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Community Agroecological Values Framework: connecting the community capitals and agroecology to advance northern food system transformation in Kakisa, Northwest Territories, Canada

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Traditional food systems are central to cultural continuity, sustainable livelihoods, and food security for Indigenous communities in northern Canada. However, these systems are threatened by climate change, rising costs, and increasing reliance on purchased foods. At the same time, climate change presents opportunities to diversify through small-scale food production. Such initiatives can enhance food security and self-sufficiency but require tools that integrate Indigenous values and systems thinking. This research introduces the Community Agroecological Values Framework as a novel model for describing local food systems and guiding transformation in northern regions by prioritizing Indigenous values in community-led planning. In partnership with the Ka'a'gee Tu First Nation, this participatory action research uses qualitative methods to describe the current state of the community's food system and outline a future vision and path to achieving community defined food system goals. Community members highlighted the need for increased access to local foods, greater youth engagement, and support to develop sustainable gardening skills. Insights informed the development of the Community Agroecological Values Framework, which builds on the Community Capitals Framework and Northern Agroecology to create a harmonized, systems-based and values-oriented planning framework and planning tool. This tool centers Traditional Knowledge and cultural values including land stewardship, reciprocal relationships, collective betterment, food sovereignty, self-determination, and intergenerational knowledge sharing, empowering communities to design and implement more resilient, culturally grounded, and self-sufficient food systems.

KEYWORDS

agroecology, northern food systems, Indigenous Knowledge, Community Capitals Framework, participatory action research

1 Introduction

In northern Canada, traditional food systems sustain Indigenous communities, by supporting cultural continuity, sustainable livelihoods, and food security (Wilson et al., 2020). These systems include sustainable harvesting—hunting, fishing, trapping, and foraging—as well as sharing food from the lands, skies, and waters, referred to as 'the Land', capitalized to emphasize Indigenous perspective of Land as alive, as spiritual, emotional, in relationship with self, and the building blocks of place and meaning-making (CCA, 2014; Styres, 2018). They depend on relationships with nature, Traditional Knowledge, participation, and financial capacity for supplies and transportation (CCA, 2014). However, social, economic, and political disruptions to traditional food systems pressures are forcing a shift toward ultra-processed, retail foods (Delormier and Marquis, 2019; Little et al., 2021; Ramirez Prieto et al., 2022). Climate change amplifies these challenges by accelerating permafrost thaw, altering flood and drought cycles, intensifying forest fires and invasive species proliferation, and shifting keystone species migration routes (Lawrence et al., 2015; Schuur and Mack, 2018; Wilson et al., 2020; Hancock et al., 2022). These stressors threaten traditional food system sustainability, requiring adaptive, community-led strategies that strengthen land-based practices to maintain food security, cultural traditions, ecological integrity, and Indigenous self-determination (Spring et al., 2018; Kuhnlein and Chotiboriboon, 2022).

To address these challenges, many Indigenous communities across northern Canada are transforming their food systems, prioritizing safety, stewardship, Traditional Knowledge transmission, and access to traditional foods (Natcher et al., 2014; Kamal et al., 2015a; Robidoux and Mason, 2017; Spring et al., 2018; Settee and Shukla, 2020; Poirier and Neufeld, 2023; Ramirez Prieto et al., 2023; Spring et al., 2023). Climate change is also creating expanded opportunities for new forms of food production that have the potential to support adaptation and food sovereignty (Lamalice et al., 2018; Spring et al., 2018; Thompson et al., 2018; Chen and Natcher, 2019; Ross and Mason, 2020).

The Canadian North has long been imagined as an agricultural 'frontier' (Hannah et al., 2020; Price et al., 2022; Price, 2023). Settlers in the Northwest Territories (NWT) experimented with agriculture dating back to the late 1700s, however social, political, infrastructure, and environmental challenges have historically limited the industry's expansion. In the 1900's the church and colonial government used agriculture as a tool to assimilate Indigenous people in the region, through residential school education, settlement policies, and community agriculture programs (Price, 2023). These experiences have had lasting negative impacts on Indigenous families, particularly among residential school survivors, creating challenges for communities considering agriculture as a new form of food provisioning. Today, agriculture remains a minor contributor to the regional economy (Lemay et al., 2021) and despite evidence of widespread garden infrastructure across the region (Chen and Natcher, 2019), it is uncertain whether these programs have remained in operation since the COVID-19 pandemic, or the extent to which the gardens contribute to community food security. Commercial agriculture operations, particularly those situated in the South Slave region, have been significantly impacted or eliminated by extreme flooding and wildfire events since 2021.

Furthermore, because northern landscapes are highly vulnerable and converting forests to farmland risks ecosystem degradation and carbon release, worsening climate change (Hannah et al., 2020; Bysouth et al., 2021), communities are challenged to ensure new practices do not harm traditional food systems, ecosystem health, or community well-being (Price et al., 2022; Tsuji et al., 2023). Addressing these challenges requires tools that help communities define and evaluate food system functions and develop strategies to achieve well-being goals. This research outlines the Community Agroecological Values Framework (CAVF), a tool to support planning for community-led sustainable food system transformation in the North and potentially elsewhere.

Agroecology offers a sustainable food systems approach that integrates science, practice, and social movements (Wezel et al., 2009, 2020) and aligns closely to food sovereignty (Pimbert, 2018; Anderson et al., 2019). It promotes continual transformation- a shift toward a food system that upholds the ecological and social principles and values of people and place, and prioritizes bottom-up governance and community-centered agency (Nicholls and Altieri, 2018; Anderson et al., 2019). Agroecology emerged as a feature of rural development and resistance to corporatization and industrialization of the food system across Latin America in the 1970s and 1980 (Altieri and Nicholls, 2017; Gliessman, 2018). It has since gained traction globally among Indigenous and subsistence farmers, pastoralists, and fishers as it incorporates Traditional Knowledges, relationships with people and nature, and practices that predate contemporary notions of the approach into food production systems, and inform current agroecological science and practice (Holt-Giménez and Altieri, 2013; Ertör et al., 2015; Altieri and Nicholls, 2017; Pimbert, 2018; Laforge et al., 2021). Defined as "the integrative study of the ecology of the entire food system, encompassing ecological, economic, and social dimensions" (Francis et al., 2003, p. 101), agroecology has also come to focus political economy challenging the power dynamics that drive the existing corporate food regime (Gliessman, 2018). In Canada, agroecology is emerging as a response to compounding food system crises (Isaac et al., 2018; Laforge et al., 2021; Bowness et al., 2024). In the North, where subsistence and commercial food production are increasingly viable, discussions center on sustainability and Indigenous food sovereignty (Hannah et al., 2020; Wilson et al., 2020; Lemay et al., 2021; Price et al., 2022; Price, 2023; Spring et al., 2025). Agroecology contributes to this conversation as its principles align with Indigenous-led food sovereignty and land struggles in the region (Isaac et al., 2018; Johnston and Spring, 2021; Laforge et al., 2021; Price et al., 2022; Spring et al., 2025). Considering the emergent nature of northern agriculture and the importance of traditional food systems to northern communities, agroecological transformation in this context involves reversing the nutritional transition toward the consumption of ultra-processed, store-bought foods by continuing to sustainably harvest traditional foods while also seeking alternatives to account for the harvest uncertainties and increased safety risks associated with land-based activities brought on by climate change (Spring et al., 2020; Ramirez Prieto et al., 2022; Slack et al., 2025). This includes adopting agroecology adapted to the northern context by drawing on principles of care for people and the Land inherent in Dene traditional food systems and worldviews.

Food systems interact with natural and human systems, playing a key role in addressing complex challenges and achieving community goals (Blay-Palmer et al., 2014; Nguyen, 2018). Systems-oriented tools like the Community Capitals Framework (CCF) use asset-based methodologies to evaluate local development initiatives (Bebbington, 1999; Flora et al., 2004; Emery and Flora, 2006). In northern Canada, these tools have been used to identify factors shaping local food

systems, supporting Indigenous communities in adapting to and mitigating climate change impacts on traditional food systems (Spring et al., 2018, 2023; Snider, 2021).

To promote sustainable and equitable food systems, models such as Northern Agroecology (NA), which was developed in conversation with Ka'a'gee Tu First Nation (KTFN) Knowledge holders, provide a pathway to transform food system dynamics while reinforcing existing values including land stewardship, reciprocal relationships, collective betterment, food sovereignty, self-determination, and intergenerational knowledge sharing (Price et al., 2022). The CCF, combined with agroecology, can help identify potential pathways for achieving this transformation.

The purpose of this research is to develop a framework for planning and assessing northern food systems that integrates Indigenous values and principles to identify pathways toward achieving community food system goals. To achieve these ends, we explore whether the CCF and NA, when used together, adequately reflect Dene cultural values when addressing food security, climate change, and community well-being challenges, asking, can the CCF and NA be adapted to reflect Dene values while addressing interconnected challenges of food system sustainability, food sovereignty and well-being in northern Indigenous communities? We first outline the CCF and agroecology as theoretical concepts and describe how they have been applied in a northern context. Using data collected through a document review, a workshop, participatory mapping and storytelling, we examine KTFN's food system using the CCF and describe how it is being enhanced based on Dene values, a key component of NA. Finally, we discuss CCF and NA challenges in assessing food system sustainability in the North. In response, we introduce the Community Agroecological Values Framework (CAVF), a novel community-led food system model that integrates Indigenous values into a planning process to support communities in achieving their food system goals. The authors developed the CAVF through an iterative process during the design of KTFN's food system action plan (KTFN and Temmer, 2024). The CAVF builds on prior community-led research using asset-based frameworks including the CCF (Spring et al., 2018; Snider, 2021), while engaging with NA discourse (Price et al., 2022; Spring et al., 2025) in response to community-identified shortcomings of existing asset-based frameworks. The CAVF is a novel approach to food systems analysis as it combines systems logic of the CCF and Indigenous values foundational to NA to amplify community values throughout the planning process.

2 Literature review

2.1 Community capitals framework

The CCF was developed in the early 2000s to assess progress in community development (Flora et al., 2004; Emery and Flora, 2006). It builds on the Sustainable Livelihoods Approach (SLA), which emphasizes capability, equity, and sustainability as core components of sustainable rural livelihoods. Households enhance their livelihoods by accessing resources or 'capitals' (Chambers and Conway, 1992; Scoones, 2009). Sustainable livelihoods are defined by Chambers and Conway (1992) as:

> … the capabilities, assets (stores, resources, claims, and access) and activities required for a means of living: a livelihood is sustainable which can cope with and recover from stresses and shocks, maintain or enhance its capabilities and assets, and provide sustainable livelihood opportunities for the next generation; and which contributes net benefits to other livelihoods at the local and global levels and in the short and long term (p. 6).

Expanding the SLA to the community scale, the CCF applies a systems lens to assess community development efforts across seven capitals: cultural, social, human, built, natural, financial, and political (Table 1) (Flora et al., 2004; Emery and Flora, 2006; Pigg et al., 2013). These capitals form dynamic relationships that contribute to healthier, more resilient, and sustainable communities (Pigg et al., 2013; Spring et al., 2018). The CCF identifies capital assets, their investments, impacts, and interactions with other capitals. Investments in one capital can drive positive changes in others, a process Emery and Flora (2006) term 'spiraling up'. While some critique this as oversimplified, evidence supports leveraging one or more capitals to advance community progress (Pigg et al., 2013). Understanding the contexts that shape relationships among the capitals is key for developing strategies (Pigg et al., 2013; Mueller et al., 2020). Flora et al. (2004) stress balancing capitals, cautioning that overemphasis of one capital can deplete others, potentially weakening a community's sustainability.

Asset-based frameworks such as SLA and CCF have been used extensively to assess the progress of community development interventions globally (e.g., Isabel Gutierrez-Montes et al., 2009; Stone and Nyaupane, 2018; Taylor et al., 2023) including the Arctic and Sub-Arctic (Kamal et al., 2015b; Riabova, 2017; Berman et al., 2021; Snider, 2021; Cook et al., 2022). In Spring et al. (2018, 2023), the authors highlight how northern communities can use the CCF to

TABLE 1 Description of the CCF capitals categories [adapted from Emery and Flora (2006) and Spring et al. (2018)].

Capital	Description
Natural	Place-based assets that occur naturally such as natural resources (e.g., minerals, forests, bodies of water), amenities, and natural beauty. It can also include geographic location (e.g., urban, rural, remote).
Financial	Financial resources that can be accessed to invest in capacity-building, economic development, and social/civic programming. This also includes local economies where sharing, trading, and buying/selling occur.
Human	People's skills and abilities to access and enhance resources and knowledge within and outside of their community to increase understanding identify promising practices and build community.
Social	The networks and connections of people and organizations can be utilized to create change.
Cultural	The way people 'know the world' Includes traditions and language, power dynamics that influence collaboration across ethnicities and generations, individual voices, and influence, and how creativity, innovation, and influence emerge and are nurtured.
Political	Connections to resources and power brokers, access to power and organizations. The ability of individuals to find and use their voices to contribute to community betterment.
Built	The physical infrastructure that supports the use of other capitals to advance the process of community building.

build food system resilience by identifying how the capitals interact within the local food system and determining how adaptation activities can help communities respond to climate change stressors. The authors worked in the NWT with K'a'gee Tu First Nation (Spring et al., 2018), and the community of Deline (Spring et al., 2023) to identify capital stocks the future to foster climate resilience within these food systems.

2.2 Agroecology

Agroecology is a sustainable food systems approach that is transformative and adaptable across environmental, socio-cultural, and economic contexts (IPES-Food, 2020). It has evolved into three interconnected manifestations—science, practice, and social movement—offering a transdisciplinary, participatory, and action-oriented approach to equitable and sustainable food systems (Francis et al., 2003; Wezel et al., 2009, 2020; Tomich et al., 2011; Sevilla Guzmán and Woodgate, 2013; Altieri and Nicholls, 2017; Gliessman, 2018). Initially focused on on-farm ecological production, agroecology has expanded to a food systems approach, termed 'the ecology of food systems' (Francis et al., 2003; Wezel and Soldat, 2009). It explores balance within the sustainability nexus (economy, society, environment) (Wezel et al., 2009) and considers interactions across scales from field plots to global agroecosystems. Simply stated, "Agroecology seeks to transform food and agriculture systems, addressing the root causes of problems in an integrated way and providing holistic and long-term solutions" (FAO, 2019, p. 2).

The IPES-Food (2020) identifies five agroecology dimensions: agronomic practices, economic paradigm, science and knowledge, social dimensions, and governance. In 2019, the High-Level Panel of Experts on Food Security and Nutrition (HLPE-FSN) synthesized agroecological principles into a framework of 13 principles. They expanded on the FAO's 10 elements of agroecology while incorporating Gliessman (2007) sustainable food system transition process and the scales of action (field, farm, or agroecosystem, and food system). These principles are categorized into three operational principles: enhancing resource efficiency, strengthening resilience, and securing social equity and responsibility (Wezel et al., 2020).

In 2022, Sambaa K'e First Nation (SKFN) and KTFN collaborated with Price and colleagues to conceptualize NA, aligning Dene values with emerging food production systems in Indigenous communities across the NWT. This approach supports KTFN's commitment to producing food that enhances ecosystem health and community well-being (Spring et al., 2020, 2025). NA was modeled on the five dimensions of agroecology put forth by IPES-Food (2020). Adaptations contextualizing NA emphasize land stewardship by considering land-based food harvesting activities and agriculture; recognition of the multidimensional nature of the northern food economy, where food trading and sharing are essential for food provisioning and distribution; and acknowledging Indigenous land and food sovereignty as governance issues (Price et al., 2022). KTFN and SKFN assert that northern-style agroecology should: be based on Indigenous stewardship principles; integrate food production, sale, trade, and sharing within the traditional food system and social economy of food; and apply local Indigenous ontologies, struggles for self-determination, and land rights into existing agroecology principles (e.g., Wezel et al., 2020). These First Nations emphasize that "through the framework of agroecology, the North can be a model of regenerative and restorative food systems that include agriculture and traditional foods while protecting Indigenous territorial rights" (Price et al., 2022, pp. 11–12). Table 2 provides an overview of NA adapted from IPES-Food (2020) dimensions of agroecology in Africa.

TABLE 2 Description of elements of the framework for northern agroecology.

Framework for northern agroecology	
Stewardship	Healthy people, healthy land; hunting, gathering, growing
Economies	Food-sharing and trading; support for sustainable local livelihoods
Knowledge	Traditional Knowledge; community-led research; two-eyed seeing
Social dimensions	Culture; language; youth and elders
Governance	Self-governance; solidarity networks; land and food sovereignty

Source: Price et al. (2022).

3 Materials and methods

3.1 Research approach

This research contributes to a long-standing Participatory Action Research (PAR) initiative with KTFN and emphasizes Indigenous Research Paradigms (IRP) of relationality and relational accountability (Wilson, 2008) which are fostered through self-reflection, shared experiences, open dialog, and collaboration to achieve mutual goals. To date, KTFN and researchers (including the authors) have initiated eight community-led PAR projects contributing to KTFN's climate change adaptation and food security goals: household and fish waste composting (Snider, 2021), soil analysis for agricultural suitability (Bysouth, 2023), a community garden (Malandra, 2023; Temmer, 2025), a fuel break berry project (Johnston, in preparation), a food hub (Rodriguez Reyes, 2024), a harvester safety app, and map of KTFN's territory with place names in *Dene Zhatié* (Kok, 2020; Jayaratne, 2021), and participatory mapping to develop a resilience strategy to address climate change impacts on traditional harvesting territories (Kerubo Ombwori, 2025).

PAR is an effective approach to Indigenous-settler research collaborations can create an atmosphere of trust and respect, supporting impactful research and action outcomes it promotes shared power, decision-making, community capacity building, co-learning, and knowledge sharing for community benefit (Kemmis, 2010). PAR integrates IRPs, reinforcing relationships of trust, reciprocity, relationality, and respect (Wilson, 2008; Castleden et al., 2012). This requires time, resources, capacity, and long-term commitment before substantial change occurs, along with patience,

flexibility, humility, and self-reflection. While PAR is derived from colonial interpretations of good community research practices (Smith, 2021), it facilitates a safe space for integrating diverse ways of knowing, doing, and relating for community well-being, a key tenet of IRPs (Kovach, 2021; Denscombe, 2025). PAR creates a space for IRPs and Western paradigms by cultivating relationships that empower communities to determine the research agenda and guide the process (Grimwood, 2015; Smith, 2021). Using this approach, over time, KTFN and researchers have built lasting relationships built on the four Rs of Indigenous research (respect, reciprocity, relevance, and responsibility) that are strengthened with each subsequent project, friendship, and study, forming a partnership (Castleden et al., 2012; Leeuw de et al., 2012).

As part of PAR's iterative cycle of planning, acting, observing, and reflecting (McTaggart et al., 2017), this research builds KTFN's initial efforts to address climate change impacts on their traditional food system through planning and action (Spring, 2018) and marks the start of a second iteration of this PAR cycle. The CCF was initially used as framework for analyzing KTFN's food system in 2013 (Spring et al., 2018). Put forth by KTFN and SKFN, NA is framing and vision for agriculture in the North that embeds food production processes with Dene values that ensure land stewardship, community well-being and food sovereignty (Price et al., 2022). These theoretical frameworks were chosen as a natural progression of KTFN's on-going PAR initiatives. Part of a broader study, this research critically examines the CCF as a tool to describe and assess progress toward KTFN's food system goals and suggests that incorporating NA as an additional framing can better describe how community assets are enhanced to more accurately describe community's vision for food system sustainability.

As we move forward in our partnership we are reflecting on our collective understanding of research and its purpose. To this end, throughout this research we have drawn on the conceptual underpinnings of agroecology which incorporate reflexive and action-oriented processes, empowering communities to dismantle power structures and embrace multiple ways of knowing to transform food systems (López-García et al., 2021).

3.2 Positionality

JT and AS are settler scholars from Southern Canada. JT has collaborated with Indigenous communities nationally and internationally to drive local adoption of agroecology and AS has worked with Dene communities in the NWT extensively to support community-led action for sustainable food systems. Both authors have strong relationships with KTFN, having lived and collaborated with the community on food system and climate change adaptation projects over multiple years. RS and LC are Dene and KTFN community members living in Kakisa, KTFN's sole community. As the band manager and KTFN Chief, they play pivotal roles in Kakisa's development and well-being. In collaboration with KTFN, JT conducted this research, including data collection and analysis, as part of their doctoral studies. AS, LC and RS supported all research activities including the research questions and objectives development, methods and data collection design, data analysis and interpretation, and knowledge product development. In addition, Kakisa community members contributed to this study as collaborators on research and action projects.

3.3 Community description

The Ka'a'gee Tu First Nation (also spelled *K'ágee*) spans approximately 10,000 km^2 in the Dehcho region of Denendeh (NWT, Canada), within the Treaty 11 land claim region and the Taiga Plains Ecoregion (Government of the Northwest Territories, 2009). With about 40 residents, KTFN's community, Kakisa, is the smallest settlement in the territory (Statistics Canada, 2023). While English is predominantly spoken, the community is actively working to revitalize their ancestral language, *Dene Zhatié* (South Slavey). The community has a band office, community hall, a K-12 school, and a cultural camp. There are no water or sewer systems; thus, potable water is trucked twice weekly from Hay River, 280 km to the south.

In Kakisa, most households balance wage employment with traditional livelihoods, engaging in land-based activities such as traditional food harvesting and participating in traditional food-sharing networks. Community members access food from traditional harvesting and sharing, purchasing food from the store, and accessing it through the community garden.

Traditional foods such as moose, duck, beaver, fish, small game, berries, and medicinal plants are harvested when in season. These foods are shared in Kakisa and across the region. As Kakisa has no store, community members travel to Hay River to purchase food and access services. Since 2013, KTFN has collaborated with researchers to adapt their local food system to address climate change impacts and food security issues including development of a community garden. The community has two greenhouses, a 0.25-acre field plot, nine raised beds, a toolshed, and a gazebo. Food grown in the garden is shared with households at no cost (Figure 1).

3.4 Data collection

Data collection included a review of academic and grey literature, participatory mapping and storytelling, a community workshop, as well as personal observations and notes from meetings and conversations with community members.

3.4.1 Document review

The document review involved an examination of theses and academic articles published through the community-research partnership and KTFN community planning documents. In total, we reviewed six theses (Spring, 2018; Kok, 2020; Jayaratne, 2021; Snider, 2021; Bysouth, 2023; Malandra, 2023), four academic articles (Simba and Spring, 2017; Spring et al., 2018; Johnston and Spring, 2021; Price et al., 2022) and four community plans (KTFN, 2014; Ka'a'gee Tu First Nation, 2018, 2020; KTFN and Johnston, 2021). One additional thesis (Rodriguez Reyes, 2024), was reviewed after the workshop to help confirm and contribute detail and context to the

FIGURE 1
Map of Kakisa, NT.

CAVF. We identified elements connected to food system goals and priorities, activities, food system action research projects, as well as resource and capacity needs and recommendations for food system project success.

3.4.2 Workshop and feast

In June 2023, the community and researchers gathered in Kakisa to assess the current state of the food system and plan future projects. The event included a workshop, a feast, a garden volunteer session, and field trip. The workshop was attended by 15 community members, approximately half of all adults, reflecting on community-researcher relationships, trust among partners, and the effectiveness of PAR in this context. The workshop agenda was developed with community partners to ensure contributions in discussions and decision-making. Participatory sessions including strategic visioning (Lachapelle et al., 2010), community asset mapping (Kramer et al., 2012), and world café[1] (Recchia et al., 2022), engaged participants in dialog, involving them in the co-creation of knowledge, encouraging ownership and agency, and amplifying diverse voices (McTaggart et al., 2017). A feast was held to ground the research in community customs and celebrate progress.

During the visioning activity, community members were asked to draw and write on colour coded Post-it notes indicating current positive and negative food system attributes and place them in the 'now' category. Next, community members identified the positive attributes and moved them to the 'future' category. Finally, positive food system attributes or descriptions of their desired future food system vision were written and added to the 'future' category.

For the community asset mapping session, community members worked in groups to design two maps; one including all assets or capitals available in the community that can be used to advance food system projects, and one that identifies regional and extra-regional assets. Using this strengths-based approach, community members were encouraged to consider local resources and how they can assist in achieving the new food system vision.

Finally, a World Café was used to engage community members in conversation about how NA principles and Dene values can be integrated into their food system action plan (Temmer et al., In review). Community members travelled to five stations representing key community food projects: community garden; food hub; fuel break farm and food forest; zero waste and composting; and on-the-land camps, harvester safety, and participatory mapping. Questions at each station were designed to prompt community members to discuss how northern agroecology principles, modelled after Dene values, can be considered when implementing each food action project.

1 World Café is a structured and inclusive participatory data collection tool whereby participants generate new ideas and solutions as they travel to multiple stations to discuss pre-determined topics with scripted questions (Lohr et al., 2020; Recchia et al., 2022).

3.4.3 Participatory mapping and storytelling

Between April and June 2023, households took part in a participatory mapping and storytelling activity to describe KTFN's food-based social economy, focusing on regional food security, kinship networks, and contributions to sustainable livelihoods (Moulaert and Ailenei, 2005; Nelson and Stroink, 2020). Participatory mapping and storytelling sessions included one or more members of each household. In total, 13 out of the 14 households participated in interviews lasting between fifteen minutes to one hour. One household was unavailable during the data collection period but did contribute at a later date for community archival purposes. Participants were presented printed maps of the region to be used as a visual cue to indicate the communities where they share, receive, trade, and, in the case of fish, sell traditional foods. Questions aimed to support the development of a regional traditional food sharing map. At the end of the mapping exercise, community members were invited to tell stories and discuss the importance of sharing food. Storytelling is a culturally significant way of sharing knowledge among Indigenous communities and ensures that memories, knowledge and values are passed on to future generations (Kovach, 2021; Smith, 2021). To recognize the importance of this knowledge to the community, the sharing maps, stories and photos were collected and collated into a digitized and printed story map for community members and KTFN archives.

3.5 Analysis

Documents were analyzed to identify key information on food system goals, activities, projects, and needs, contributing to an updated description of the food system prior to collecting primary data for this research. A summary of the document review was shared with community members at the start of the workshop to confirm the information's continued relevance in the present context. Data from the visioning session, collected during the workshop and feast, were divided into existing positive and negative aspects of the food system and suggested future scenarios, to form KTFN's food system vision. Next, data from the visioning and asset mapping exercises were organized based on the CCF categories to update findings from Spring et al. (2018). Data points were evaluated based on participants' perspectives as elements that improve (+) or degrade (−) the food system.

During the asset mapping workshop, community members encountered limitations describing how CCF assets could be used to improve the state of their food system. Although the CCF offered a holistic way to visualize the food system, the language used, such as 'assets' and 'resources', did not align with how participants view their food system. Subsequent conversations about NA facilitated through the world café helped to adjust terminology and shift the conversation from assets to relationships and community values. To assess how the CCF elements can contribute to the community's vision for agroecological food system transformation, we organized data from the world café based on NA categories and supplemented those results with findings from the participatory mapping and storytelling sessions. Considering the applicability of the NA dimensions have yet to be tested, and to remain consistent with the CCF analysis conducted by Spring et al. (2018), the authors mapped the NA dimensions on to the CCF categories.

To develop the CAVF categories a comparative thematic analysis was conducted using data from the community asset mapping and world café sessions, and from storytelling manuscripts. First, data was organized according to both CCF and NA dimensions. Emergent themes within each category were identified. Next, we assessed points of alignment and divergence between the CCF categories and NA dimensions based on shared data points. Where alignment was evident, a CAVF dimension was formed drawing on existing NA descriptions and the emergent themes. These dimensions included: Land and Water Stewardship, Economies, Relationships, and Governance. We renamed CAVF categories to reflect local language and emergent themes drawn from participant input.

In cases where divergence between the frameworks existed, we used the thematic analysis of world café data to inform the development of the CAVF categories. For example, we separated the NA Knowledge dimension into two distinct dimensions: Traditional Knowledge and Culture and Skills and Capacities. This distinction reflects the community values around different forms of knowledge. Traditional Knowledge is deeply tied to Dene identity and culture, while Skills and Capacities are viewed as important for overall food system function and adaptation. While both knowledges are valued, they serve distinct roles in supporting the community's food system goals.

Additionally, we incorporated the Supportive Infrastructure dimension into the revised NA framework. This dimension emerged as an important theme in community discussions yet was not considered in preliminary NA dimensions proposed by Price et al. (2022). Table 3 offers a comparison of the CCF categories and NA dimensions in addition to the revised NA dimensions which are the building blocks of the CAVF.

Finally, we derived descriptions for each CAVF dimension from community input during world café and asset mapping sessions. We compared the existing NA dimension descriptions with emergent themes to verify NA descriptions and contribute new insights into each CAVF dimension. This process ensured that the CAVF dimensions reflect community values and relational understandings of the food system dimensions and offer practical guidance to develop strategies to transform the food system and achieve self-sufficiency goals. These themes are summarized in Table 4.

TABLE 3 Comparison of community capitals categories and revised northern agroecology dimensions (CAVF).

CCF categories	NA dimensions	Revised NA dimensions (CAVF)
Natural	Stewardship	Land and water stewardship
Cultural	Knowledge	Traditional knowledge and culture
Human		Skills and capacities
Social	Social dimensions	Relationships
Political	Governance	Governance
Financial	Economies	Economies
Built		Supportive infrastructure

3.6 Data validation and ethics

Prior to participating in the research, community members were given an overview of the research and provided informed consent, including the use of names associated with stories and quotes. All workshop, mapping and storytelling sessions were recorded and transcribed, and workshop materials and maps were digitized and saved to support analysis and plan development. Community members reviewed draft documents to confirm results, including validating the CAVF categories and themes, and approve quotations and reaffirm their consent provided during data collection sessions. Initial findings were shared in summer 2024 through individual follow-up conversations, allowing for reflection and response. In keeping with OCAP (Ownership, Control, Access, and Possession), First Nations data governance principles, KTFN leadership collaborated on the design of questions and data collection methods. All raw data is stored on a password protected cloud storage that members of the research team, including KTFN partners, can access. JT and developed plain-language food system action plan using the CAVF as a guide (KTFN and Temmer, 2024) to support the community's food goals, and a regional food sharing map. These documents were finalized by the authors and shared with KTFN leadership in fall 2025. The research methodology, developed collaboratively with KTFN leadership, received approval from the authors' University Research Ethics Board and Aurora Research Institute, the NWT research licensing body.

4 Results

4.1 Self-sufficiency, well-being, and land stewardship as the foundations of KTFN's food system transformation

KTFN's understanding of their food system has deepened since 2013, when they began discussing how to adapt their traditional food system to safeguard it against climate change's impacts on the Land (Spring et al., 2018). However, the community's main goal, self-sufficiency, has remained the same:

> A secure, healthy, and satisfying lifestyle for all members of the community – rooted in traditional values, a clean environment, personal wellness, good governance, and expanded educational and economic opportunities (KTFN, 2014, n.p.).

Self-sufficiency is intrinsically connected to well-being, described as "*a secure, healthy, and satisfying lifestyle for all members of the community…*" and to land stewardship, denoted as a "*a clean environment*". One community member shared during a food project planning meeting that they view their food system as crucial for enhancing community well-being. Community-based research conducted in Kakisa outlined similar findings. Snider (2021) highlighted self-sufficiency, care for the Land, and traditional teachings as key benefits of the KTFN fish waste composting program. Meanwhile, Malandra (2023) found that the community garden program aimed to grow food to increase self-sufficiency and care for the Land and community. KTFN has also highlighted these themes during discussions about the importance of Dene cultural values for agroecological fisheries and agri-food systems management in the North (Price et al., 2022; Spring et al., 2025).

In Kakisa, self-sufficiency is advanced as the community stewards healthy Land and people by reducing waste and caring for the environment; practicing Dene culture, knowledge, and values; strengthening social bonds; improving skills and education through multiple ways of knowing; generating sustainable livelihoods through employment and land-based activities; practicing good governance at home and across the region; and being intentional about infrastructure and tools used for projects.

4.2 Advancing KTFN's food system goals with northern agroecology

KTFN views the food system as being in relationship with all community systems, or community capitals, serving as an entry point to promote and safeguard healthy Land and people (Spring et al., 2018). The revised NA dimensions described in this section offered guidance on how to advance self-sufficiency goals across the seven community capital categories.

4.2.1 Natural capital- land and water stewardship

Community members identified natural capital, or the Land, as the foundation of their food system, which includes all components of the natural world. The NA dimension, Stewardship of the Land, was considered a key Dene principle and community priority. Engaging in land-based activities such as hunting, fishing, gathering, growing, and sharing food, along with reducing household waste, reflects care for both Land and people. Successful harvesting of traditional food requires healthy relationships with self, family, and nature, built on reciprocity, cultural values, trust, and respect for the Land and people. As one Elder explained, food from the Land is medicine that contributes to holistic health. Traditional food as medicine demonstrates the reciprocal relationship between humans and nature, highlighting the responsibility to care for one another.

> My dad always talked about the moose, and its food was willow and [lily pads]. It's one of their favorite foods in summer. You know and he said that all the animals eat different roots, different berries and everything and they have special vitamins for us. So, he told us to think that way. That they need to eat their portion too. So that everything is healthy when we take them and we use them for food, so that's what I think (Margaret Leishman, Elder).

4.2.2 Political capital- governance

KTFN improves political capital through the NA governance dimension in respect to the Land and food system through collective initiatives such as the Dehcho Guardians program (DFN and Government of Canada, 2018) and by leveraging political influence to advocate for land and resource ownership via negotiation processes like the Dehcho Process (DFN, 2015). KTFN is also working to designate a part of its territory as an Indigenous Protected Area (Johnston and Spring, 2021; Government of the Northwest Territories, 2020). Furthermore, KTFN's food system goal of achieving self-sufficiency is directly connected to self-determination. At the local level, community members contribute to this goal by participating in land-based activities, utilizing Traditional Knowledge to assess ecosystem health, exchange information, and adapting food harvesting practices. Chief Chicot shared.

> It's not just sharing food but also information…one of the other things they do is when they [community members] go out [hunting], they check for berries and that kind of stuff… they'll say there's lots of berries over there and we usually end up going [to pick them] (Lloyd Chicot).

4.2.3 Social and cultural capitals- relationships and traditional knowledge and culture

When engaging in stewardship activities, community members leverage social and cultural capital, referring to them as relationships, and Traditional Knowledge and culture. In Kakisa, cultural resurgence, or enhancing cultural capital stocks, is achieved by engaging in land-based activities, consuming traditional foods, encouraging Elder and youth interactions, and (re)learning to speak Dene Zhatié. When time is spent together on the Land, community members celebrate their culture and help to rebuild and redefine healthy relationships with self, family, community, and nature. Activities like hunting, fishing, trapping, and harvesting berries and medicinal plants strengthen relationships as community members share knowledge, stories, language, and food.

These social and cultural activities contribute to improved health outcomes, enhance coping mechanisms, and foster a sense of belonging. They also support ongoing formal monitoring and stewardship programs like the Dehcho Guardians that use two-eyed seeing, monitoring and analysis that incorporate Traditional Knowledge and Western Science (Bartlett et al., 2012), to ensure the health of KTFN territories, the community's natural capital. These activities also facilitate the transfer of Traditional Knowledge and skills across generations.

> Everybody comes out and they bring out, lay out all the moose meat on tables and we always like to have a big plate, like a big boiling pot of water, like a big pot, and we'll just put all the moose head and good parts and distribute all the meat evenly among each other's families, even the ones that live in [Ft.] Providence and beyond… It's fun to see everybody come together and like to have conversations over a good meal or just stories, and that's how you get knowledge of like, the animal parts. That's when they bring up stories with the old days of how people used to all come into this community like from Trout Lake [Sambaa K'e First Nation], [Ft.] Providence, all around. They always used to come here. This [Kakisa] is the central place (Terri Simba).

4.2.4 Human capital- skills and capacities

Human capital, referring to the skills and capacities, is nurtured when diverse ways of knowing are valued to foster the skills necessary for change. With NA, one way investment in human capital occurs is through PAR (Méndez et al., 2017). PAR integrates Traditional Knowledge, cultural values, and community priorities into the research, enhancing community skills to support action projects. Through this PAR research, community members gained skills in systems planning and design as they co-designed the CAVF, a food system framework that bridges a Western assessment model, the CCF, with and Indigenous values-based framework, NA.

Community members also gained skills and capacities as they engaged with on-going action projects such as the community garden. In initial community discussions, (Spring et al., 2018) observed that limited knowledge of food cultivation was a barrier to establishing a sustainable food production system. At that time, an Elder expressed "*If people could come and make a garden and show us how to do it. We could do it; we could weed and water it and stuff like that…*" (p. 130). Interviews and community dialogs continue to emphasize this need. During the workshop, an Elder recommended that training manuals and documentation would help share knowledge about food cultivation in the North.

> If people do not know what to do [in the garden], they can fall back on the computer [recorded documentation] (Leon St. Pierre, Elder).

Responding to community requests for garden skills training, regional gardening skills training sessions were organized in 2022 in Sambaa K'e and in 2025 in Kakisa. Trainings aimed to enhance existing relationships, Traditional Knowledge, and cultural bonds while expanding skills through hands-on learning. Although similar training sessions were scheduled for 2023 and 2024 wildfires disrupted travel plans. Sessions were well attended and valued; evidenced by community members inquiring about more garden training sessions in subsequent field seasons.

4.2.5 Financial capital- economies

Indigenous communities across the North have historically integrated capitalist and Indigenous economies by blending cash exchange for goods and services with sharing-based practices, while maintaining the values and traditional activities of Indigenous economies, forming what is referred to as the mixed economy (Abele, 2009; Natcher et al., 2022). Kakisa's local economy is tied to the food system and among households, financial capital enhanced by NA economies through participation in the mixed economy and by supporting sustainable livelihoods. Community members engage in sustainable livelihood activities, such as food sharing and trading, and work in local administration and maintenance jobs through the Band Office, and regionally in healthcare and natural resource sectors. The mixed economy supports social and cultural capitals as individuals share and trade traditional and garden foods with through extended kinship networks. Sharing and trading are important to Dene culture; sharing with others is a sacred Dene Law that promotes social connections, reciprocal relationships, and cultural continuity (Walsh, 2016). Interviews highlighted that food sharing in Kakisa is a core value passed down through generations and is essential for maintaining healthy relationships. One community member elaborated on the importance of sharing food:

> It's one of the Dene laws, and sharing food really helps keep that sense of community and that bond with family members you probably do not see that often (Nyah Simba).

Although selling traditional foods like moose and caribou, is considered inappropriate, fish from the community's fishery is sold regionally and plays a part in supporting community members' economic and subsistence livelihoods. Community members shared opinions on the balance between selling some traditional foods like fish to compensate for limited wage-based labour opportunities and to cover the costs associated with modern life:

> There's not much work around here sometimes, so you go to try to figure ways [to] make money because that's what this world's modern days now, it's all about money (Community member, male).

Financial capital is also maintained through access to financial and human resources that can be invested in other capitals. Northern economies are supported by financial capital, enabling access to funding for food system programs. Since 2018, the community-research partnership has been funded through various academic grants and federal and territorial programs. These programs support communities to research and experiment with sustainable agriculture practices and to address food security concerns at the community level. Local economic development initiatives are abundant across the North (Abele and Southcott, 2016) however, funding requires dedicated and skilled individuals, or human capital, to access and administer funds, coordinate programs, and report back. Although accessing government funding may seem to run contrary to self-sufficiency goals, initial outside investments in infrastructure and skills are a necessary step toward projects that are self-sustaining. KTFN is determined to balance the need for financial capital to manage the garden and other food projects, with the value of sharing food and supporting flexible employment and sustainable livelihoods through the food system. One way the community aims to achieve this balance is by creating a food distribution hub, whose purpose will be to share food among KTFN households and to sell excess produce regionally.

4.2.6 Built capital-supportive infrastructure

Supportive infrastructure is commonly considered in the development of sustainable agriculture and community development interventions worldwide (Bishop, 2021), taking a people-centered approach similar to co-learning methods used in agroecology and PAR (López et al., 2017; Pamungkas et al., 2018). Supportive infrastructure is defined for these purposes as physical structures accessed to support community objectives, such as realizing KTFN's food system vision. This aligns with Emery and Flora's (2006) description of built capital in the CCF: "Built capital, finally, includes the infrastructure supporting these [capital building] activities" (p. 21). Experience in Kakisa has shown that technology, infrastructure, and equipment must be developed or selected with community input to ensure they meet local needs and contexts (Shin et al., 2019; Patnaik and Tarei, 2022). For instance, Kakisa's original greenhouses were ill-equipped to withstand heavy snow loads. In 2021, one greenhouse collapsed during a spring snowfall. The plastic covering the remaining greenhouse has lasted only five years because constant sun exposure during long summer days degrades the plastic faster than it would in a more southern latitude. In 2024, a greenhouse better suited for northern climates was installed, providing infrastructure expected to have a longer lifecycle and greater utility for the community. Community members also identified supportive infrastructure as well as appropriate tools and technology such as drones and mapping to enhance harvester safety and land stewardship, a garden drip tape watering system to conserve water and reduce labour, and a community building that supports food hub activities like vegetable box preparation, cooking and preservation training sessions, and community feasts. Table 4 provides a summary of

TABLE 4 Summary of community capitals categories enhanced by northern agroecology and community values.

CCF categories- revised NA dimensions	Community values
Natural capital -land and water stewardship	• Healthy land and people, • Participation in land-based activities, including hunting, fishing, trapping, gathering, and growing, • Have healthy relationships to be on the Land, • Land is medicine, • Land and water stewardship through Dehcho Guardians, protected areas designation, land claim negotiations.
Cultural capital- traditional knowledge and culture	• Cultural resurgence carried out through daily participation in land-based activities and ancestral language use, • Use two-eyed seeing, • Elder and youth interactions are important to pass on traditions and knowledge.
Social capital- relationships	• Healthy relationships with self, family, community, and nature through participating in land-based activities and language.
Human capital- skills and capacities	• Multiple ways of knowing are valued and used to develop skills, • Participatory Action Research, • Skills training for self-sufficiency in growing, harvesting, processing, and sharing garden produce
Political capital- governance	• Solidarity among Dene communities to steward the Land and sustain healthy communities through food system transformations, • Self-determination through self-sufficiency.
Financial capital- economies	• Supports sustainable livelihoods (employment/subsistence), • Participation in the mixed economy (food-sharing, trade, and sale), • Funding for food projects.
Built capital- supportive infrastructure	• Infrastructure is appropriate for the climate and context, • Has multiple uses, • Easy to use and reduces labour needs, • Helps to solve a problem or achieve a goal.

how the CCF categories are enhanced through NA and the community's Dene values.

5 Discussion

Spring et al. (2018) and Spring et al. (2023) illustrate how northern communities use the CCF to enhance food system resilience, demonstrating how capitals interact within the local food system and how adaptation activities help communities respond to climate change stressors. Their 2018 study supported KTFN in establishing a climate change adaptation plan by identifying potential adaptation activities that enhance community capital stocks, mapping capitals connections and interdependencies within the food system, and analyzing stressors on the traditional food system. While KTFN used the CCF to describe their food system, the CCF fell short at offering a pathway toward food system transformation beyond establishing food projects such as the community garden. For example, the CCF did not offer guidance about how to structure the garden according to community values. Critics of asset-based frameworks argue they lack a clear ideology (O'Laughlin, 2002; Snider, 2021), making change processes unclear particularly when donor influences conflict with asset-based models (Small, 2007; Kamal et al., 2015a; Natarajan et al., 2022). Agencies often simplify and reproduce processes rather than nurture complex social transformations embedded in sustainable livelihood approaches (Brocklesby and Fisher, 2003; Scoones, 2009). Chambers and Conway (1992) definition of sustainable livelihoods do push beyond the idea that livelihood strategies focus only on economic asset accumulation, highlighting social relationships, and reliance on institutional structures to access various assets (Ellis, 2008). Bebbington (1999) highlights cultural capital's role in maintaining a shared identity as an empowering asset that enhances well-being. However, interventions aimed at increasing capital stocks may not align with the unique socio-political or biocentric perspectives of the community if applied without a holistic set of guiding principles such as agroecology [Wiggins 2002 in Small (2007)]. Moreover, Scoones (2009) argues that while sustainable livelihood approaches are participatory, power imbalances and the politics of knowledge-making must be considered to ensure local values shape sustainability frameworks.

For example, Kakisa's initial CCF analysis incorporates themes such as "…reconnecting to the Land, taking care of the Land, and growing food…" (Spring et al., 2018, p. 132). However, the concept of a healthy food system remained undefined by the community. Early in the community-research partnership, community members faced challenges defining capital enhancement from a Dene perspective. NA, adapted to place and context (Price et al., 2022), supports efforts to establish a defined 'healthy', and 'sustainable' food system while grounding discussions in a social paradigm that addresses power dynamics and bias in ways that benefit the community.

Although the asset-based frameworks offer systems approaches to community development that enable us to assess the relationships among community systems, experience has shown that their language does not always resonate with community partners (Spring et al., 2018; Snider, 2021). Since NA was co-designed with northern Indigenous communities, including KTFN, it integrates local vernacular and meaning. Discussing food system components from a values perspective also aligns more closely with Dene worldviews, which prioritize fostering relationships over asset usage to achieve community goals.

Agroecology enhances CCF's utility by linking it to Indigenous cultural values. However, despite extensive use in community-based research globally, agroecology remains largely conceptual in Canada, (Isaac et al., 2018; Gliessman, 2019; Bowness et al., 2024) and more so in the North (Price et al., 2022; Spring et al., 2025). With few exceptions, agroecology has yet to be implemented in northern communities (e.g., Sambaa K'e First Nation and Johnston, 2022; KTFN and Temmer, 2024) thus, the framework has not been tested in the field and could require alterations to address local perspectives. For example, this study found the NA framework did not account for discussions about the built environment. Indigenous relationships encompass all aspects of the environment and society, yet discussion on how these relationships connect agroecology and well-being to the built environment are limited. When they do occur, they highlight communities' unmet structural needs such as housing, social and recreational spaces, transportation, water, and sanitation infrastructure, and food access. These deficiencies strain families' physical and mental health, impacting Indigenous quality of life nationwide (Stout, 2018; O'Gorman, 2021). In Kakisa, community members discuss lack of consultation for building design and location, with needs that continue to go unmet. Given their significance to community well-being, NA should include these issues. This illustrates that further research is needed to evaluate NA's broader relevance to Indigenous groups and community applicability across the North.

Meanwhile, the CCF has been successfully applied in a northern context (Spring et al., 2018, 2023) effectively describing complex food systems and linking culture, social networks, and relationships with the natural environment. It also identifies political, economic, and social pressures affecting communities. Although imperfect, these frameworks provide valuable guidance for communities navigating constraints like limited human capacity, financial resources, and engagement in activities that strengthen capital assets while contributing to a well-defined vision for food system transformation. Considering the complementary nature of these frameworks, this research has sought to join the CCF and NA to determine if together these frameworks can adequately reflect Dene values in addressing interconnected challenges of food systems sustainability, food sovereignty and well-being in northern Indigenous communities. We found that together, these frameworks enabled KTFN to describe the state of their food system and discuss how conditions are being improved across all components of the food system in accordance with the community's values. The outcome of these discussions is encapsulated by the CAVF, which outlines all elements of the community's food system, and offers a framework to generate guidance for achieving food system goals based on KTFN's Dene values.

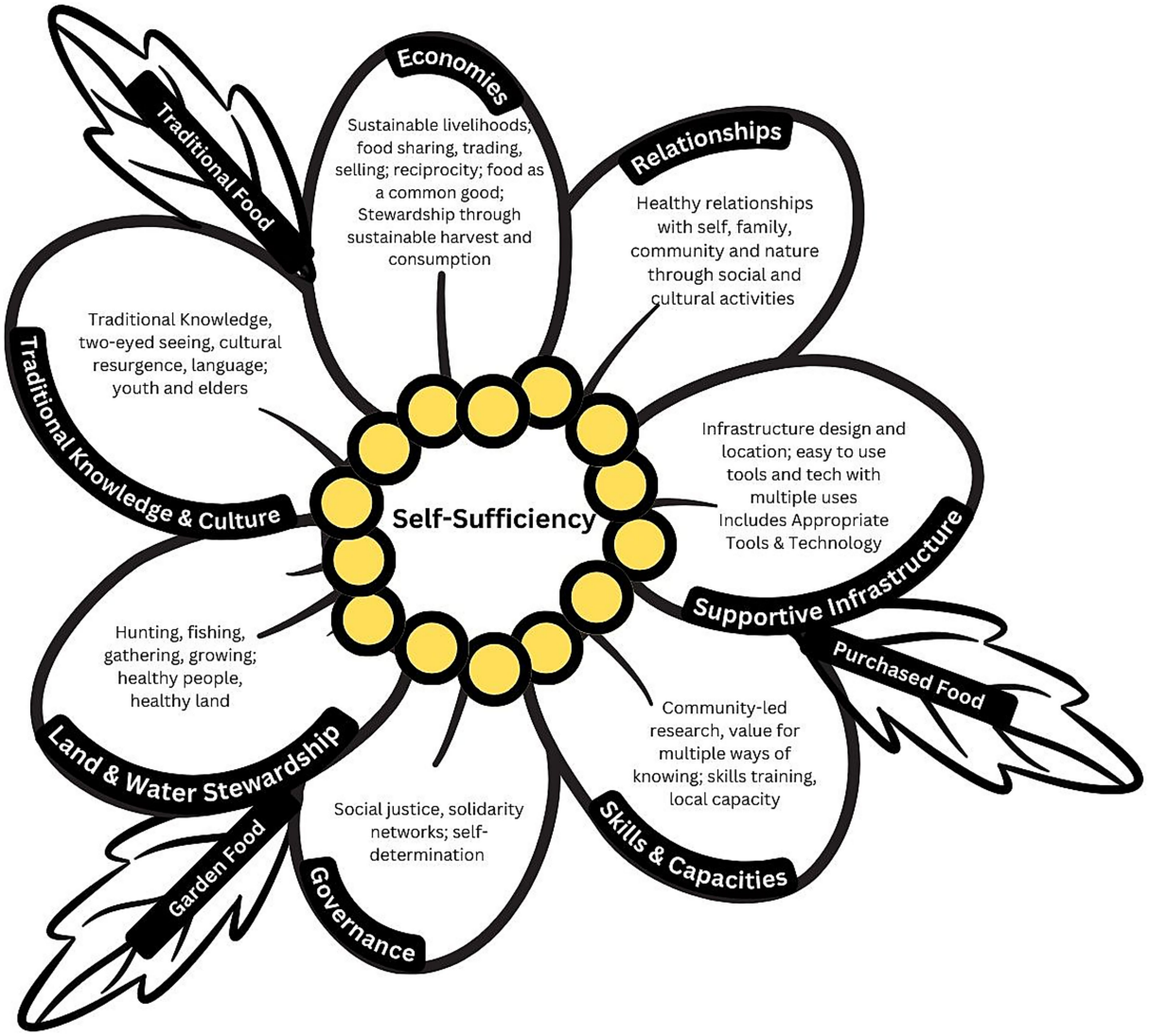

FIGURE 2
CAVF northern food system model.

5.1 Community Agroecological Values Framework (CAVF)

The CAVF is a novel value-based, systems-oriented framework that offers a comprehensive approach to food systems planning. It builds upon the foundational concepts of the CCF while advancing an agroecology approach to growing food in the North. This framework addresses the CCF's linguistic and value-related limitations encountered by KTFN in 2015 (Spring et al., 2018, 2023; KTFN and Temmer, 2024).

Within the CAVF, the northern food system is represented by the mountain avens (*Dryas octopetala*), the official flower of the NWT. The mountain avens symbolizes the North's natural beauty and its ability to thrive in a harsh climate. For many Indigenous communities, food is acquired through traditional means, by growing it individually or collectively, and by purchasing it at stores or other alternative food networks such as a farmers' market, a food hub, or directly from producers (Spring et al., 2018). These food pathways —traditional food, garden food, and purchased food—are found in the flower's leaves.

At the center of the mountain avens are yellow stamens surrounded by seven petals representing the community goal and intersecting dimensions of NA. KTFN's goal is self-sufficiency, which involves stewardship and community well-being across the seven dimensions of the food system. KTFN's definition of self-sufficiency aligns with Indigenous food sovereignty descriptions in the literature, that emphasize the importance of relationships to the Land, maintenance of healthy traditional food systems, and influence over policies that impact Indigenous lands and communities (Grey and Patel, 2015; Kamal et al., 2015b; Daigle, 2019; Kepkiewicz and Dale, 2019). This resonates with other Indigenous views of well-being which aim for balance and harmony across physical, mental, spiritual, social, and cultural dimensions (Tsuji et al., 2023). For example, Quechua and Aymara communities in the Andes region of South America, *Buen Vivir,* or well-being, refers to a balance of the rights of people and nature to have a good life (Rosset et al., 2021). Similarly, Gall et al. (2021) found that conceptions of well-being among Indigenous groups in Canada, USA, and New Zealand were connected to themes of identity, connection, balance, and self-determination.

The CAVF's seven dimensions— skills and capacities, land and water stewardship, traditional knowledge and culture, economies, relationships, governance, and supportive infrastructure— are complex, interdependent social-ecological systems that require balance among components to support food system goals. This aligns with Nelson and Stroink (2020) discourse on the northern social economy as a complex system. The interconnections among self-sufficiency, holistic well-being and land stewardship are concepts that resonate with Indigenous groups elsewhere in Canada and globally as they emphasize self-sufficiency as crucial for stewarding healthy Land and people and fostering the reciprocal relationships between the two (Kamal et al., 2015a; Throsby and Petetskaya, 2016; Spring et al., 2020; Rosset et al., 2021; Tsuji et al., 2023). In the literature, this is often referred to as food sovereignty, defined as the right of people to produce and harvest healthy and culturally appropriate food through sustainable practices, ensuring future generations can participate in their food system (Patel, 2009) and Indigenous food sovereignty which further emphasizes maintaining reciprocal relationships with the Land and kin through harvesting and cultural practices that support Indigenous identity and ways of life (Kepkiewicz and Dale, 2019).

These dimensions guide food system project development, embodying a holistic and relational perspective of community well-being. The CAVF builds on prior research describing food systems (Spring et al., 2018, 2020, 2023) that emphasizes community values and vision while considering food system complexity in Kakisa. Moving from an asset- to a values-based approach, using the CAVF, Dene communities are focusing on the cultural significance of relationships, reciprocity, generosity, collective identity, and care for the Land, that have enabled them to thrive across generations. Significantly, the values that guide traditional practices also inform gardening activities, supporting food system goals.

6 Conclusion

The Ka'a'gee Tu First Nation is reimagining a sustainable, healthy food system through action projects aligned with their vision. This research builds on a decade-long Participatory Action Research relationship involving projects that have shaped a mutual understanding of the Ka'a'gee Tu First Nation's food system. Drawing from the Community Capitals Framework and Northern Agroecology, this research conceptualized the Community Agroecological Values Framework to identify Indigenous values embedded in KTFN's food system that contribute to food system sustainability and community well-being. The Community Capitals Framework assesses community assets, while Northern Agroecology offers strategies to enhance them, ensuring food projects align with the Ka'a'gee Tu First Nation's vision. The Ka'a'gee Tu First Nation used the Community Agroecological Values Framework to develop a five-year Community Food Action Plan, ensuring that Dene values inform food initiatives, supporting land stewardship, self-determination, cultural revitalization, sustainable livelihoods, and food sovereignty aimed to enhance overall community well-being As part of an ongoing collaboration, the community has begun to implement the action plan.

This research contributes to an expanded understanding of northern food system sustainability and guides food action projects that reflect Indigenous values. Developed with Ka'a'gee Tu First Nation, the Community Agroecological Values Framework incorporates Dene perspectives, however these are not universal to all Indigenous groups. In addition, further research is needed to explore how Community Agroecological Values Framework dimensions interact to foster resilience and to develop an evaluation framework to assess progress toward the community's goals. When used in combination with food systems planning activities such as the methods outlined above, the Community Agroecological Values Framework can lay the groundwork for community-led monitoring and evaluation, where value generated is defined and measured by the community. Broader adoption of this framework as part of food systems planning also offers a comparison of the contexts within which community food systems function. Identifying similarities across case studies can help to disseminate innovative solutions and new approaches for communities to reach their food system goals. The CAVF has been introduced to communities across the Dehcho region, and plans are underway to use the framework elsewhere to support communities in developing their own food system plans. Finally, with this approach, Indigenous perspectives on holistic community well-being can be highlighted, challenging colonial notions of community economic development in the North.

Data availability statement

There were no quantitative datasets used in the analysis of this research. All data was qualitative in nature and, under OCAP principles, is under the ownership and control of the Ka'a'gee Tu First Nation. Requests to access the datasets should be directed to the corresponding author.

Ethics statement

The studies involving humans were approved by the Wilfrid Laurier University Research Ethics Board and Aurora Research Institute. The studies were conducted in accordance with the local legislation and institutional requirements. The participants provided their written informed consent to participate in this study.

Author contributions

JT: Project administration, Funding acquisition, Validation, Data curation, Conceptualization, Writing – review & editing, Methodology, Investigation, Writing – original draft, Formal analysis, Visualization. AS: Writing – review & editing, Supervision, Funding acquisition. RS: Validation, Conceptualization, Writing – review & editing. LC: Writing – review & editing, Validation, Conceptualization.

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Conflict of interest

The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

Generative AI statement

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