince Rupert, BC V8J 2N5
Masonic Temple	Kitchen	Built	180 6 Ave E, Prince Rupert, BC V8J 1W1
Prince Rupert Lutheran church	Kitchen	Built	460 McBride St, Prince Rupert, BC V8J 3G2
Curling Club	Kitchen Facility	Built	2219 Seal Cove Rd, Prince Rupert, BC V8J 2G4
Jim Ciccone Civic Centre	Kitchen/canteen	Built	1000 McBride St, Prince Rupert, BC V8J 3H2
Eat Street	Market	Built	3rd Ave at 7th St

Name	Type	Category	Address
Lax Süülda Container Market	Market	Built	263 Manson Way, Prince Rupert, BC V8J 3X4
Aero Trading	Processing	Built	1080 Skeena Dr, Port Edward, BC V0V 1G0
Canfisco	Processing	Built	181 George Hills Way, Prince Rupert, BC V8J 1A3
Coast Tsimshian Fish Plant Ltd	Processing	Built	Shakes St, Lax Kw'alaams, BC V0V 0A2
Odin Seafood	Processing	Built	237 Cow Bay Rd, Prince Rupert, BC V8J 1A2
Rupert Meats	Processing/ specialty	Built	207 3 Ave E, Prince Rupert, BC V8J 1K4
McDonalds	Restaurant	Built	99 11 Ave E, Prince Rupert, BC V8J 2W2
Tim Hortons	Restaurant	Built	636 2 Ave W, Prince Rupert, BC V8J 1H2
P & P Steak and Pasta	Restaurant	Built	816 3 Ave W, Prince Rupert, BC V8J 1M7
West End Restaurant Ltd.	Restaurant	Built	610 3 Ave W, Prince Rupert, BC V8J 1M3
Galaxy Gardens Restaurant	Restaurant	Built	844 3 Ave W, Prince Rupert, BC V8J 1M6
Stardust Restaurant	Restaurant	Built	625 3 Ave W, Prince Rupert, BC V8J 1M5
Sonbadas Steakhouse Prince Rupert	Restaurant	Built	909 3 Ave W, Prince Rupert, BC V8J 1M9
Pizza Hut	Restaurant	Built	616 3 Ave W, Prince Rupert, BC V8J 1M2
Lee & Ann's	Restaurant	Built	636 3 Ave W, Prince Rupert, BC V8J 1M2
Pho 88 Restaurant	Restaurant	Built	427 3 Ave W, Prince Rupert, BC V8J 1L6
Sukoshi Kitchen	Restaurant	Built	251 3 Ave W, Prince Rupert, BC V8J 1L2
Sunset Lounge + Grill	Restaurant	Built	243 3 Ave W, Prince Rupert, BC V8J 1L2
Bob's on the Rocks	Restaurant	Built	299 George Hills Way, Prince Rupert, BC V8J 2A3
Opa Sushi	Restaurant	Built	34 Cow Bay Rd, Prince Rupert, BC V8J 1A5

Name	Type	Category	Address
Arabisk Mediterranean Cuisine	Restaurant	Built	2209 Seal Cove Rd, Prince Rupert, BC V8J 2Z9
Charley's Lounge	Restaurant	Built	222 1st Ave W, Prince Rupert, BC V8J 1A8
Wheelhouse Brewing Company	Restaurant	Built	380 Bill Murray Dr, Prince Rupert, BC V8J 4P5
OV Burger Bar	Restaurant	Built	950 1st Ave W, Prince Rupert, BC V8J 1A9
Naomi's Grill	Restaurant	Built	737 2 Ave W, Prince Rupert, BC V8J 1H4
Mama's Restaurant & Steakhouse	Restaurant	Built	935 2 Ave W, Prince Rupert, BC V8J 1H8
The Ridge	Restaurant	Built	1051 Chamberlin Ave, Prince Rupert, BC V8J 4J5
Rodhos Pizza	Restaurant	Built	716 2 Ave W, Prince Rupert, BC V8J 1H3
Pavillion Restaurant	Restaurant	Built	346 Stiles Pl, Prince Rupert, BC V8J 3S5
Vihaan's Pizza	Restaurant	Built	715 2 Ave W, Prince Rupert, BC V8J 1H4
La Gondola Cafe	Restaurant	Built	710 1st Ave W, Prince Rupert, BC V8J 3V6
Highliner Restaurant	Restaurant	Built	815 1st Ave W, Prince Rupert, BC V8J 1B3
Bamboo Shoot	Restaurant	Built	631 2 Ave W, Prince Rupert, BC V8J 1H1
Waterfront Restaurant	Restaurant	Built	222 1st Ave W, Prince Rupert, BC V8J 1A8
Smile's Seafood Cafe Ltd.	Restaurant	Built	113 Cow Bay Rd, Prince Rupert, BC V8J 1A2
Chances Grill PR	Restaurant	Built	240 1st Ave W, Prince Rupert, BC V8J 4P8
Breakers Pub	Restaurant	Built	117 George Hills Way, Prince Rupert, BC V8J 1A3
Prince Rupert Golf Club	Restaurant	Built	523 9 Ave W, Prince Rupert, BC V8J 2S8
North Pacific Cannery National Historic Site	Restaurant (special events)	Built	1889 Skeena Dr, Prince Rupert, BC V0V 1G0
Fukasaku of Prince Rupert	Restaurant/ grocery store (specialty)	Built	215 Cow Bay Rd, Prince Rupert, BC V8J 1A2

Name	Type	Category	Address
Sugar Free Cafe	Restaurant/ grocery store (specialty)	Built	174 3 Ave E, Prince Rupert, BC V8J 1K5
Dolly's Fish Market	Restaurant/ processing/ specialty	Built	7 Cow Bay Rd, Prince Rupert, BC V8J 1A5
Blue Cow Seafood	Specialty	Built	245 Cow Bay Rd, Prince Rupert, BC V8J 1A2
Bulkley Valley Wholesale	Wholesale	Built	3302 BC-16, Smithers, BC V0J 2N0
J&F Distributors	Wholesale	Built	3109 School St., Terrace, BC V8G 5T4
Horizon Distributors	Wholesale	Built	5589 Trapp Ave, Burnaby, BC V3N 0B9
Organic Matters	Wholesale	Built	19028 27 Ave, Surrey, BC V3S 3V7
Yaga Cafe Garden Co.	Restaurant/ greenhouse/ classes	Built/Land- based/Social	2250 Bellis Rd, Prince Rupert, BC V8J 3P9
Loaf of Bread Café	Restaurant/ greenhouse/ kitchen	Built/Land- based/Social	10 Ocean Dr, Kitkatla, BC V0V 1C0
Nisga'a Hall	Kitchen/meal program	Built/social	860 3 Ave W, Prince Rupert, BC V8J 1M6
Fairview dock	Dock	Ecological	2100 Park Ave, Prince Rupert, BC V8J 4B2
Port Edward warf	Dock	Ecological	870 Skeena Dr, Port Edward, BC V0V 1G0
Prince Rupert harbour	Dock	Ecological	121 George Hills Way, Prince Rupert, BC V8J 1A3
Bog cranberries	Land	Ecological	
Deer	Land	Ecological	
Forest gardens	Land	Ecological	
Haida Gwaii blueberries	Land	Ecological	
Huckleberries	Land	Ecological	
Moose	Land	Ecological	
Nettle	Land	Ecological	
Salmonberry bushes	Land	Ecological	
Sea asparagus	Land	Ecological	
Spruce tips	Land	Ecological	

Name	Type	Category	Address
Prawns	Water	Ecological	
Shrimp	Water	Ecological	
Skeena River salmon	Water	Ecological	
Pacific ocean salmon	Water	Ecological	
Skeena River oolichan	Water	Ecological	
Seaweed	Water	Ecological	
Tuna	Water	Ecological	
Heiltsuk nation spawn on kelp fishery	Aquaculture	Land-based	
Metlakatla regenerative ocean farm	Aquaculture	Land-based	
McKay Street Community Garden	Community garden	Land-based	McKay St, Prince Rupert, BC V8J 3S8
Metlakatla Community Greenhouse	Community garden	Land-based	8HP4+W4 Metlakatla, British Columbia
Overlook Community Garden	Community garden	Land-based	Overlook St, Prince Rupert, BC V8J 2C8
Port Edward Community Garden	Community garden	Land-based	772 Pacific Ave, Port Edward, BC V0V 1G0
Rainbow End Farm	Farm, CSA	Land-based	1101 Water St, Prince Rupert, BC V8J 1C1, Canada
6S Farms	Out of town vendor	Land-based	4003 E Valley Rd, Houston, BC V0J 1Z2
Aurora Sporialis	Out of town vendor	Land-based	1105 Chimney Valley Road, Williams Lake, BC V2G 4W5
Bison Guy	Out of town vendor	Land-based	5375 Beryl Prairie Rd, Hudson's Hope, BC V0C 1V0
Farmer Cam's Foods	Out of town vendor	Land-based	3527 River Dr, Terrace, BC V8G 3P2
Kalum Acres	Out of town vendor	Land-based	5550 Giesbrecht Rd, Terrace, BC, Canada, British Columbia
Smithereens Mushrooms	Out of town vendor	Land-based	2230 22 Ave, Smithers, BC V0J 2N6
Speckled Sow	Out of town vendor	Land-based	1487 Derksen Rd, Vanderhoof, BC V0J 3A1

Name	Type	Category	Address
W Diamond Ranch	Out of town vendor	Land-based	13380 Lawson Rd, Telkwa, BC V0J 2X3
Happy Pig Organic Farm	Out of town vendor	Land-based	21641 Walcott Rd, Telkwa, BC V0J 2x2
The Apple Guy	Out of town vendor	Land-based	110 Heritage Way, Castlegar, BC V1N 4M5
Fruit trucks	Out of town vendor	Land-based	
Guthrie's Fresh Fruit	Out of town vendor	Land-based	
Joe Lewis Egg and Meat Producers (Diana Lake)	Out of town vendor	Land-based	
Sassa's Sweet Chilliwack Corn	Out of town vendor	Land-based	
Backyard Chickens	Urban agriculture	Land-based	
Backyard Goats	Urban agriculture	Land-based	
Backyard Rabbits	Urban agriculture	Land-based	
Bee Keepers	Urban agriculture	Land-based	
Crab	Water	Land-based	
K'oomtk Youth Centre	Food pantry	Social	309 2 Ave W Suite 151, Prince Rupert, BC V8J 3T1
Trinity Men's Recovery House	Free meals	Social	333 11 Ave E, Prince Rupert, BC V8J 2W4
Annunciation Catholic Church	Free meals	Social	635 5 Ave W, Prince Rupert, BC V8J 1V1
First United Church of Prince Rupert	Free meals	Social	636 6 Ave W, Prince Rupert, BC V8J 1Z9
Gurdwara Sikh Temple	Free meals	Social	200 4 Ave E, Prince Rupert, BC V8J 1N5
Kxeen Community Services Society	Free meals	Social	309 2 Ave W #265, Prince Rupert, BC V8J 3T1
Sikh Missionary Society of Prince Rupert	Free meals	Social	1945 McNicholl Ave, Prince Rupert, BC V8J 2X7
Salvation Army	Free meals/ kitchen/food pantry	Social	25 Grenville Ct, Prince Rupert, BC V8J 1R3
Metlakatla Food Fish Program	Indigenous program	Social	
Prince Rupert Middle School	Meal program	Social	417 9 Ave W, Prince Rupert, BC V8J 2S9

Name	Type	Category	Address
Charles Hays Secondary School	Meal program	Social	201 Prince Rupert Blvd, Prince Rupert, BC V8J 3W1
Ecole Roosevelt Elementary School	Meal program	Social	800 Summit Ave, Prince Rupert, BC V8J 2A3
Rod and Gun club	Membership meals	Social	Trans-Canada Hwy, Prince Rupert, BC
Meals on Wheels	Other	Social	300 3rd Avenue W Prince Rupert, BC V8J
North Coast Transition Society	Shelter	Social	1402 Park Ave, Prince Rupert, BC V8J 3W6
Crane's Crossing	Shelter	Social	1080 3 Ave W, Prince Rupert, BC V8J 1N1
Crow's Nest Lodge	Shelter	Social	Park Ave, Prince Rupert, BC
Acropolis Manor	Subsidized meal program	Social	1325 Summit Ave, Prince Rupert, BC V8J 4C1
Royal Canadian Legion Branch 27	Subsidized meal program	Social	812 3 Ave W, Prince Rupert, BC V8J 1M6
School District No. 52 (Prince Rupert)	Subsidized meal program	Social	634 6 Ave E, Prince Rupert, BC V8J 1X1
Pacific Coast School	Subsidized meal program	Social	309 2 Ave W #285, Prince Rupert, BC V8J 1G6
Seafarers Mission	Subsidized meal program	Social	245 3 Ave W, Prince Rupert, BC V8J 1L2
Senior's Centre	Subsidized meal program	Social	21 Grenville Court, Prince Rupert, BC V8J 1R3
Friendship House	Kitchen/classes/subsidized meal program	Social/built	744 Fraser St. Prince Rupert BC V8J 1P9