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Food system resilience: Identifying regional community assets through an asset-based community development (ABCD) approach

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Abstract

New Zealand food systems are experiencing major challenges for food security, health, and environmental sustainability. Exacerbating their ongoing difficulties, on February 14, 2023, Cyclone Gabrielle struck the Hawke's Bay region on New Zealand's North Island, revealing further critical vulnerabilities in regional food systems including food distribution, which increased food insecurity.

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The storm highlighted the need for food system resilience strategies, raising the question: "How can applying the Asset-Based Community Development (ABCD) framework identify regional food-system assets and map their alignment with stakeholder challenges and aspirations for food system resilience?" This study applied the ABCD framework and a stakeholder perspective to generate a regional asset inventory.

This study draws on the same interview dataset as a previously published cognitive-mapping analysis of the Hawke's Bay food system (Kearns-Steed et al., 2025), applying a different analytical framework to address a different research question. Seventeen stakeholders from multiple sectors were interviewed, and 69 unique assets were identified. The most significant challenge was the lack of a local distribution system, with 41% of stakeholders reporting issues in the transportation sector. Eighty-eight percent of stakeholders expressed aspirations focused on enhancing organizational productivity and fostering a resilient food system, with 27% advocating for more community gardens. The analysis identified a wide range of community assets and mapped them against challenges and aspirations articulated by community leaders. It also noted stakeholder willingness to collaborate toward improving the community. These findings suggested ways to develop potential intervention pathways. Future research should implement and evaluate these strategies to validate effectiveness and scalability in similar regional settings.

Keywords
asset-based community development, ABCD, potential interventions, regional assets, regional food distribution system, regional challenges, regional aspirations, food system resilience, New Zealand

Introduction

Natural disasters and climate-related shocks are increasingly exposing the fragility of regional food systems worldwide. Extreme weather events, from floods and cyclones to prolonged drought, disrupt supply chains, destroy infrastructure, and compound existing food insecurity, especially for communities already operating with limited resources and thin distribution networks (Losch & May, 2023; McDaniel et al., 2021). Building food system resilience around such events has therefore become a pressing priority for researchers, policymakers, and communities alike. Central to this challenge is the recognition that resilience cannot be imposed from outside; it must be built from within, drawing on the assets, relationships, and knowledge systems that communities already hold.

Aotearoa New Zealand, has a low level of resilience to the consequences of natural disasters (Wilson et al., 2023). This was evident when on February 14th, 2023 Cyclone Gabrielle devastated the Hawke's Bay region (Napier City Council, 2024). It caused disastrous flooding and led to a period of regional isolation and economic fragility with enduring effects, some of which was due to the area's vulnerable infrastructure (Ministry of Business, Innovation & Employment, 2023). Destroyed bridges and damaged roadways severely reduced access across the region (New Zealand Transport Agency, 2024), resulting in reduced food supplies entering the region and limited distribution of food within the region. Food access for families therefore became challenging. This paradox of inadequate food access for a significant proportion of the population in a food-producing region is partly explained by the export orientation of the regional food system. Hawke's Bay is a net exporter of food, primarily meat and fruit, and the Port of Napier handles billions of dollars of goods trade annually (Ministry of Foreign Affairs & Trade, 2020). Disruptions caused by Cyclone Gabrielle therefore affected two distinct pathways: the ability to import food from national and global markets to stock regional supermarket shelves, and the ability of regional producers to access those same markets for export. In response, community-led initiatives including marae (traditional Māori gathering places)-based food redistribution hubs and collection networks emerged as critical adaptive mechanisms, demonstrating both the vulnerability of the existing system and the latent capacity for community-centered food distribution (Mistry et al., 2026).

Hawke's Bay experiences a higher rate of food insecurity compared to the national average (Ministry of Health, 2023) and this issue was further

exacerbated by the effects of the cyclone. To mitigate future risks it has been suggested that strategies for a more resilient food system need to focus on community collaboration and strengthening local distribution (Keegan et al., 2024; Ministry of Business, Innovation & Employment, 2023). In this paper, a resilient food system is conceptualized as one that encompasses sustainable food practices through community collaboration, adaptive capacity, and a thriving community-centered economy. Food-system resilience literature identifies local networks, community participation, and place-based knowledge as key attributes of systems able to absorb shocks and reorganize following disruptive events such as extreme weather or pandemics (e.g., Losch & May, 2023; McDaniel et al., 2021). These characteristics highlight the importance of approaches that strengthen local agency and social infrastructure rather than relying solely on external interventions (Inwood et al., 2025).

Background

This study applies the Asset Based Community Development (ABCD) framework to the Hawke's Bay regional food system, to identify existing community assets and map their alignment with regional challenges and aspirations for a more resilient food system following Cyclone Gabrielle. ABCD emerged in the early 1990s in the U.S, to empower deprived inner-city communities by identifying and mobilizing locally held assets rather than focusing primarily on deficits (Kretzmann & McKnight, 1996). While frameworks such as the Community Capitals Framework similarly map community strengths, ABCD was selected for this study because of its emphasis on community-led action around mobilizing community assets (Blickem et al., 2018; Chupp et al., 2023) and its ability to work with Indigenous-focused and -partnered places such as Hawke's Bay (Aimers & Walker, 2016). ABCD systematically identifies capacities embedded within people, associations, organizations, place, culture, and relationships, and then connects them to enable community-led action. This strengths-based orientation aligns with resilience principles that emphasise distributed assets, trusted relationships, and local agency as foundations for adaptive capacity (Harrison et al., 2019; McKnight & Russell, 2018). By mobilising local assets and strengthening bonding, bridging, and linking social connections, ABCD provides a practical mechanism through which food-system resilience can be operationalised at the regional level.

Although ABCD originated in deprived inner-city U.S. communities, subsequent research and practice demonstrate successful application across rural and regional contexts, including Indigenous-partnered and place-based initiatives in which relationship-centered practice, co-production, and power-sharing are central (Chupp et al., 2023). In Aotearoa New Zealand, ABCD has developed alongside a hostile policy environment (Aimers & Walker, 2016) but in dialogue with the Māori community-development traditions espoused by Eketone (2013). At the same time, critiques of ABCD caution that strengths-focused approaches may under-recognize structural constraints such as resource inequities, institutional barriers, and broader policy settings if applied without critical attention to power dynamics (Ward, 2023). Acknowledging these critiques, this study combines ABCD with stakeholder-driven analysis of regional challenges with explicit attention to governance and distribution limitations within the food system.

This paper draws on insights from the Nourishing Hawke's Bay (NHB) initiative, which began in 2020 with a focus on food security and children's nutritional health in the Hawke's Bay region (McKelvie-Sebileau et al., 2022). Initially centered on improving access to healthy food for children, particularly in schools with high Māori populations, NHB then expanded its scope to consider wider food systems and actively involve growers, manufacturers, retailers, and communities in addressing both environmental and economic challenges. The establishment of a local distribution system and meaningful community engagement have been consistently identified as the most important elements in building a sustainable regional food system (Kearns-Steed et al., 2025). Post-Cyclone Gabrielle analyses from the region further demonstrate that well-connected local organizations and responses led by marae sites were critical in mobilising food and support following the cyclone (Bush International Consulting, 2024; Mistry et al.,

2026), underscoring the importance of pre-existing social infrastructure. ABCD offers a structured approach to identifying, connecting, and activating local infrastructure to support long-term food system resilience.

Asset inventories leverage the existing strengths of the community, identifying and enhancing its community assets (Lazarus et al., 2014). This paper analyzes the stakeholder assets within the region to propose a simple and practical model that maps regional resources against regional challenges. However, ABCD does not build resilience through categorization alone; systematic mapping of assets creates the conditions for matching local strengths to specific vulnerabilities and aspirations. This enables community-led identification of targeted intervention pathways. The framework harnesses collective power by making clear what is otherwise not obvious—the full inventory of who holds what, where, and in what form (Kretzmann & McKnight, 1996). Once assets are mapped and shared across stakeholders, the framework creates conditions for deliberate collaboration: connecting asset-holders with those who have identified needs or aspirations, enabling coalitions that would not otherwise form. In a regional food system, this means growers, distributors, educators, and community organizations that may be operating in isolation can be purposefully linked around shared challenges. This builds the kind of social infrastructure that underpins long-term food resilience (McKnight & Russell, 2018; Harrison et al., 2019).

Methods

This study employed a qualitative, cross-sectional design, using semi-structured interviews to capture a system-wide snapshot of the assets, challenges, and aspirations of regional stakeholders in the Hawke's Bay regional food system following Cyclone Gabrielle. We used the ABCD (Asset-Based Community Development) model to source food system asset data. In the ABCD framework, an asset is defined as any existing strength (physical, social, cultural, or institutional) that a community holds and can mobilise toward locally defined goals; a challenge is a barrier, gap, or systemic constraint identified by stakeholders as limiting the sustainability, productivity, or resilience of the system; and an aspiration is a stakeholder-identified goal, vision, or desired change that would improve the food system's function, equity, or resilience. (Kretzmann & McKnight, 1996; McKnight & Russell, 2018).

This study draws on the same interview dataset as Kearns-Steed et al. (2025), which applied cognitive mapping to the same 17 stakeholders to answer a different research question. That study used cognitive mapping to scope what would be required to build a resilient food ecosystem supplying local food to local people. This study applies the ABCD framework to the same data to ask how existing community assets can be matched to regional challenges and aspirations. While Kearns-Steed et al. (2025) produced a composite causal map in the earlier study, the present study pursues a categorised asset inventory with intervention pathways matching assets to challenges and aspirations.

The process began with interviews to assess individual, group, and institutional strengths in the community, which were then aligned with those in the community who can benefit from or contribute to them. Individual strengths are personal capabilities, skills, experiences, or relationships that the interviewee themselves contributed to the food system (e.g., expertise, networks, lived experience). Group strengths refer to assets belonging to a collective which they represent or participate in (e.g., community gardens, volunteer groups, networks, associations). Institutional strengths are resources, roles, or capabilities of the formal organization employing the stakeholder (e.g., access to land, tools, distribution capacity, funding pathways, educational programs). We asked stakeholders to distinguish between what they personally contributed and what their organization or group contributed, for the appropriate coding of assets.

The 17 regional stakeholders included food growers, community gardens, not-for-profit organizations, food rescue groups, educators, agricultural associations, harvesters, distributors, council, and retailers. A purposive sampling approach was used to ensure representation across the breadth of the regional food system; that is, stakeholders with direct and informed knowledge of the regional food system from across sectors, functions, organi-

zational types, and geography were deliberately recruited, ensuring that assets, challenges, and aspirations were captured from multiple vantage points within the system. The purposive approach was also deployed in selecting participants who could speak knowledgeably about the system as a whole.

This study was approved by Research Ethics Accreditation Committee of the Eastern Institute of Technology (Reference: EA09210623). All participants were informed of the study's purpose, their right to withdraw at any time without consequence, and the intended use of the data prior to providing written informed consent. All interview recordings and transcripts were de-identified following data collection, and individual names and identities are not disclosed in reporting.

Individual stakeholders were asked to describe their service and then identify challenges in developing sustainability and productivity within the current food system with the question, "What does your service do and what are the key challenges in Hawke's Bay in terms of sustainability and productivity within the current food system?" This allowed them to highlight both internal productivity and external issues affecting the resilience of the wider food system. This dual framing was intentional because asking stakeholders to reflect on both their own organizational capacity and the wider system challenges ensured that the interview generated data at both the asset level and the system level simultaneously. In addition, for the regional food system sustainability and productivity can be mutually reinforcing, with sustainability referring to the long-term viability of food production practices and relationships and productivity referring to the operational effectiveness of the system in meeting community food needs. Their relationship, however, is often contextually dependent and varied across stakeholders depending on their role, values, and resources. Similarly, to understand their aspirations, stakeholders were asked, "If you could transform our food system to better support the health and well-being of our community, what would you change?" Through these questions, we were able to identify and extract the relevant assets, challenges, and aspirations based on a detailed review of the interview recordings.

The interviews were conducted from August to December 2023, approximately 6–10 months after Cyclone Gabrielle (February 2023). The interview questions did not ask directly about the cyclone. Its effects were therefore captured only where stakeholders raised them, and the data describe the food system in the post-cyclone period rather than the cyclone's impacts as such. Interviews were recorded with permission and were conducted in person for 14 of 17 sessions. The other three were online. The average duration was 52 minutes, ranging from 27 minutes to 2 hours, 31 minutes. A semi-structured format was used, allowing stakeholders to respond about assets, challenges, and aspirations in their own terms.

Analysis

Stakeholders during interviews naturally shifted between individual, group, and institutional levels depending on the context of their response to the questions about service activities (assets), key challenges, and transformative change (aspirations). To maintain clarity between these positions, assets were coded according to the level to which each logically belonged, rather than the position of the speaker. This ensured the analysis accurately distinguished between personal assets, collective/community assets, and organizational/institutional assets. Interview analysis followed a structured, qualitative process integrating thematic analysis with the ABCD framework and building on the cognitive mapping developed in an earlier NHB study (Kearns-Steed et al., 2025). First, interview recordings were reviewed to ensure accuracy and acquire deep familiarization with the data. During this stage, thematic analysis coded statements into preliminary themes relating to assets, challenges, and aspirations. This initial coding was open and data-driven, allowing themes to emerge from stakeholder narratives before assignment to the ABCD framework in the second stage. Second, each coded segment was deductively categorized into one of the six ABCD categories of Location, Associations, Organizations, People, Interconnections, and Culture & Stories. Each category represents a distinct type of asset, e.g., place-based physical resources, collective action, formal structures, individual contributions, relational networks, and cultural

knowledge and narratives (McKnight & Russell, 2018; Nurture Development, 2018).

Categorization followed a function-first principle; i.e., where an asset could reasonably fit multiple categories, it was assigned to the one that best reflected its core purpose or mechanism of action as described by the stakeholder. For instance, mātauranga Māori, which intersects with both place-based knowledge and knowledge-exchange functions, was described by stakeholders as a "cultural knowledge system expressed through identity, whakapapa, tikanga, and narrative practice"; therefore, it was assigned to Culture & Stories (Figure 1). The function-first process applied to the categorization of assets was also applied to the challenges and aspirations identified during interviews. They were assigned to the ABCD category that best reflected the nature and the type of community capacity most relevant to addressing the challenge or achieving the aspiration (Figure 2). Applying the same categorization framework to assets, challenges, and aspirations creates the conditions for systematic matching whereby an asset and a challenge that share the same ABCD category have a natural functional alignment, and therefore the asset's core contribution directly corresponds to the nature of the challenge or the mechanism required to achieve that aspiration.

The same function-first principle was applied at the organizational level. For the purpose of system mapping each organization was assigned to the category best reflecting its primary function and dominant contribution to the regional food system. This organizational mapping provides a system-level overview only. The primary analytical contribution lies at the asset level, where each stakeholder's individual assets, challenges, and aspirations were categorised independently of their organizational role, revealing a cross-category distribution

Figure 1. Illustration of the Categorization Process Applied to an Asset

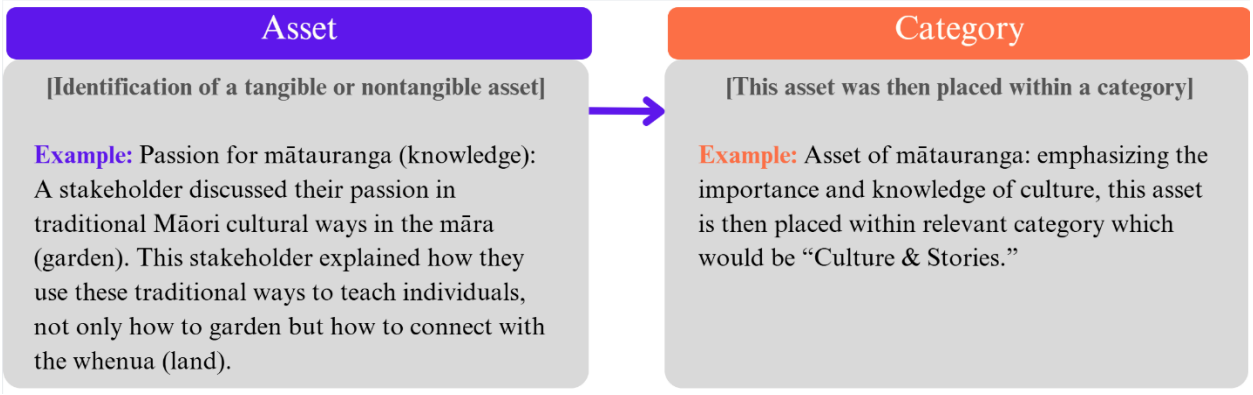
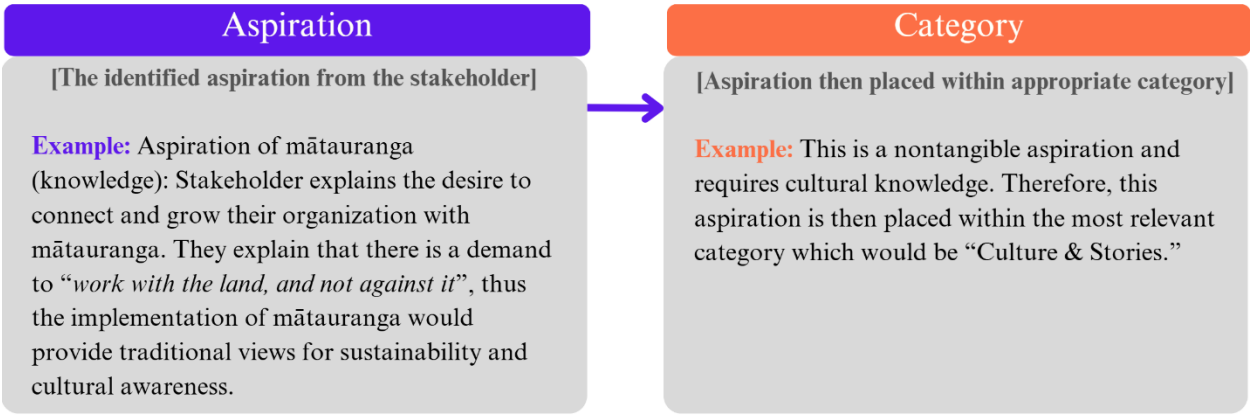


Figure 2. Illustration of the Categorization Process Applied to an Aspiration



of strengths not predetermined by the sampling frame.

Third, the coded segments and their assigned categories were grouped and compared across stakeholders to identify patterns, overlaps, or contradictions. Drawing on this categorised inventory, assets were matched with challenges and aspirations by examining (a) the function of the asset (e.g., land availability, distribution capability, community trust), (b) the type of challenge (e.g., labor shortages, distribution breakdowns, education gaps), and (c) the intended aspiration (e.g., more māra kai (community food gardens), improved transport, enhanced community engagement). The matching process enabled identifying intervention points where specific strengths could directly address system-level issues or support shared future goals. By making explicit what each stakeholder uniquely contributes, whether infrastructural, relational, cultural, or place-based, the categorization ensures that interventions draw on the most relevant assets rather than defaulting to whatever is most visible or most willing. This targeted alignment enhances the potential impact of community-led action.

Results

In total, 17 interviews were completed. The findings are organized according to the three core analytical categories of the ABCD framework: assets, challenges, and aspirations.

Categorizing Organizations

Because any of the organizational stakeholders could fit into multiple categories of the ABCD framework (Location, Associations, Organizations, People, Interconnections, and Culture & Stories), each organization was assigned to the category that best reflected its primary function and dominant contribution to the regional food system, such as land access, distribution capacity, cultural leadership, or community relationships, rather than the sum of all assets it held. This does not imply the absence of assets in other categories; rather, the purpose was to highlight each organization's principal role within the overall asset landscape. Although interviews were conducted with organizational stakeholders rather than members of the general public, many stakeholders held dual roles as residents, community leaders, volunteers, and whānau (family) members. Their perspectives therefore reflected both organizational roles and lived experience. In addition, the public is also represented indirectly through the community-facing services and networks of the participating organizations.

Figure 3 provides a system-level overview of the diverse contributions and collaborative efforts within the Hawke's Bay community organizational roles, highlighting the roles of the various stakeholders, from individual residents to organizations, and outlining how their initiatives and resources contribute to the broader goal of community development. It should be read alongside Figure 4, which shows the full distribution of assets across all ABCD categories.

Assets in the Region

Sixty-nine assets were identified in the stakeholder interviews and each was categorized into one of the six ABCD categories. These categories were further broken down into 14 sub-categories generated inductively from recurring patterns within the data rather than being predetermined, and each asset was assigned to the most relevant subcategory. Figure 4 summarises the distribution of assets across all categories and sub-categories. Location contained 15 assets; Associations 11; Organizations and People eight each; Interconnections 22; Culture & Stories five. The identification of 69 distinct assets reflects the breadth of strengths distributed across the regional food system rather than the total number of assets present in the region. Because the purpose of the asset inventory was to capture diversity rather than volume, the number should be interpreted as a wide-ranging sample of unique assets, each representing a different type of contribution to food system resilience.

The numbers shown in Figure 4 represent the count of unique assets within each ABCD category, not the number of organizations, individuals or cultural groups in the region. For example, the five assets coded under Culture & Stories represent five distinct cultural assets described in the interviews, such as forms of mātauranga Māori, heritage practices, seasonal knowledge, and storytelling

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Figure 3. Distribution of Categorized Organizations According to the Asset-Based Community Development Model

LOCATIONAL ASSETS: UTILISING PLACE-BASED RESOURCES	GROUPS & UNIONS – ASSOCIATIONS	ORGANIZATIONS - LOCAL INSTITUTIONS	PEOPLE: CONTRIBUTIONS OF RESIDENTS	INTERCONNECTIONS - KNOWLEDGE EXCHANGE:	CULTURE & STORIES
Organization 1: Innovates in fruit cultivation, emphasising sustainability and community support through extensive assets.	**Organization 3:** Resources in education with youth, has extensive knowledge in mātauranga Māori (Māori knowledge), and sustainable agriculture knowledge for those in need.	**Organization 10:** Engages and resources large diverse agricultural production. Has innovative mechanical machinery to improve efficiency and mitigate labor shortages.	**Residents of Hawkes Bay** bring a wide range of talents, contributing to community strength. These include natural abilities, learned skills, and a shared passion for empathy and care.	**Organization 5:** Resources of funding opportunities, networks, gardening, and knowledge. Provides educational support for integrating Māori knowledge into growing and cooking as well as promoting community collaboration.	**Organization 2:** A well-established community garden, emphasising inclusivity and education in sustainable practices. Use of mātauranga Māori within the garden and within the educational workshop that they hold.
Organization 7: Local organizations that focus and promote local products. Resources of distribution and consumer and grower networks.	**Organization 4:** Significant knowledge in food rescue models, volunteers, and direct community, and government knowledge and networks.	**Organization 11:** Provides essential services like employment support, food assistance, policy experience, cadetships, and funding allocations.			
Organization 8: Has unique and large mechanical machinery. Networks with local iwi communities for sustainable practices. Has resources to provide education of the organisations sustainable practices to the community.	**Organization 6:** Chair of an agricultural association. Supports agricultural producers through advocacy and education. 130 different organisations are represented under this association.	**Organization 14:** Local organic retailer. Extensive networks within national organic suppliers, distributors, and consumers.			
Organization 12: Large fruit organization with sufficient resources and assets for productivity. Large work labor, and educational opportunities. Has innovative mechanical machinery processes to enhance efficiency without replacing human labor.	**Organization 9:** Extensive networks into the local community, innovative knowledge and resources in food rescue models. Resources for providing the community education for nutritional cooking.	**Organization 16:** Extensive knowledge in nutrition, community networks, government networks and has resources to facilitate education of food.			
Organization 13: Specializes in exports and imports, leveraging economic efficiencies and resources of networks and economy knowledge.	**Organization 15:** Chair of an agricultural association. Supports and retains knowledge and resources for sustainable practices in agriculture. Extensive networks of stakeholders throughout the region. Has research resources and economic factors of the region.	**Organization 17:** Large organic agriculture, poultry, and commercial organisation with diverse business knowledge, resources and global connections. Provides sponsorship resources within the community.			

traditions, not the total number of cultural practices or groups present in Hawke's Bay. These numbers therefore illustrate the distribution of asset types across the regional food system rather than counts of organizations, people or cultural practices. A low number in a category reflects fewer asset types identified in interviews, not an absence of activity or capability in that area of community life. Together, these counts help to identify clusters of strengths. For instance, Interconnections emerged as the largest category with 22 assets, reflecting the richness of relational capital in the region, whereas categories where assets were fewer or less frequently mentioned supports the identification of leverage points and potential gaps for future intervention.

This categorization illustrates the accumulation of resources and connections identified, providing a clear framework for understanding the assets present within the studied region. To maintain organizational anonymity and comply with required ethics approval, individual asset names are not disclosed. Rather, all 69 assets are presented according to their respective categories and subcategories, with anonymized examples provided to illustrate asset types, as shown in Figure 4. For further examples of the available assets, please refer to Appendix A.

Identifying Challenges

After accounting for duplications, 29 distinct challenges were identified. Figure 5 illustrates the diverse nature of the challenges stakeholders face in Hawke's Bay. The challenge most commonly mentioned was "lack of a local distribution system." Forty-one percent of stakeholders (7 of 17) reported experiencing challenges related to lack of accountability within the transportation sector, with several stakeholders noting that they have suffered substantial losses due to perishable goods being mishandled or lost during national and local transit. The losses caused direct financial losses, wasted time, strained business relationships, diminished trust, and reduced productivity in their operations, which ultimately led to a widening gap in trust between growers and consumers. The connection between transportation failures and eroded trust is direct because when perishable goods are mishandled or lost in transit, growers bear the financial loss while consumers receive inferior product or no product at all. Over time, these repeated failures damage the relationship foundation that local food systems depend on; confidence in local supply chains changes to reluctance to engage with them. Stakeholders highlighted the potential benefits of implementing a locally owned transportation system. They suggested that strengthening the connection between local knowledge and consumer-grower relationships could mitigate resource losses currently experienced within the transportation sector. By establishing a localized distribution system, stakeholders believed these issues, in particular the mishandling or loss of perishable goods during transit, could be reduced, which would enhance trust and improve operational efficiency. The second most commonly cited challenge was "lack of local laborers within the community," with 24% of stakeholders citing frustration with difficulty finding seasonal workers, limited pathways for young people into agricultural roles, and absence of any coordinating mechanism to connect available labor with growers needing it.

Figure 4. Summary of Asset Distributions Across the Categories of the Asset-Based Community Development Model

Numbers in the brackets refer to the total assets in each category.



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Figure 5. Regional Food System Challenges Identified by Stakeholders Categorized According to the Asset-Based Community Development Model

This figure should be read alongside Figure 4. Asset categories that align with each challenge indicate where existing community strengths could be mobilized to address that challenge.

LOCATIONAL ASSETS: UTILISING PLACE-BASED RESOURCES	GROUPS & UNIONS – ASSOCIATIONS	ORGANIZATIONS - LOCAL INSTITUTIONS	PEOPLE: CONTRIBUTIONS OF RESIDENTS	INTERCONNECTIONS - KNOWLEDGE EXCHANGE:	CULTURE & STORIES
There is a lack of awareness and motivation for sustainable practices like kaitiakitanga (guardianship of land, sea, and sky). Stakeholders stressed the need to understand seasons and soils for mutual benefit to the land and organisations. Overdevelopment on fertile land was a concern. Stakeholders emphasized collaboration among regional parties to balance economic growth with responsible resource use. The cyclone led to food scarcity, despite food availability in the region. The issue was an inefficient supply system unable to meet demand. Families lacked food, overwhelming non-profit organizations that struggled to meet the heightened demand during natural disasters. Stakeholders repeatedly cited the transportation sector's failures, with delays and losses of perishable goods, posing significant risks, especially for smaller growers. Transportation inefficiencies were discussed as local, national, and international challenges, with no truly sustainable options. For example, Hawke's Bay produces travels unnecessarily long distances for processing, only to return for sale. Smaller growers face high risks and increased costs due to unreliable transportation systems. A government community support entity highlighted the challenge of supporting innovations without evidence of business plan longevity, citing a lack of accessible knowledge for innovators.	Community-based stakeholders highlighted a significant lack of education, leading to poor nutrition and inadequate cooking skills among families. School-associated stakeholders struggle with the costs and time needed to maintain school gardens, despite their value in teaching nutrition. Engaging families in nutritional education is challenging due to stigma; many are embarrassed by their lack of basic knowledge and avoid seeking help. Organic growers, especially smaller ones, face limited market access due to a lack of public awareness about organic benefits and the dominance of large supermarket chains, which drive up costs.	One stakeholder pointed out the challenges of importing cheap meats, noting that restrictive policies strain international relations and limit access to affordable meat for those in need. Stakeholders in agriculture and livestock cite inefficient land use policies as a significant barrier. Water-related policies are seen as inefficient, with stakeholders frustrated by the lack of opportunity to propose more sustainable and innovative approaches. Government grants require proof of longevity, pressuring community-focused businesses who may lack business knowledge for business planning. Nationwide food costs limit the ability to support families in the community. The growing power of supermarket monopolies is increasing reliance on external food sources, draining local economies and making it harder to maintain "local food for local people." Stakeholders' confidence in government support is declining, citing inadequate risk mitigation during regional hardships and the pressure to support communities without government aid. The market sees few new food-growing industries due to a significant lack of capital for innovators.	The lack of cooking education in Hawke's Bay widens the gap between local food supply and demand, as many residents cannot identify or cook with seasonal produce, challenging both growers and consumers. There is a significant shortage of local employees, partly due to limited awareness of high-paying opportunities within industries, hindered by a lack of networking. Employees lack confidence in external infrastructure, fearing that opportunities within industries may be withdrawn at any time. Due to distrust in external infrastructure, a stakeholder organisation hesitates to expand, leading to increased workload without additional resources. The lack of education about seasonal and local food creates preconceived judgments, making it difficult to bridge the trust gap between growers and consumers.	Stakeholder organizations' relying solely on donations faces high risk, as it feeds and educates the food-insecure in Hawke's Bay. If donations fall short, the community risks hunger. Stakeholders report a significant lack of knowledge about where to find resources within the community, reducing productivity for non-profit organisations.	Many organizations lack mātauranga Māori (Māori knowledge), highlighting the need to integrate both Western and Māori knowledge, especially in educational storytelling to enhance community learning. A deeper understanding of the cultural heritage of food, including the seasons and stories behind it, can boost environmental preservation, passion for food, and lead to a more sustainable food system.

A further complexity emerging from the challenges data was the relationship between sustainability and productivity. Stakeholders often discussed these concepts together but did not always experience them as compatible. Some described organic and regenerative practices as supporting long-term soil health and stable yields, an instance where sustainability and productivity are mutually reinforcing. Others described tension between them, where labor shortages, high costs, or commercial pressures for rapid output conflicted with aspirations for more regenerative practices. This variation reflected differences in organizational role, scale, and resource base across the 17 stakeholders.

Figure 5 indicates that the community possesses the assets and resources to address these challenges. However, there is currently a lack of coordination or connection between existing networks, preventing the effective use of local resources to solve local problems. Lack of coordination between networks involves the limited linkage observed across stakeholder groups, sectors, and asset types. First, stakeholders frequently described operating in isolated or siloed sectors, with minimal visibility of what others were doing in distribution, education, growing, or community support. Second, many assets, particularly land, transport resources, and community engagement structures, were held by individual organizations but not shared or integrated into wider system planning. And third, several stakeholders reported duplicating efforts or being unaware of complementary initiatives occurring elsewhere in the region.

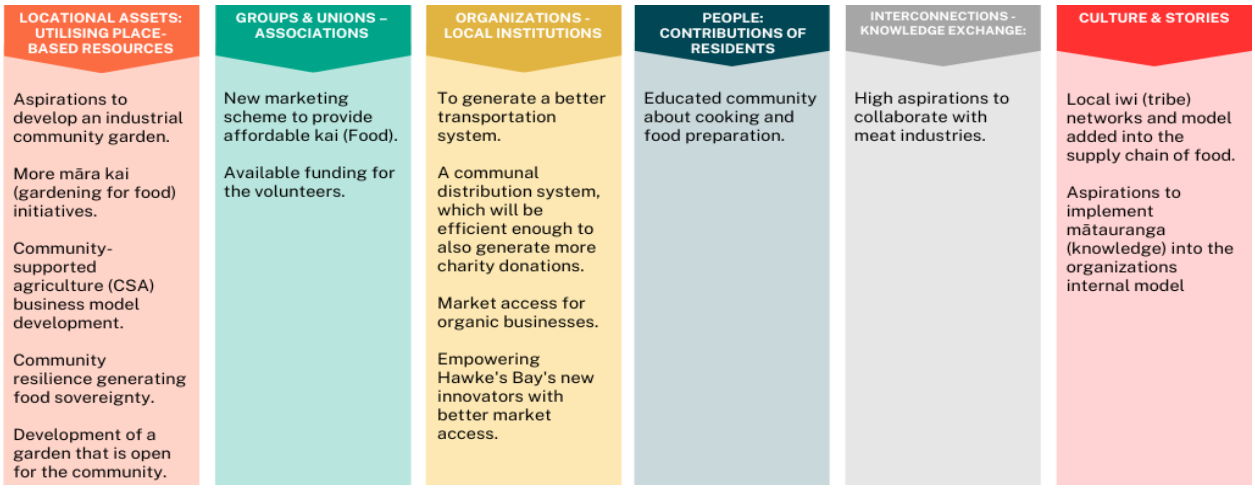
These patterns indicate that although numerous assets exist, they are not yet connected through systematic coordination or shared governance. In ABCD terms, this suggests an underdevelopment of "Interconnections" assets, which serve as the linking mechanisms between people, organizations, and places. It also reflects a degree of uneven asset distribution, whereby some stakeholders hold significant resources (e.g., land, transport, knowledge), while others identified challenges in accessing or engaging with these assets. The implications are significant for regional resilience. Without effective interconnection, local strengths cannot be leveraged collectively, and system vulnerabilities, such as distribution breakdowns and labor shortages, remain exacerbated. Strengthening relational assets and developing bridging mechanisms between organizations therefore becomes an essential pathway for building a coordinated and resilient food system.

Aspirations

Fifteen aspirations were identified. Eighty-eight percent of stakeholders (15 of 17) expressed specific aspirations, primarily focused on two areas: enhancing internal organizational structures to boost productivity and promoting a resilient food system within their communities. These aspirations reflected both shared priorities and highly individualized perspectives. For example, several stakeholders expressed the aspiration to expand māra kai gardens and community-led food growing initiatives to improve access to fresh produce. However, the nature of their aspirations differed significantly. One grower emphasized a desire for region-wide soil-health education and regenerative agriculture training, while a community organization aspired to establish a culturally grounded food-education hub incorporating mātauranga Māori to strengthen whānau (family group) capabilities. Another stakeholder's aspiration focused on creating a coordinated volunteer network to support workforce shortages during peak harvest periods. These distinct yet complementary viewpoints illustrate how stakeholders share broad goals but conceptualize solutions through the lens of their own roles, experiences, and community needs. Figure 6 illustrates how these aspirations align with the characteristics of the ABCD categories.

A significant aspiration finding is the identification of shared goals among stakeholders. Twenty-seven percent of the aspirations (4 of 15) focused on the desire for more local gardens, particularly through māra kai initiatives, to enhance community food sector resilience. Although raised by fewer stakeholders than the distribution challenge, those who identified māra kai as an aspiration consistently described it as a high-impact, system-enabling initiative that simultaneously addresses food access, cultural knowledge, community resilience, and education.

Figure 6. Regional Food System Aspirations Identified by Stakeholders Categorized According to the Asset-Based Community Development Model



Taken together, the assets, challenges, and aspirations identified across the 17 interviews point toward three distinct intervention areas. Transportation challenges were the most cited issue, reported by 41% (7 of 17) of stakeholders, with many specifically referring to the lack of a local distribution system. This issue, combined with the assets held across Location and Interconnections categories, identifies regional food distribution as the first intervention priority and is a strong evidential base. Expanded māra kai and community food gardens made up 27% (4 of 15) of aspirations, was supported by assets in Culture & Stories and Associations, and was described by participants as high-impact and system-enabling, indicating a reasonably well-evidenced intervention. The third potential intervention is food knowledge, education, and skills development, emerging from the convergence of the labor shortage challenge (cited by 24% of stakeholders), the aspiration for soil-health education, regenerative agriculture training, and culturally grounded food-education hubs, and the assets held across the People and Organizations categories. These three intervention areas are developed further in the Discussion.

Discussion

This study aimed to use the ABCD framework and stakeholder perspective to identify regional assets in the Hawke's Bay food system after Cyclone Gabrielle in 2023 and map their alignment with regional challenges and aspirations for the food resilience of the community. The findings revealed a community with substantial but poorly connected strengths. Sixty-nine distinct assets were identified across six categories, with Interconnections (networks, partnerships, communication channels, knowledge-sharing platforms, and collaborative links) emerging as the largest category (22 assets). This reflects a community with strong networks of trust and support. Yet the most reported challenge was lack of a local distribution system, a paradox given that the connections exist, but the coordinating infrastructure to activate them does not. The tension between rich assets and system fragility is where the ABCD framework offers its greatest analytical value, and where the intervention pathways identified in this study are most directly targeted. A further key finding was the commonality in assets identified, and stakeholders' willingness to collaborate toward improvements aligned with the community's aspirations. These are preconditions for the community-led action on which ABCD framework-based change depends. Stakeholders shared broad goals around distribution, food education, and māra kai, while contributing diverse and complementary assets. This combination of shared direction and asset diversity creates the conditions for targeted, community-led interventions of the kind proposed in this study.

Through the alignment of assets, challenges and aspirations described in the Methods, three

candidate areas of intervention were identified. We examined which asset categories held the strongest capacity to address each challenge, and which stakeholder aspirations held the best solution pathway. Regional food distribution, community gardens and māra kai, and food knowledge and education were the potential intervention pathways. Each represented a point where multiple assets could converge to address the significant challenge and the shared aspiration. While the stakeholder interviews in this study did not investigate specific interventions, these were derived analytically from the asset-challenge-aspiration matching and remain untested. This study describes the assets that exist and maps their alignment with stakeholder challenges and aspirations. While it does not demonstrate how food system change is achieved, the systematic identification of who holds what assets, where the key challenges lie, and where functional alignment between assets and challenges exists are necessary preconditions for any future leveraging of change. Translating these intervention pathways into community action requires co-design, implementation, and evaluation that future research should address. What this study contributes is the analytical foundation on which that action can be built.

The first area of intervention centers on regional food distribution. Two in five (41%) of all stakeholders identified the lack of a local distribution system as their most pressing challenge, making this the most strongly evidenced intervention pathway to emerge from the data. A local distribution system based on the community-supported agriculture (CSA) model to build community resilience appears to be the best solution, as assets to support such a system already exist within the region. Land, transportation networks, distribution capacity, and community relationships were all identified in the asset inventory but the coordinating infrastructure to connect them does not yet exist. Once activated, these assets directly address the most frequently cited challenge while responding to the shared stakeholder aspiration for improved food access and stronger grower-consumer relationships. This finding carries added weight in the post-cyclone context. Cyclone Gabrielle cut road access across the region and restricted food movement into and within Hawke's Bay (New Zealand Transport Agency, 2024), and marae-based redistribution hubs filled part of that gap (Mistry et al., 2026). A coordinated local distribution system would therefore address both the everyday transit failures stakeholders described and the region's exposure to future disruption.

The second intervention area centers on community gardens and māra kai. Several stakeholders expressed aspirations for expanded community food growing initiatives, with māra kai representing over a quarter (27%) of all aspirations identified. Community gardens and māra kai serve as the primary pathway through which mātauranga Māori can be practised, transmitted, and sustained within the regional food system. Rather than treating mātauranga Māori as an abstract cultural value, māra kai grounds it in seasonal growing practices, intergenerational knowledge sharing, and community-led food production. This makes the garden itself a site of cultural education, not merely food growing (Glassey et al., 2023). Organic food marketing and education sits naturally within this intervention because community gardens and māra kai are visible, accessible demonstration sites for sustainable and organic growing practices, presenting opportunities for the garden to become both the message and the medium (Glassey et al., 2023; McDaniel et al., 2021).

The third area of intervention centers on food knowledge, education, and capability building. The evidence for the urgent need for it is weaker, but a potential intervention pathway emerges from two converging threads in the data. The labor shortage challenge, cited by a quarter (24%) of stakeholders, points to a gap in agricultural workforce capability and the absence of any coordinating mechanism to connect available labor with growers who need it. Alongside this, stakeholder aspirations consistently identified education and knowledge building as priorities. For instance, a region-wide soil-health education and regenerative agriculture training program, a culturally grounded food-education hub incorporating mātauranga Māori, and a coordinated volunteer network were all mooted to be essential to addressing workforce shortages during peak harvest periods. The knowledge-building function extends beyond gardens to the development of a

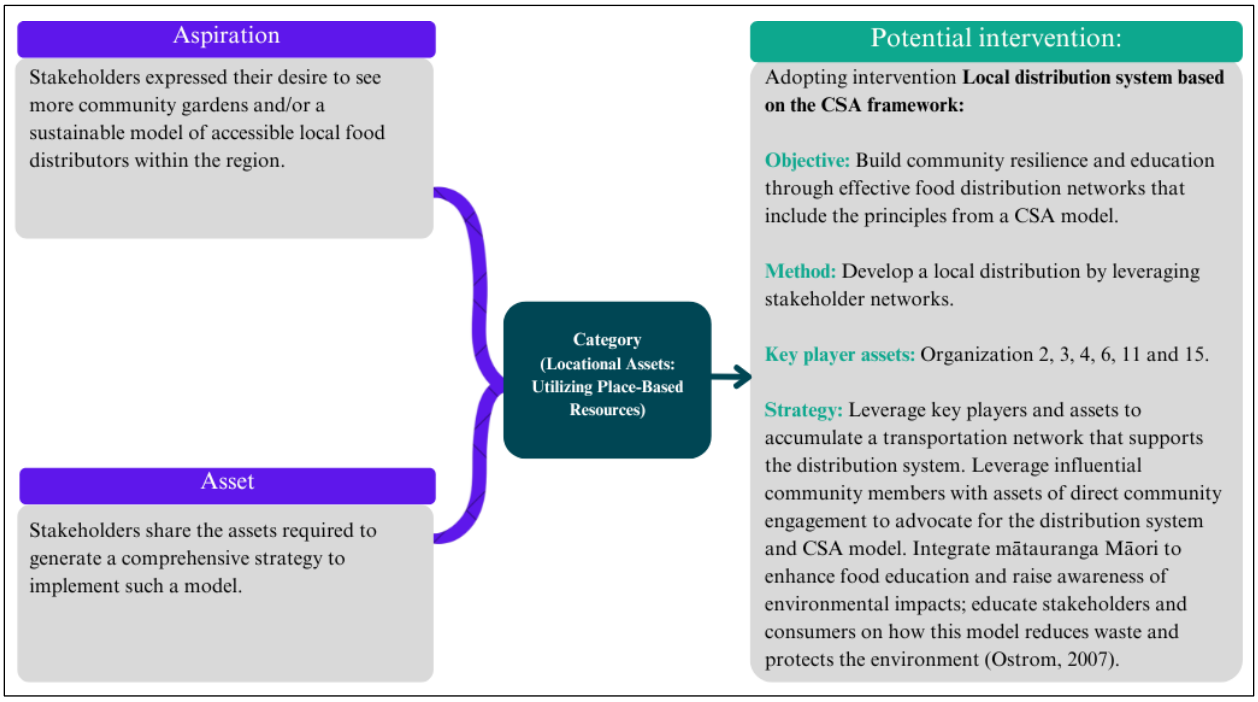
food hub that empowers local producers and consumers, fosters sustainable practices, supports pathways into agriculture to promote local labor interest, includes a communal kitchen initiative to encourage consumption of nutritional food, and supports resource guidance to identify and utilize local assets to mitigate challenges and enhance aspirations. Collectively, these initiatives address the capability gaps that underpin many of the challenges previously identified (e.g., labor shortages, education deficits, and underutilisation of existing local knowledge) and respond directly to stakeholder aspirations for a more connected and self-sustaining regional food system.

The proposed interventions outlined above provide a framework for empowering communities to leverage local resources and assets. As these interventions were derived analytically from asset-challenge-aspiration matching rather than proposed by participants, they require further development in collaboration with stakeholders to ensure their feasibility. Support from local and regional governments in community interventions is useful as they can provide funding, policy support, and access to resources such as land and expertise. However, interventions can still occur in the absence of government activity. For example, appendix B details potential objectives, methods, strategies, and key players who could contribute their skills and assets with the interventions outlined above without the presence of government.

Using the data from this research, an example of a potential intervention is establishing a local food distribution system to improve food distribution efficiency, repurpose surplus food, and build trust between growers and consumers. Local food distribution systems are increasingly recognized as an important feature of transforming local food systems (Cleveland et al., 2014), and they may foster social responsibility, enhance community engagement, and improve operational efficiency. This community-focused approach seeks to create a cooperative link between food producers and consumers, promoting sustainability through local economies and reducing waste. Figure 7 illustrates the process by which a match could be generated, categorized, and subsequently utilized within an intervention.

Figure 7 shows how specific assets identified in the Hawke's Bay food system, including land,

Figure 7. The Asset-Challenge-Aspiration Matching Process Applied to the Regional Food Distribution Intervention



transportation networks, distribution capacity, and community relationships, were matched to the challenge most commonly reported, lack of a local distribution system, and to the shared stakeholder aspiration for improved food access and grower-consumer trust. The resulting intervention pathway, derived directly from the data, reflects the unique configuration of strengths and needs within this region. The CSA framework provides the structural model through which these matched assets and aspirations can be operationalised. This potential intervention leverages the networks and resources of stakeholders to establish a comprehensive local distribution system that addresses the diverse needs of a community and aims to build community resilience. This would necessitate collaboration among various stakeholders, each bringing unique resources and perspectives pivotal to system success. The system can then be broken down further to the assets that each relevant organization could contribute to the intervention. For example, Organization 11 can facilitate access to substantial land resources necessary for large-scale food production and distribution, while Organization 4's experience in food distribution and waste reduction can be leveraged to enhance the efficiency and reach of a local distribution system. Organizations 6 and 15 contribute expertise in agricultural practices and community engagement, ensuring that a distribution system is grounded in practical, sustainable farming methods while also fostering strong community ties. Organization 2 can integrate sustainable agricultural practices with mātauranga Māori by drawing on their sustainable gardening resources and narratives aligned with the values of māra kai initiatives. Organization 3's aspirations focusing on leadership and mātauranga Māori enriches the educational component, fostering a deeper community understanding of sustainable agriculture and cultural heritage. The ABCD approach provides a framework to explore how stakeholders can collaborate effectively to utilize stakeholder and community assets to mitigate local challenges with local assets and enhance shared aspirations.

The intervention example of a local distribution system aligns with the CSA model, in which farmers and consumers collaborate directly to promote sustainable practices and commitment to local food production (Cone & Myhre, 2000; Ostrom, 2007). Research in the Aotearoa New Zealand demonstrates that CSA creates value through active consumer participation in economic, social, and environmental dimensions of food production, a model well suited to the relationship-centered food culture of regions such as Hawke's Bay (Savarese et al., 2020). The research literature confirms that CSA generates positive outcomes across ecological, social, and economic sustainability dimensions, including strengthened local supply chains, reduced food waste, improved food security, and enhanced community resilience (Egli et al., 2023), outcomes aligning directly with the challenges and aspirations identified by Hawke's Bay stakeholders, and with the broader evidence that regional food systems built on short supply chains and direct producer-consumer relationships are better positioned to absorb and recover from disruption (Keegan et al., 2024)

While this study offers valuable insights into leveraging community assets for enhancing resilience in the Hawke's Bay region, its most significant limitation is that the intervention pathways proposed are derived analytically from the asset-challenge-aspiration matching model and have not been tested in practice. Whether these pathways are feasible, acceptable to the community, or effective in building food system resilience remains to be established. A further limitation is that only a small sample of stakeholders was interviewed and therefore the asset inventory may not reflect all relevant community resources. Because the interviews did not ask specifically about the cyclone, the study cannot separate cyclone-related challenges from longer-standing ones. Additionally, community needs and assets are dynamic and may evolve over time, and the static nature of this asset inventory cannot fully capture these changes. Future research should focus on co-designing these intervention pathways with community stakeholders, testing their practical feasibility and cultural acceptability, and evaluating their effectiveness and scalability in comparable regional settings. Establishing a community governance group to maintain a dynamic asset registry and lead adaptation of interventions over time would

support ongoing collaboration and responsiveness to changing needs.

Conclusion

This paper presents a framework for utilizing the asset-based community development (ABCD) approach to identify interventions by leveraging existing local assets, stakeholders, and key drivers of change. By focusing on resources already present in the community, this approach addresses local challenges and meets aspirations from within rather than relying on external solutions. This study contributes to the literature by demonstrating how the ABCD framework can be applied in a post-disaster regional food system, generating a structured asset inventory that connects community strengths to intervention pathways. The approach is transferable to comparable regional settings where community-led resilience building is a priority. It offers a diverse range of stakeholder perspectives, enriching the analysis, although representation from the retail sector remains somewhat limited. As a solutions-oriented study, the focus on actionable insights offers practical value for communities, researchers, and policymakers working toward regional food system resilience.

This study demonstrates that Hawke's Bay communities hold the assets needed to build a more resilient regional food system and demonstrates that the challenge is not scarcity of resources but the absence of coordinating infrastructure to connect them. The ABCD framework offers a practical and culturally grounded pathway to address that gap. As climate-related disruptions intensify and post-disaster recovery demands grow, the ability to identify, map, and mobilise community strengths from within will become increasingly critical. This study offers both a starting model and a structured asset inventory for that work.

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Appendices

Appendix A. Examples of Assets Across the Subcategories

Examples have been simplified to retain organizational anonymity.

Subcategorized asset	Explanation	Example
Expansive available land	This encompasses assets related to owning and protecting land.	One organization has over 1,000 hectares of fruit and vegetables.
Innovative machinery	This includes assets of advanced machinery.	One organization has the use of virtual reality.
Vast transportation networks	This refers to assets related to owning transportation fleets.	One organization owns a fleet of heavy goods vehicles.
Opportunity for local labor contribution	This asset pertains to the characteristics of an organization's labor and cadetship programs.	One organization sponsors and promotes educational programs for local people to obtain careers.
Workshop/education events	This encompasses the assets and knowledge necessary to conduct workshops, events, and networking opportunities.	One organization attends and sponsors events that promote agricultural career growth.
Available opportunities for funding/sponsorship resources	This includes assets such as grants, sponsorships, and funding allocations.	One organization helps others to navigate and find appropriate funding sources.
Business knowledge and relevant resources to enhance efficiency	This category focuses on assets related to knowledge and resources in economic, environmental, and research domains, as well as successful business models.	One organization supplies international organizations with local resources. This organization has a vast knowledge of business in agriculture.
Policy experience	This pertains to knowledge assets related to policies in agriculture change and/or food rescue.	One organization works within policy and community development.
Wellbeing support	This refers to organizations that promote personal wellbeing or are dedicated to community wellbeing.	One organization provides free and confidential psychological support to employees and their families.
Direct community engagement	This refers to assets related to community networks.	One organization works directly with supporting and feeding the community.
Extensive networks	This refers to the relationships and connections between organizations. Some organizations have extensive relationships within a particular sector, whether global, national, or regional.	One organization has over 130 connections associated with their service in agriculture.
Marketing skills	This includes assets related to promotional and marketing resources.	One organization has monthly e-newsletters, website resources, and networking events to optimize the availability of knowledge to members, to educate and promote sustainable agricultural processes and to boost horticulture networks.
Education opportunities	This includes opportunities such as internal organizational training programs.	One organization provides employees direct education to gardening facilities and food education.
Cultural and historical narratives	This includes the use of mātauranga Māori and/or other historical traditions to boost sustainability in agricultural practices.	One organization uses their mātauranga knowledge to educate the community on seasonal gardening.

Appendix B. Potential Interventions Generated from the Stakeholders' Aspirations, Challenges, and Assets Categorized into Pathways for Regional Food Distribution, Community Gardens, and Local Food Knowledge

Regional food distribution systems

Local distribution system based on the community-supported agriculture framework:
Objective: Build community resilience and education through effective food distribution networks that include the principles from the CSA model.
Method: Develop a local distribution system by leveraging stakeholder networks.
Key player assets: Organizations 2, 3, 4, 6, 11, 15.
Strategy: Leverage key players and assets to develop a transportation network that supports the distribution system. Leverage influential community members with assets of direct community engagement to advocate for the distribution system and CSA model. Integrate mātauranga Māori to enhance food education and raise awareness of environmental impacts; educate stakeholders and consumers on how this model reduces waste and protects the environment (Ostrom, 2007).

Community gardens/mara kai:

Implementing mātauranga Māori (Māori knowledge) into the regional food ecosystem:
Objective: Share knowledge and raise awareness to promote gardening and food education from a mātauranga view.
Method: Use storytelling through symposiums and collaborations as well as facilitate school gardening and food education programs.
Key player assets: Organizations 3, 5, 6, 11, 15.
Strategy: Integrate mātauranga Māori of kai (food) and disseminate stories through community and educational networks and resources (Glassey et al., 2023). Community gardens can serve as platforms for sharing Māori stories, traditions, and teachings, helping to educate participants about the significance of plants and gardening practices.

Organic food marketing and education:
Objective: Promote organic food benefits and access.
Method: Educational initiatives and community workshops.
Key player assets: Organizations 4, 11, 17.
Strategy: Influence policies and community engagement through organization 11's resources and relationships. Promote the advantages of organic foods by leveraging community engagement to disseminate information, through practices such as word-of-mouth marketing and encouraging community members to share with one another their experiences and insights about organic products (Mosley, 2021). Promoting organic foods and gardening can encourage greater community interest in participating in organic gardening, which will in turn support establishing more community gardens.

Food knowledge (education, skills development, training pathways):

Food hub development:
Objective: Enhance food education that empowers local producers and consumers, by developing a food hub that fosters sustainable practices.
Method: Develop a community-owned food hub for collecting and delivering surplus food. This can provide training pathways for both local producers and consumers.
Key player assets: Organizations 4, 7, 11.
Strategy: Utilize local land and funding to establish a community-owned food hub that enhances efficiency, reduces environmental impact, improves food traceability, and expands opportunities for local markets and producers (Perdana et al., 2022).

Supported pathways into agriculture:
Objective: Increase local labor interest in agriculture.
Method: Implement supported pathways for training in higher agricultural roles.
Key player assets: Organization 11, local employers such as organizations 6 and 15.

Strategy: Leverage organization 11's systems, contracts, and connections to promote cadetship opportunities by integrating education and workforce participation, aligning the goals of employers and employees to enhance labor market outcomes (Dawkins et al., 2020).

Communal kitchen initiative:
Objective: Mitigate lack of food education and provide free recipes.
Method: Implement a communal kitchen using local resources.
Key player assets: Organizations 4, 9, 16, 17.
Strategy: Utilize organizations' resources and knowledge to establish communal kitchen to improve the social and nutritional health of community families (Iacovou et al., 2013).

Local resource guidance:
Objective: Identify and utilize local assets.
Method: Leverage relationships from organizations 6 and 15 for local knowledge.
Key player assets: Organizations 6, 11, and 15.
Strategy: Leverage the knowledge and the relationships of organizations 6, 11, and 15 to extend local asset connections (Cunningham & Mathie, 2006).