



The Blueskin and Karitane Food System Report

April 2015

By

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Lottery Grants Board



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Acknowledgements

Thanks to Ella Lawton and Anjali Singh from Otago Polytechnic for their valuable contributions, particularly with the GIS mapping and food consumption calculations.

Thanks to Scott Willis for his valuable contribution to sections 2.1: Food Action in Waitati and 2.3: BRCT's Climate Change Planning in Waitati, for his research in Chapter 3: Climate Change, and his insights and knowledge in Chapter 11: The Layered Cake Approach.

A massive thanks to all of the food producers, distributors, community groups and backyard growers who gave up their valuable time to participate in this research study.

Thanks to Lottery Grants Board, specifically the Lottery Community Sector Research Committee for financially supporting the project.



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Executive Summary

What is local, and what constitutes the Blueskin and Karitane foodshed, is primarily what this report is all about. Working from the evidence that a number of food initiatives already exist, from backyard enterprises through to commercial operations, this assessment delves into the nature of the Blueskin and Karitane 'foodshed', a geographical zone designating a diverse food production (and consumption) area.

We begin by calculating the extent of the significant commercial food production which occurs within the Blueskin and Karitane foodshed area, as well as evaluating the amount of land that is necessary to support the food needs of the foodshed's community. We then explore the 'informal food economy' – the thriving backyard production, trading, bartering and community initiatives that are such a strong part of this place. By looking into the processes of food production, the systems of food distribution and the social drivers underpinning these systems we have been able to generate an understanding of how food is valued by individuals and how it contributes to the strength and wellbeing of communities.

In terms of systems, our changing environment provides the context for this report. Climate change is the most significant and most urgent issue of our time and its impacts are already being felt. To assist with future planning, we must understand the risk to our current food system and the potential to build a more resilient local food system for the future. Food is, after all, fundamental to all we do.

To get 'underneath it all', a structured research process has been used, beginning with secondary sources and later moving on to surveys, focus groups, individual interviews and home/farm/business visits. The research process was also generative, as the report set out not only to describe, but also to work with residents to develop and strengthen the food web within the Blueskin and Karitane foodshed.

The development of a local food system requires work to understand growing potential, infrastructural and system requirements. One of the strongest outcomes of this report is the exploration of a range of different food enterprises, developed through an interactive process of community research, engagement, participation and feedback. These pathways to the future offer ways in which residents can participate through the formal economy to strengthen the local food system and reinforce the Blueskin and Karitane foodshed.

This report will help to not only describe the Blueskin and Karitane food system, but to also provide reinforcement and further foundation for the development of a resilient local food system, and a Blueskin and Karitane foodshed exhibiting a diverse range of produce and a complex web of short and transparent supply chains. Appreciation and knowledge of a local food system is intimately linked with building social, environmental and economic resilience, enhancing our 'food culture' and the health and wellbeing of all who participate in it. This report, while dealing with the particular Blueskin and Karitane foodshed, contains generalisable lessons and insights that we hope will assist others to enjoy the pleasures of local food and its social networks.

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Explanation of terms used in this report.

The Difference Between Foodshed and Food System

Foodshed: This project uses the term 'foodshed' to define the geographic area of Blueskin and Karitane, to identify the food that is produced and consumed within this area, and to indicate what potential the Blueskin and Karitane foodshed area has to meet the food needs of its various communities.

Food System: A food system includes all processes and infrastructure involved in feeding a population: growing, harvesting, processing, packaging, transporting, marketing, consuming, and disposal of food and food-related items.

A food system operates within and is influenced by social, political, economic and environmental contexts. The term 'food system' is used frequently in discussions about nutrition, food, health, community economic development and agriculture.

For the purposes of this report the term 'food system' includes activities related to both the formal economy and the informal economy.

The Formal Economy and the Informal Economy

Formal Economy: Formal economy refers to the legal economy that is taxed and monitored by government and is measured through such tools as the Consumer Price Index and GDP. The conventional food system is characterised by the formal economy and it includes such things as commercial farming operations, wholesale food suppliers, processors and retailers like convenience stores and supermarkets.

Informal Economy: Informal economy refers to a diverse set of economic activities that are not monitored, regulated, protected or taxed by government. A typical defining feature of local food systems, the informal economy is not covered by official statistics and conventional national accounting systems and includes, for example, back yard or lifestyle block production, bartering, trading, mutual aid, and small-scale sale of food items.

The Difference Between Baseline Foodshed Assessment and Food System Assessment

Baseline Foodshed Assessment: The baseline foodshed assessment aims to establish an understanding what food is currently being produced and consumed within the formal economy and within the foodshed boundaries.

Food System Assessment: The food system assessment is an evaluation of the components and systems of both the formal and informal economies as related to food, from inputs to production, distribution, processing, consumption and waste management. It also includes non-material aspects of the food system, such as food culture, social cohesion and livelihoods. Waste management has not been considered in this food system assessment.

Other Key Terminologies

Agribase datasets: Data used for determining what is grown within the foodshed. The data is gathered from farmers annually and provides an accurate reflection of farming practices and food production in New Zealand.

Alluvial fan: An alluvial fan is a cone-shaped (fan) deposit of sediment crossed and built up by streams.

ArclInfo: GIS (geographic information systems) mapping software enables the visualisation of data.

AsureQuality Limited: A company that gathers and collates the Agribase dataset, and holds the license for sale of that data.

Engel's law: This is an observation in economics stating that as income levels rise, the proportion of income spent on food falls, even if actual expenditure on food rises. In other words, the income elasticity of demand of food is between 0 and 1. The law was named after the statistician Ernst Engel (1821–1896).

GIS spatial evaluation of land use: Use of the geographic information system to evaluate the Agribase dataset to determine land use.

Ground truthed: A method by which someone checks that the data generated through the Agribase dataset is what is truly represented on the ground in real life.

Peri-urban: Immediately adjoining an urban area; between the suburbs and the countryside

Purposeful sampling of participants: A qualitative research method that is selected based on the knowledge of a population and the purpose of the study. The subjects are selected because of some specific characteristic.

QEII covenants: An open space covenant is a legal agreement between QEII and a landowner to protect a special open space feature in perpetuity. The covenant is registered against the title of the property and binds subsequent owners. QEII offers support and management of covenants, with specialist advice and monitoring. Field officers visit a covenant site at least every two years.

Mass balance: A way of comparing total production to total consumption for those items produced in the foodshed.

Typical-case sampling techniques: A quantitative research method in which subjects are selected who are likely to behave as most of their counterparts would.

Acronyms

BRCT: Blueskin Resilient Communities Trust

CO₂: Carbon dioxide

CSA: Community-supported agriculture

DCC: Dunedin City Council

DEFRA: Department of Environment, Food and Rural Affairs

DoC: Department of Conservation

ETS: Emissions Trading Scheme

FAO: United Nations Food and Agriculture Organisation

GDP: Gross Domestic Product

GIS: Geographic Information System

GHG: Greenhouse gases

Ha: Hectare

HFCs: Hydrofluorocarbons

IPCC: International Panel on Climate Change

LiDAR: Light Detecting and Ranging (in terms of mapping)

LULUCF: Land-use, Land-use change and forestry

MAF: Ministry for Agriculture and Farming, now Ministry for Primary Industries

MfE: Ministry for Environment

MPI: Ministry for Primary Industries

Mt CO₂e: Million tonnes of carbon dioxide equivalent

NIWA: National Institute of Water and Atmospheric Research

ORC: Otago Regional Council

POWA: Progress of Waikouaiti Area - local community newsletter

QEII: Queen Elizabeth II National Trust covenants

WEGgies: Waitati Edible Gardeners group

WOO: Waitati Open Orchards

Chapter 1.

Why Complete a Food System Assessment?

1.1. Introduction

Food systems comprise all aspects of food production and food distribution. A food system assessment looks into the *processes* of food production (*how* we grow food or raise animals; *how* we harvest food or slaughter animals; *how* we process, package and prepare food for purchase) and the *systems* of food distribution (where and *how* the food is sold to consumers and *how* the food is transported). Food systems operate within, and are influenced by, social, political, economic and environmental contexts.

We are now living in a time of heightened extreme risk (IPCC, 2014). Current industrialised agriculture creates high environmental costs, produces large amounts of greenhouse gases and presents food safety risks. Rising world food prices and energy costs place greater burden on the food system. Debate ensues over the use of agricultural lands for food versus fuel. Peters et al (2008) argue that these issues all reinforce the need for communities and regions to carry out food system analyses to better understand the potential for greater food self-sufficiency.

Growing concerns over climate change, availability of fossil fuel supplies and energy efficiency are drivers of change pushing to adapt to increasing resource constraints and mitigate climate impacts. Tools are needed to determine how the vulnerability of the food system is related to where food is produced and consumed (ibid.). Kenny (2001) highlights the urgent need to not only have baseline data for food but also to forecast food production in climate change scenarios. Kenny states that the greatest impact of climate change on agriculture will be experienced as changes in climate variability and greater climate extremes, explaining that farmers and growers are increasingly required to manage risk associated with climate events, and that this will continue into the future with the possibility of increased risk in some regions.

Research by Otago Polytechnic and Victoria University of Wellington has found that of New Zealand's total ecological footprint, food and beverage accounts for 56% of total land requirements (Lawton, 2013). Local food systems can reduce the ecological footprint by up to 66% (ibid.). The benefits of local food systems are increasingly recognised by New Zealand consumers. Millar (2012) has identified significant demand for local food systems in the Otago districts of Dunedin and Wanaka, led primarily by the desire of consumers to contribute to local economies.

'Localising' a community's food system is considered an important principle or strategy for improving sustainability. However, communities cannot act responsibly and effectively for change if they do not understand how the food system works and understand their own power to act. A number of food system assessments have already been completed internationally. Examples include British Columbia (2006),

New York State (Peters et al, 2009), Washington State (Selfa and Qazi, 2005) and San Francisco (Thompson et al, 2008). The British Columbia study (Anon, 2006) was mainly concerned with the ability of farmers to feed the province's growing population. In the San Francisco Foodshed Assessment (Thompson et al, 2008), the authors asked, "Could the City of San Francisco feed itself with local food from farms and ranches within 100 miles of the Golden Gate?" The 100-mile foodshed was utilised in response to the growing acceptance of this measurement. Each of these studies aims to better understand and address deficiencies in existing food systems.

A food system assessment involves looking at system processes, including social drivers. Our goal in the Blueskin and Karitane assessment is to begin to unlock some of these processes to better understand how individuals value food and how it contributes to the strength and wellbeing of communities. The development of a local food system requires work to understand growing potential, infrastructural and system requirements.

1.2. The Blueskin and Karitane Foodshed

Blueskin Bay is located in coastal Otago, about 25 km north of Dunedin. Blueskin is considered to be the rural coastal district that includes the settlements of Waitati, Doctors Point, Evansdale, Warrington and Seacliff. The broader extent of Blueskin is usually taken to include Merton, Long Beach, Purakaunui and Osborne as well. Geographically, Blueskin is defined by a large bay that contains the Blueskin Bay estuary, and is cradled by the northern slopes of Mount Cargill and the Silverpeaks to the west and northwest. Blueskin is located within the political catchment of the Waikouaiti Coast/Chalmers Wards and is within the Dunedin City boundary. To the north of the Kilmog Hill range lies Karitane, a coastal settlement and associated agricultural area. Karitane is bounded by the Kilmog and Waikouaiti Hills to the south and west, and by the Waikouaiti river to the north (see figure 1).

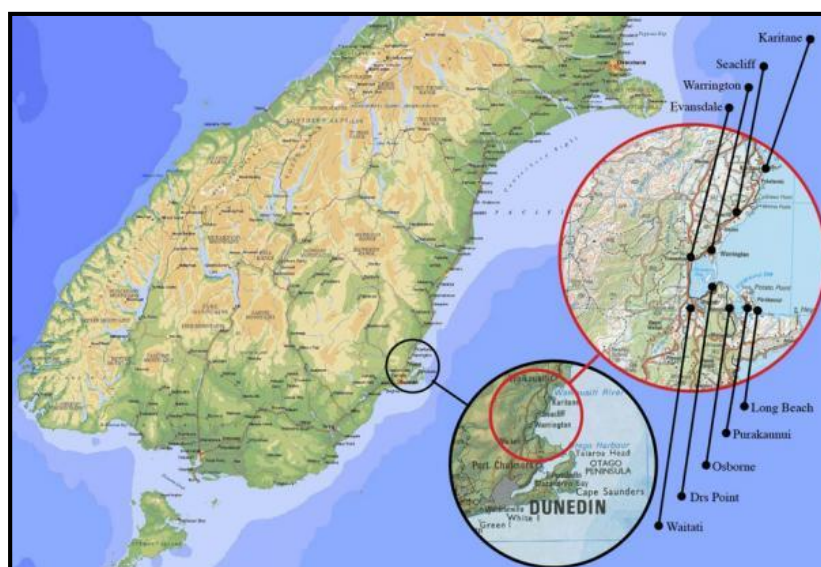


Figure 1: Blueskin and Karitane (source: <http://www.brct.org.nz/about-us/our-settlements/>)

The Blueskin and Karitane foodshed is characterised by peri-urban and rural environments and practices, and very low levels of industry. Based on 2013 census data (Statistics NZ, 2013) there are approximately 2,800 people living within the Blueskin foodshed area. The maps below indicate the foodshed boundary (figure 2) and the settlements that are a part of it.

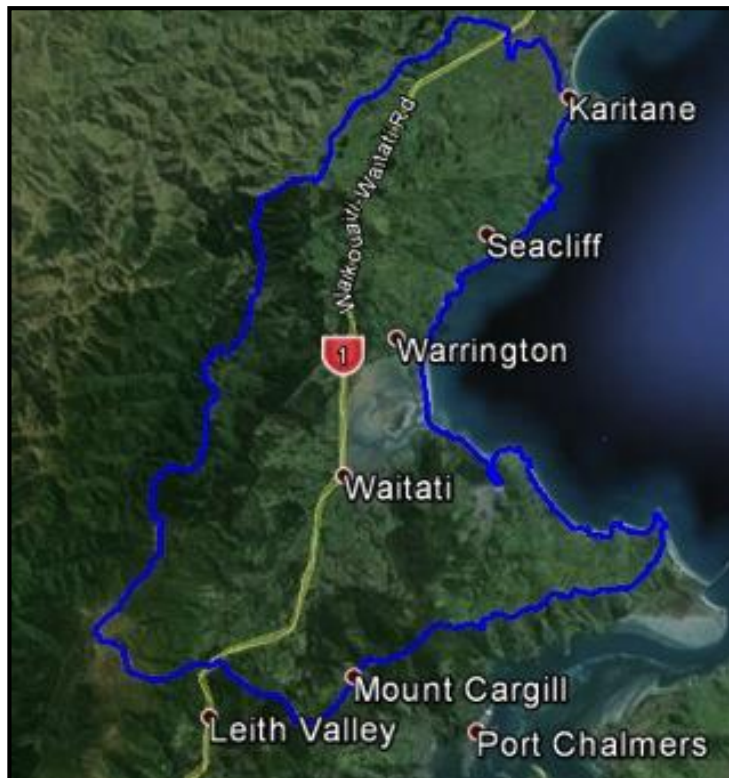


Figure 2: Google Earth image showing the Blueskin boundary

1.3. Overview of the Blueskin and Karitane Food System Assessment Project

This project has sought to complete a food system assessment for Blueskin Bay and Karitane and, in conjunction, evaluate the potential for community-led food enterprises and initiatives within this area. The report discusses and evaluates the food system within the formal and informal economies, recognising the diverse set of economic activities that exist within and between the settlements in the project area. The formal economy as it relates to food, encompasses the commercial food production, consumption and distribution systems that are dominant in society today. It includes commercial farming operations, wholesale food suppliers, processors and retailers such as supermarkets. Food within the informal economy is not covered or is incompletely covered by official statistics and conventional national accounting systems. Food within the informal economy includes, for example, back yard or lifestyle block production, bartering, trading and small-scale sale of food items.

This report is split into several chapters, starting with a broader outlook on food systems and then, as the report progresses, it narrows to a local focus. The report begins with this introductory chapter, which is followed by a setting the scene

chapter, which outlines some of the food-related issues, visions and solutions the Blueskin and Karitane communities have addressed in recent years.

The third chapter focuses on understanding the resilience of the existing commercial food system within the project area through the completion of a high-level assessment of its resilience in the face of climate change. This chapter informs our understanding of the existing food system by focussing attention on mechanisms that could mitigate the effects of climate change on community access to food, and also by exploring how food production contributes to the production of greenhouse gas emissions.

In the fourth chapter a baseline food assessment of the formal food economy is discussed and the extent of commercial food production within the project area is evaluated. An overview of the methodology for completing a baseline foodshed assessment is given at the beginning of the chapter, followed by a discussion of the research findings which estimate the amount of land used, food grown and consumed by the various communities within the foodshed. The result is a strong understanding of the food flows that occur in and out of the project area, and the amount of land that is required to support the various communities within the Blueskin and Karitane foodshed area.

The fifth chapter of the report delves into the informal food system of the Blueskin and Karitane project area, complementing the assessment of the previous chapter's baseline food assessment. Firstly, the methodology for completing quantitative research is detailed. Exploring the level of food production that occurs at a back yard and small property scale, this quantitative research provides interesting insights into how much food is grown within the urban settlements and surrounding rural residential areas, how much home grown food contributes to the average household's food basket, what happens with surplus home grown food and whether residents would like to have access to more local food.

Moving on from the baseline information gathered about the informal economy, in chapter six we learn about the variety of community perceptions and beliefs about the existing food system in greater depth, and where opportunities exist for change. The data captured during interviews, facilitated focus groups, and randomly selected sample interviews is used to understand the community perceptions of the existing food system, as well as its weaknesses and barriers, opportunities and threats. Community aspirations for the local food system were captured, as well as an understanding about what factors may be blocking that progress.

Chapter seven focuses on the multitude of community projects, research, and formal and informal food enterprises that are key influences of the qualitative research. The strong volunteer contributions and community members' involvement in all of the past and present information and activities has been drawn upon and has shaped the qualitative research methodology; outlined in chapter five.

A framework for community action is created in chapter eight, detailing a structure around which the community can achieve commonly stated objectives and aspirations.

Chapter nine builds on the outlined community action framework to propose a series of community initiatives and enterprises. These enterprises, developed after the completion of the community conversations and research, were used as the basis of further community conversations to understand preferred next steps in catalysing local food systems. Community responses to the enterprises are evaluated, with subsequent recommendations for future action discussed in chapter ten.

Chapter eleven discusses the key findings of the report, with subsequent conclusions in chapter twelve.

Chapter 2.

Setting the Scene

2.1. Food Action in Waitati

An alternative, 'grass-roots' publication launched in 1974, 'Mushroom Magazine' was the mouthpiece of alternative Blueskin culture, centralised in Waitati in the 1970's.

"Call it subsistence publishing if you like. We want to cover: Communes and Communities; The Ohu Scheme; Homesteading; Rural Technology; Alternative Schooling; Natural Foods; Organic gardening and farming; Crafts; Survival in Cities; Personal Awareness..." (Blueskin News, 2008).

The alluvial plain at Waitati had provided for fertile market gardens from the late 19th century and most of the 20th century. When the alternative lifestylers began buying old holiday homes in Waitati and Blueskin settlements in the 1970's, they were simply putting down new roots in well-cultivated soil.

By the turn of the century, with new sub-divisions and the desirability of coastal dwellings, the population of Blueskin, and Waitati in particular, could no longer be characterised as 'hippy', even if the perception in popular imagination remained linked to the alternative culture (Harvey, 2008). However, it could be argued that these experimental days provided fertile ideas and inspiration.

By 2006, the market gardens had disappeared, residential property on the flood plain had grown, and in April of that year a significant flood affected wider Dunedin. Not many homes were damaged, but the flood was a reminder of the vulnerability of homes located on a flood plain.

In September of that year, a community visioning exercise was organised in Waitati (Willis, Stephenson & Day, 2012). Green MP Sue Kedgley was invited to give a presentation on 'Food and Energy' and community participants were asked to look 10 and 20 years into the future; answering the questions: *"What would be better?"* And *"What additional challenges would residents face?"* The exercise led to community members planning some short, medium and long-term actions, using the 'Kinsale Energy Descent Plan' (Kinsale, 2005) as a guide. Local food production was one of the main themes to emerge from the workshop. In addition, the first tangible outcomes were a film night (*"How Cuba Survived Peak Oil"*) and the establishment of the Waitati Edible Gardens group (WEGgies) (Willis, Stephenson & Day, 2012). The group began offering edible garden tours (see figure 3) and publishing a column in the local newsletter. By 2007 the group had launched a membership drive and begun a summer harvest market. In 2008 the group began also running workshops and established a community garden. In 2009 new additional initiatives were launched: the Waitati Open Orchards (WOO) group, which focuses on planting fruit trees in public spaces for all, and the Waitati school edible garden, aimed at helping local schools encourage seasonal fresh food consumption and increase gardening skills in the young.



Figure 3: WEGgies Edible Garden Tour and Event in 2007 (source: BRCT)

2.2. Food Action in Karitane

Between 2008 and 2010 two residents of Karitane set out to research and write about what local people were doing in their area in terms of growing food locally. They wrote and published 23 articles in the local community newsletter (POWA) during that period (figure 4).



Figure 4: Sample of 3 of the Local Food articles published in POWA between 2008-2010

Twenty articles featured farms or back gardens stretching along the north coast of Dunedin from Purakaunui to Palmerston and included growers of asparagus, garlic, tomatoes, heritage potatoes, hazelnuts and walnuts, plus other vegetables, fruit and berries. They included fishing families, a beekeeper, a brewer and wine maker, a

cheese maker and a family who processed food into preserves with another making salad dressings. The range was varied including some being organically certified, but with the commonality of having a surplus to sell or trade; some having a regular stall at the Otago Farmers Market.

2.3. BRCT's Climate Change Planning in Waitati

Food emerged as an important topic spanning several themes in the 'Climate Change Adaption Planning in Waitati' report, compiled and published by Blueskin Resilient Communities Trust (BRCT) in May 2014.

Eight community groups/organisations and 17 individuals were contacted and/or met with/interviewed, and community feedback sought via public events and email. The main themes to emerge from the research included: community participation; connected settlement; informed community, and a resilient community. Resilient community was further defined as "*Residents also indicated a need to have the capability and capacity to manage adverse climate change events (specifically including food, energy security, waste and water management and survival preparation)*" (our emphasis, Bould & Willis, 2014).

Food appeared both important, central as it is to human wellbeing, and one of the 'first off the rank' in the eyes of the report authors, in light of the existing depth of community interest in food issues, as noted above. Consequently, and as part of the planning work, a simple action plan was identified which included a section on food and a vision for 2050: "*By 2050 Waitati has made the transition from food dependence to food sovereignty. Residents are active managers of the local food system and hold weekly local farmers' markets, with food from back yard surpluses, community allotments, local producers and community gardens. A food crisis management team manages the Waitati 'food picture', ensuring that there are sufficient calories in stock to feed residents in any crisis situation and ensuring there are distribution networks available. We eat predominantly from within our local food web, have a thriving local economy and broad intergenerational gardening and farming skills. As people have become both formally and informally more linked to our local food web, we develop shorter, thicker, and more resilient food chains, and people have access to a larger range of fresh vegetables and local meat, poultry and fish with a consequent reduction in illness and general increase in health and wellbeing. Residents love holding street parties at any one of the edible streetscape locations scattered around the settlement*" (ibid).

2.4. Growing Interest in 'Local Food'

Conversations about local food have increased locally, as they have nationally and globally. A Karitane resident closely linked to the authors of articles in the POWA newsletters (see above) established a 'local food' website (www.localfood.co.nz), providing an online forum for discussions on local food.

By 2012, a number of people involved in growing, sourcing and provisioning local and organic produce set about organising a 'Food Forum' designed to work towards a local food economy, through such things as: moving away from food as a local

commodity; growing your own food; and securing more local food supply by reliance on small, diverse local farms close to consumers.



Concurrently within Dunedin, there were widespread conversations about local food underway, and on 11th November 2012, the first of three Food Forums was held. The first outcome of the food forum was the development of “Our Food Network Dunedin”, a network based in Dunedin, whose aim is to *“stimulate the production, distribution and consumption of local food and in that way contribute to the building of a resilient and prosperous community”* (DCC, 2013)

By 2014 the Dunedin City Council had recognised the strategic importance of local food and had begun to investigate taking on a more important role in improving the resilience of the city’s food supply. (ODT, 2014¹).

¹ <http://www.odt.co.nz/news/dunedin/287212/council-ponders-food-role>

Chapter 3.

Understanding Food Systems in the Context of Climate Change and Greenhouse Gas Emissions

3.1. Introduction

In this chapter we consider climate change and greenhouse gas emissions and their relationship to food systems. We begin with some background and a discussion about the predicted climate change impacts, concentrating on national and regional predictions and then finally focussing on coastal communities, specifically around Dunedin.

We then explore predicted effects of climate change impacts on food growing in Coastal Otago, including opportunities and threats. We discuss how food production contributes to the release of greenhouse gas emissions and climate change, and explore the food supply chain in the context of greenhouse gas emissions. Through the lens of carbon reduction, local food systems are compared to global systems, with challenges and opportunities explored. Given the dominance of meat production in the existing Blueskin and Karitane food system, its supply chain and corresponding carbon footprint is reviewed. Potential methods of reducing carbon emissions in the existing food system are then explored, taking into consideration global perspectives and ideas, including organic farming. Finally, further opportunities and challenges that are being implemented world-wide for local food systems are reviewed, such as eating 'only local, only seasonal', and the potential for changing farming systems to reduce greenhouse gas emissions.

3.2. Climate Change Background

The year 2014 broke global temperature records: it was the hottest year globally in recorded history². Yet this latest evidence of the long-term human-induced warming of the planet is not startling, simply because the scientific understanding of climate change is thorough (Oreskes, 2007) and has achieved an unprecedented level of scientific consensus (IPCC, 2014). Climate change is already impacting populations around the world and is anticipated to cause much more severe disruption to all human activity. However, climate change threatens not only the long term survival of society; it also calls into question many short-term human activities and ideological positions, such as faith in the desirability of economic growth without recognition of the limits of the natural world (Douglas, 2007; Klein, 2014). Thus, the scientific evidence of human-induced climate change confronts, even today, a range of political interests. The effects of climate change are already occurring on all

² <http://www.giss.nasa.gov/research/news/20150116/>

continents and across all our oceans and seas, yet in many cases, most of the world is ill-prepared for these changes (IPCC, 2014).



Figure 5: Climate Summit gag (source: <http://adaptationresourcekit.squarespace.com/2-learn-about-climate-change>)

In the words of the Prime Minister’s Chief Science Advisor, “*We need to get beyond this pseudo-debate and think in risk management terms at a global, national and local level*” (Chief Science Advisor, 2013, p.1). Sir Peter Gluckman has advised the government to act on the known risks and invest in ways to mitigate the risk, in the same way we protect ourselves against the risk of house fires or earthquakes (ibid.).

3.3. Predicted Climate Change Impacts

3.3.1. National

Table 1 is a summary of projected climate changes for New Zealand. In brief, the resulting impact of changes in wind patterns, precipitation and the chemistry of our oceans is expected to be at least as significant as the changes in temperature itself. According to IPCC the mean air temperature has risen by 0.9°C over the last 100 years (IPCC, 2014). Such changes are not expected to be uniform across New Zealand; there may be pronounced differences between the North and South Island and between the east and west coasts, and there are also likely to be unequal and important effects on seasonal patterns of rainfall and extreme weather events (ibid.).

“For land-based primary industries, climate change has potential consequences in terms of growth rates and quality of yield. With rising temperature and CO₂ some plants for example, grow more quickly provided there are sufficient nutrients and water. There are also, however, other effects such as on pest species, drought conditions or heat stress for animals, changes in crop cycles and timing of seasonal events such as flowering which may partially or fully counteract other effects depending on the conditions” (Gluckman, 2013, pp.13-14).

Table 1: Summary of projected changes (increases are relative to the 1980-2000 average) (Chief Science Advisor, 2014, p.3)

Geographic zone	Ocean acidification	Temperature & extremes	Wind and circulation	Mean Precipitation	Seasonal & extreme precipitation and drought
All New Zealand	pH changes are greater in cooler waters.	The midrange of projections is an average temperature increase of 0.9°C by 2040, 2.1°C by 2090.	Increase in strongest winter winds by 2100.	Little change in the mean for all New Zealand but large geographical variation.	Heavier and more frequent extreme rainfalls, but also more droughts. On average, 2 or more extra weeks of drought annually by mid-century for much of North Island and eastern South Island.
North Island	Upwelling areas such as the Hauraki Gulf are more vulnerable to a given change.	Halving or more of the number of frosts by 2100 in the central plateau (to <15 days per year). 40+ extra hot days (>25°C) a year in Auckland by 2100.	Less westerly wind component and more easterly episodes, as tropical zones move south in summer.	By 2040 overall precipitation decreases in the east by up to 5% (though seasonally variable), with smaller changes in the west.	West - In summer and autumn rainfall decreases, in winter and spring rainfall increases by up to 5%. East (Gisborne/Hawkes Bay)- decrease in rainfall in winter and spring by up to 5 to 10%.
South Island (incl. Southern Ocean)	Impact in high latitude Southern Ocean expected first, from 2040 onwards.	Frosts expected to be rare in coastal locations by 2050.	More frequent and stronger westerlies during winter and spring.	By 2040, increases in the west by 5% and decreases in the east (smaller change).	In winter and spring, more precipitation in the west and south (10% or more increase – responsible for much of the annual change), reduced precipitation in the east (north of Oamaru). Heavier and more frequent extreme rainfalls.

The National Institute of Water and Atmospheric (NIWA) Research’s Dr Tait (lead author of the IPCC’s 2014 Australasia chapter) surmises, “*It is virtually certain that temperatures will continue to rise as a result of anthropogenic climate change. By the end of this century, the mean air temperature for New Zealand could be between 0.7 and 5.1°C higher than present. The large range is mostly due to different projections of greenhouse gas concentrations in our atmosphere. This clearly shows how sensitive New Zealand’s future climate is to current and future global emissions of these gases*” (Tait, 2014). Predictions also indicate that annual rainfall may increase in the west and south of the South Island, and decrease in the northeast (IPCC, 2014).

It is not surprising that predictions vary dramatically. What is obvious is that change is certain and will affect New Zealand in a wide variety of ways.

3.3.2. Regional and Local

NIWA has completed work on ‘Coastal Adaptation to Climate Change’, and planning includes specific risks and hazards for New Zealand’s coastal communities, such as:

- *Sea-level rise*
- *Changes to coastal storms, (storm-surge and wave heights)*

- Increased frequency of coastal inundation from tides, waves and coastal storm surges
- Increased erosion of coastal areas
- Salinisation of near-coast groundwater systems and lowland rivers and creeks
- Combined changes in river flooding and coastal inundation impacting on estuaries and coasts
- Increased challenges for drainage of coastal and estuary margins
- Changes in sedimentation in estuaries and harbours
- Coastal squeeze of ecological habitats between advancing shorelines and human development (NIWA, 2011, p.12).

This research has direct implications for Dunedin coastal settlements. Specific concerns are captured in the predictions for Dunedin, which are summarised in table 2, from the Dunedin City Council (DCC)'s climate change projections policy (DCC, 2011).

Table 2: DCC's climate change projections policy (DCC, 2011)

Climate Variable	Projected change in Dunedin	
	2040	2090
Mean Temperature Change	+1.1 °C	+2.5 °C
Sea Level Rise	+0.3 m	+0.8 to +1.6 m
Annual Rainfall Change [min, max]	-5 to +5 %	-5 to +15 %
Daily Temperature Extremes	Fewer frosts, increasing very hot days	
Extreme Rainfall	+9%	+20%
Drought	Drought incidence will be largely the same over large areas of the city, slight increase for urban area of Dunedin city and expected to increase for coastal areas north of Waitati	
Waves and storm surge	Storm surge level likely to rise at least in line with sea-level and to be greater when combined with ENSO events and increased storm intensity	
Average wind	Increased annual mean westerly component	
Strong wind	Increased possibility of severe winds	
Snow	Snow level rising with decreased annual mean snowfall	

Table 2 shows how mean temperatures will potentially rise by 2.5° by 2090. Coinciding with the temperature rises will be sea-level rise. Coastal communities are potentially at risk from long-term sea-level rise (predicated to increase from between 0.8 to 1.6 metres by 2090) (DCC, 2011). Fitzharris recommended that prudent practice for impact and planning exercises allow for sea level rise of at least one metre by 2100 (2010).

Coastal communities are also at risk from large storm surges, which will rise at least in line with the level of the sea. Professor Fitzharris states, "*The risks of inundation by a 1-in-100 year storm surge will more than double after 2040. Rises in sea level, together with vigorous and regular swells, will lead to ongoing coastal erosion*" (2010,

p.30). He continues, “*There will be changes in coastal geomorphology, especially erosion of fore-dunes, rapid shift in the shape and stability of spits and breaching of lagoons. All these effects will threaten South Dunedin and small communities along the coast (e.g. Warrington, near the mouth of the Waitati River in Blueskin Bay, Karitane)*” (ibid.).

Following on from Fitzharris’ report the DCC is undertaking mitigation and adaption work specifically on coastal natural hazards, and this is being informed by technical work being undertaken by the Otago Regional Council (ORC). The low-lying coastal settlements are vulnerable to the effects of climate change through increasing sea levels, especially when combined with heavy rainfalls and storm surges (ORC, 2014).

Important to note is that some of the particularly low-lying settlements, like Waitati (which is built on the alluvial fan of the water catchments) and Long Beach, are at the frontline of climate change, due to their vulnerability to even minor change in sea-level and climate.

Waitati has been affected by high flows in the Waitati River nearly every decade, for example in May 1957, March 1968, June 1980, February 1991 and April 2006 (ORC 2013a). The ORC approved a consent to extract gravel from the lower reaches of the Waitati River after the April 2006 flood to help improve channel capacity, reduce the flood risk to Waitati township, and to limit bank erosion of the DoC (Department of Conservation) reserve. However, further aggradation or sediment movement will occur, particularly during extreme flood events, due to the geomorphology of the alluvial fan (see figure 6).



Figure 6: Mapped alluvial fan in the Waitati River catchment (ORC 2013b, p.10)

The image in figure 6 shows the mapped alluvial fan in the Waitati River catchment (shaded yellow); a number of hazards can exist on alluvial fans including inundation by flood water and debris. The current location of the main river channels are shown as blue lines (ORC 2013b, p.10).

The largest flood event since European settlement in Waitati is likely to have occurred in the 1920's and highlights how dynamic and unpredictable the river can be. "Eyewitness recall that the worst flood occurred in the 1920's when the meandering Waitati became one sheet of water from one side of the valley to the other" (ORC 1993, p.12). The main channel of the Waitati River changed its course during a large flood in the 1880's, shifting flow from alongside Doctors Point Road to where it is today, running alongside Orokonui Road (ORC 1993).

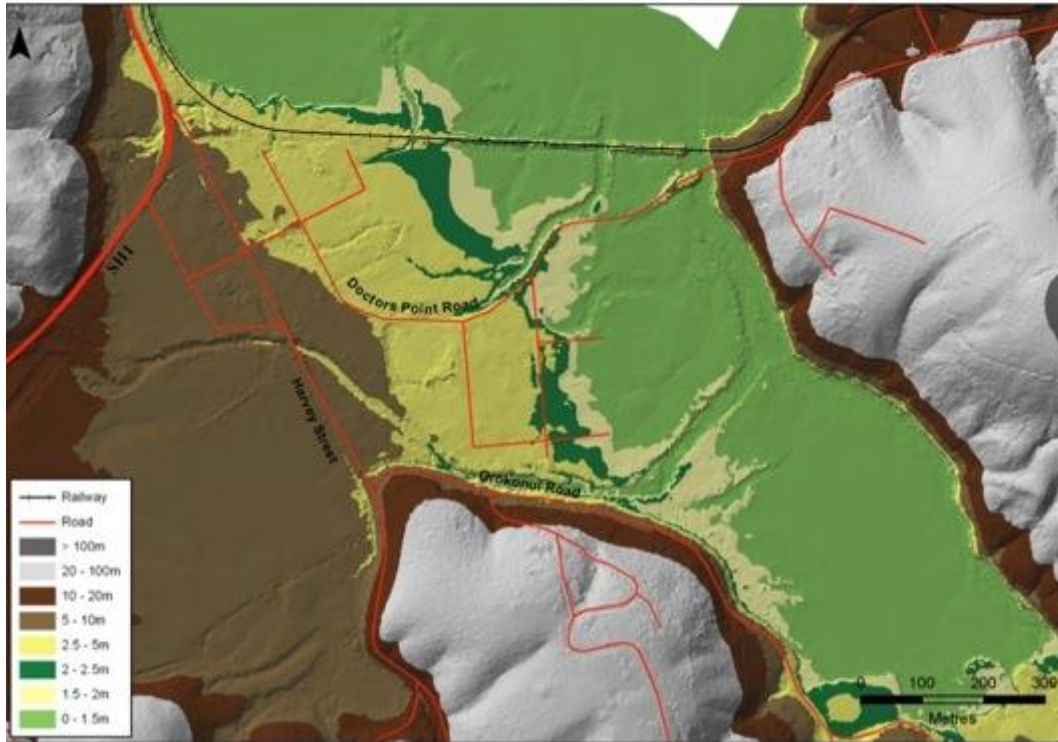


Figure 7: High-precision topographic data of the township of Waitati (source: LiDAR (light detecting and ranging) Map provided by ORC to BRCT in May 2014. Elevations are in metres above mean sea level)

It is important to remember that floods have different effects on the land, especially relating to land-use. Residential property, for example, incurs damage, is costly and takes time to repair. Farmland located on the floodplain, however, while perhaps suffering loss of productivity for a whole season after flooding, may also gain in nutrients from deposit of sedimentation, leading to improved productivity in subsequent seasons.

Figure 7 shows the topography of Waitati, with much of the township located at the mouth of the Waitati River, and much of the community situated on land which is less than 5m above mean sea level. This means Waitati may be exposed to inundation during elevated sea level events (ORC, 2013b). Extreme tides, storm surge and tsunami waves will initially enter the lower-lying parts of the township from Blueskin Bay as backflow up the Waitati River, while larger tsunami events (1 in 50 or 1 in 100 year event) may also overtop the railway embankment that lies to the north (ORC, 2013b). The effect of elevated sea levels may be exacerbated if they coincide with high flow events in the Waitati River. Currently, the ORC does not hold any modelling which considers the combined effects of river flooding and storm surge

(ibid.). Figure 7 also shows the topography of the wide, flat flood plain to the south west of Waitati.

In 2014/2015 the DCC and the ORC are collaborating on Natural Hazard mapping for all of Dunedin and Otago. Maps for Dunedin are currently in draft form and are being consulted on in 2015³.

3.4. Predicted Climate Change Impacts on Food Growing in Coastal Otago

Changes such as increased temperature, longer growing seasons and decreased frost risk, have been argued to be potentially beneficial for some sectors of agriculture, forestry and horticulture. Unfortunately, any benefit may be negated by prolonged drought, increased flood risk or greater frequency and intensity of storms (MfE, 2008; Fitzharris, 2010).

MAF (2010) suggests the key effects of climate change in Otago and Southland on food growing areas are likely to include:

1. *Warmer winters, reduced frequency of frost and a longer growing season. The daily temperature range is already decreasing in Southland faster than anywhere else in New Zealand.*
2. *More frequent hot, dry, summer conditions in coastal North Otago and possibly Central Otago.*
3. *The possibility of a greater frequency of drought comparable to those experienced during the 1997/98 El Niño and the 1998/99 La Niña episodes.*
4. *Increased rainfall in the main divide of the Southern Alps could increase river flows in the Clutha, Waitaki and Waiau rivers.*
5. *The frequency and intensity of high rainfall events could increase.*
6. *Runoff decreases could be experienced in coastal Otago if warmer and drier conditions are realised. Existing water-short areas would anticipate significant problems with water supply for both rural water and community township supplies.*

3.4.1. Opportunities for Food Growing in Coastal Otago

Some of these projected climatic changes may provide opportunities for food growing during the course of this century (Fitzharris, 2010). For example, there may be some possible productivity increases in existing crops and pasture, and the opportunity to grow a greater diversity of crops (MAF, 2010). Other potential advantages could be less frost, increased rainfall, lengthened growing season and increased levels of CO₂ that enhance plant growth (Fitzharris, 2010). Furthermore, pasture productivity could increase in some areas and decrease in others (MAF, 2010).

³ <http://www.dunedin.govt.nz/whats-on/2gp/natural-hazards-phase/natural-hazard-maps>

3.4.2. Threats for Food Growing in Coastal Otago

Alongside the opportunities however, there will be specific threats. For example, losses are likely to arise from the changes in extremes that might occur, from the increase in drought frequency and severity to more flood risks as intense rainfall events are realised over time (MAF, 2010). Problems such as erosion, compaction and nutrient run-off will provide threats for soil management due to the higher intensity rainfalls, which will also affect local and regional infrastructure including land drainage, flood protection, community water schemes, culverts and bridges, erosion control, farm dams, water reticulation and irrigation (ibid.).

In a changing climate, biological systems come under increased stress. Crops and fruit depend on a stable climate and growing seasons (IPCC, 2014). Even in New Zealand with our 'four seasons in one day' climate, plant types have adapted to the environment. This is likely to lead to an increasing rate of crop failure, due to any number of new environmental hazards, i.e. flooding, downpours, drought, high wind or situations where biological hazards can emerge, such as warm damp conditions causing insect and fungus explosions. The end result, both for the home gardener and commercial grower, is a reduction (through time) of return on cropping, with the potential for total crop loss in some zones, in some years (i.e. the Waitati alluvial fan zone)⁴.

3.4.3. Threats to the Broader Food System from Climate Change

The 2011 Christchurch Earthquake disrupted food distribution throughout the South Island, with bread and milk supplies quickly exhausted in many supermarkets. Climate change will have an adverse and initially unpredictable impact on infrastructure and fuel supplies. Our coastlines are changing, and many roads and rail skirt the coast, and such events as landslips or floods can cut main transport terrestrial routes. There is not likely to be any one disaster point, more a gradual degradation of the ability to manage long, ungainly food chains, and certainly for tropical food crops or international commodities subject to their own biological risk in their country of origin, we are likely to see shortages from time to time, or shrinkage in availability. Over time, the long global food chains we currently see as 'normal' will be degraded and become less reliable until eventually they will likely be 'exceptional' and likely focussed on key tropical commodities like coffee, tea, oils, spices, with staples being increasingly supplied from whatever the local market can supply (see von Braun, 2007; Hertsgaard, 2011; Holmgren, 2009; Tansey & Worsley, 1995).

Political intervention on climate change may also disrupt food chains, through the potential of controls or carbon price on transport systems. Carbon intensive food, if such political intervention occurs, will become an expensive, possibly luxury, item. Since many parts of the conventional food system rely on carbon intensive food components, the conventional diet may be harder to maintain, politically.

⁴ For example, see IPCC 2014 Synthesis Report: pages 13-16, dealing with 'Future risks and impacts caused by a changing climate'.

Professor Hugh Campbell talks about the implications of rising food prices, as 'reverse Engels Law' – the impacts on households of price rises related to food⁵. Engel's Law states that the proportion of spending on food decreases as incomes rise. The conventional food system, however, to which the Blueskin and Karitane Food Systems is tied, is also tied to the global energy regime.

The first impact on prices may be felt through the rising cost of energy inputs into food production. The second impact on prices may be caused by crop failure in certain regions, leading to global shortages, such as the 2008 global rice shortage and the 2010 Russian drought, leading to rapidly rising international wheat prices (see Ainsworth, 2008; Wegren, 2011).

Increasingly, as climate change effects become more pronounced, we can expect a greater incidence of regional crop failure in important staple crops. This will lead to higher prices in these staple crops and for all consumers reliant on the conventional food system (see Hertsgaard, 2011, pp.177-217).

3.5. Greenhouse Gas Emissions

3.5.1. New Zealand's GHG Profile

New Zealand's total emissions in 1990 were 59.6 million tonnes of carbon dioxide equivalent (59.6 Mt CO₂e). In 2011 this total had increased by 13.2 Mt CO₂-e (22.1%) to 72.8 Mt CO₂e. The Ministry for Environment (MfE) 2013 snapshot inventory of greenhouse gases (GHG) indicates that *"the four sources that contributed the most to this increase in total emissions were emissions from dairy cattle, road transport, agricultural soils and release of hydrofluorocarbons (HFCs) from industrial and household refrigerant and air-conditioning systems."* Emissions are categorised into six different sectors: energy (e.g., road transport and electricity production); industrial processes (e.g., metals, minerals and chemicals); solvent and other product use; agriculture (e.g., agricultural soils, enteric fermentation and manure management); land use, land-use change and forestry (LULUCF); and waste. The chart in figure 8 shows each sector's contribution to New Zealand emissions; agriculture (34.4 Mt CO₂e) and energy (31 Mt CO₂e) are the leading producers of emissions.

The graph in figure 9 shows the changes in emissions by sector from 1990 to 2011. Peaking in 2005, New Zealand's emissions subsequently decreased from 2006 to 2009, and then increased from 2009 to 2011. Agriculture was New Zealand's largest emitting sector in 2011, occupying a similar proportion of the emissions profile as energy emissions (figure 8). The decrease in agricultural emissions between 2006 and 2008 was caused by a reduction in sheep, non-dairy cattle and deer populations due to widespread drought, as well as a per head reduction in livestock productivity. Since 2008, agricultural emissions have been increasing due to the expansion of the dairy sector (MfE, 2013).

⁵ Personal Communication, 18th November 2014

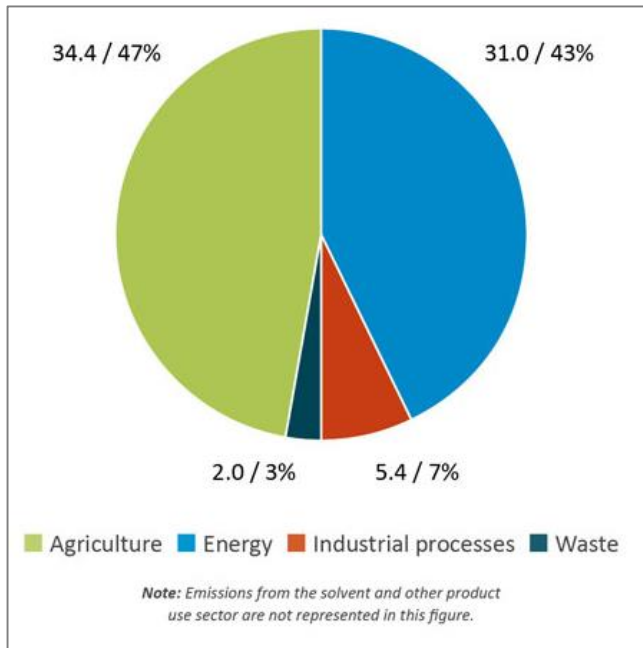


Figure 8: New Zealand's 2011 greenhouse gas emissions (million tonnes) by sector (MfE, 2013)

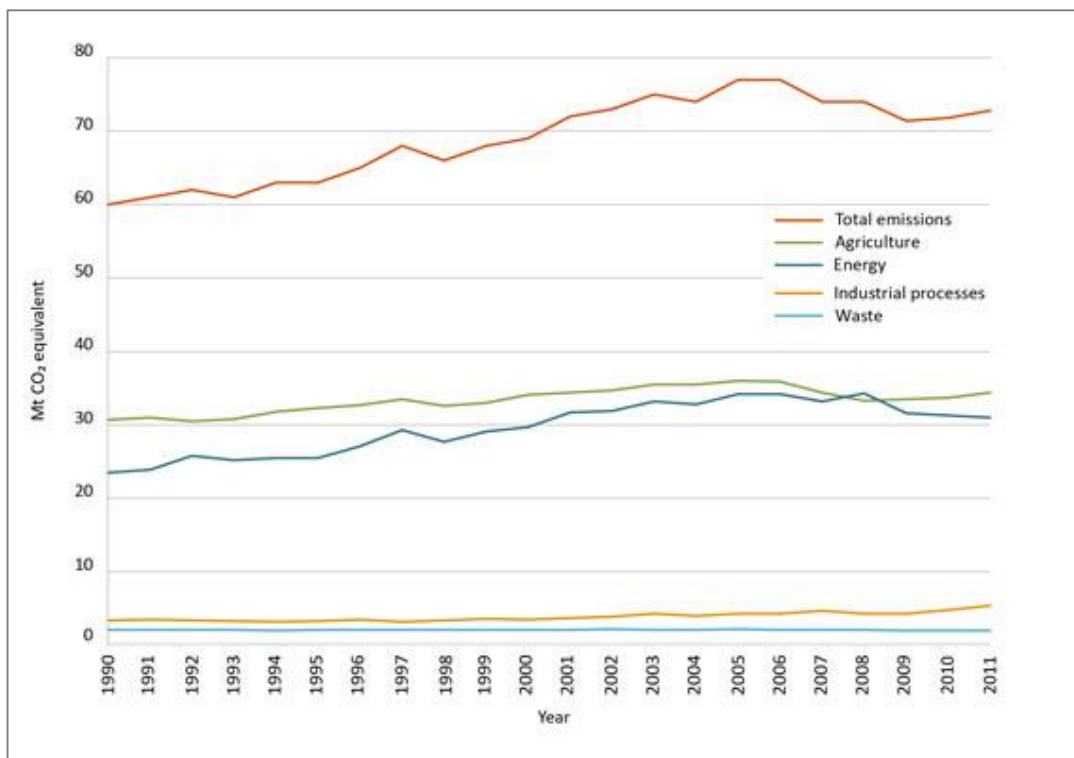


Figure 9: New Zealand's total greenhouse gas emissions from 1990 to 2011 (MfE, 2013)

New Zealand's emissions profile is unusual among developed countries. Typically agricultural sectors within developed countries contribute a small part of their emissions, on average around 12%. Furthermore, CO₂ makes up about 80% of most developed countries' emissions (IPCC, 2007). New Zealand's emission profile is markedly different. The high level of agricultural production saw CO₂ occupy 46% of the emission profile in 2011, with methane and nitrous oxide contributing 52% in 2011 (MfE, 2013).

3.5.2. The Conventional Food System and GHG Emissions

Globally, agriculture is the primary emitter of methane, which is 23 times more powerful than carbon dioxide at warming the atmosphere, and nitrous oxide, which is 296 times more powerful. The IPCC estimates that agriculture is responsible for 13.5% of emissions worldwide (IPCC, 2007). If the connection between deforestation and agriculture is taken into account, farming's contribution to causing climate change rises considerably. In Latin America, for example, about 70% of previously forested land in the Amazon is used as pasture, and feed crops cover a large part of the remainder (FAO, 2006). Deforestation is responsible for just under 18% of emissions around the world (IPCC, 2007).

Direct emissions from agriculture are only one stage in the food supply chain; the emissions from energy in other stages of this supply chain (processing, distribution, packaging, storage, cooking, waste) are also considerable. An Australian study estimated that direct energy use in Australian agriculture only represents between 25-30% of the energy consumed in the whole food supply chain (Wood et al., 2006). Significant sources of emissions in other parts of the food system are often accounted for through other sectors, for example production of synthetic fertilisers and other chemicals are often counted as 'industry' (usually chemical), and emissions from transport or other stationary energy use are accounted for in those sectors (Larsen et al., 2008). Likewise, the full lifecycle of food and beverages in Europe has been found to account for 31.1% of greenhouse emissions (Europa, 2006).

The energy efficiency of the food system has been a significant concern for many years, measured as energy in versus energy out – calories for human consumption. *“As early as 1994, the energy (in) efficiency of the US food production was noted, with each calorie of food consumed requiring ten calories for its production (including packaging and delivery, but not household cooking)”* (Giampietro & Pimentel, 1994 cited in Larsen et al., 2008, p.30). This refers to the US food system in the early 1990s, but is likely to have similarities with the New Zealand food system.

The increase in embodied energy in food is to a large extent related to increased consumption of more processed food. In broad terms, the more food is processed, the higher the resource input and the more total 'food miles' involved as ingredients/components may be taken from whole foods grown in a number of different regions. Similarly, packaging consumes a significant proportion of raw materials such as aluminium, steel and plastics (fossil fuels), releasing greenhouse gases in processing and production (and through transport of the packaging product to food processing) (ibid.). Pesticides and preservers are commonly used in the storage and transport of food and, to protect food in transit, it is often heavily processed, packaged or preserved. Air pollutants and climate change gases are released during these processes and fossil fuels are used for production, transport and packaging (ibid.). Recent studies on household ecological impacts have revealed that food is one of the most significant energy uses and that in most developed countries the food sector accounts for 15-20% of total energy use (Carlsson-Kanyama et al., 2003).

Internationally, there has been significant public and political debate around the contribution of transport within food systems and the extent to which transporting food contributes to climate change. The term “food miles” was commonly used at the beginning of the 21st century to highlight the wider environmental and social issues arising from globalised food supply systems. This saw local food become closely associated with tackling climate change and other environmental problems.

Insight: Life cycle assessments have shown that actual ‘food miles’ (distance from place of production to place of consumption) are not simple shorthand for greenhouse emissions. They highlight that other factors besides transport, such as the use of energy intensive farm inputs or even the energy used in cooking the product at home, very often make a bigger overall difference to climate change. These assessments have been a key tool in assessing the impact of food on climate change. It takes account of the impact at all stages of the supply chain, from agricultural production (and its associated inputs) through to processing, packing, transport, retailing, home storage and preparation, and final disposal.

Morgan et al. (2006) used Life Cycle Assessments to compare the greenhouse gas emissions of two similar plates of food in Seattle. Locally produced food was compared alongside imported products, as well as the production methods of those foods. They found that, for Seattle, locally produced food should be recommended because of the highly productive nature of the region and because of reduced transport requirements. They also concluded that each food should be considered separately as harvest yields and production practices make a big difference. Lastly, they identified that individual car trips to get the food might be the most significant greenhouse contribution for fruit and vegetables.

These studies also highlight important trade-offs – how reducing the impact on climate change in one part of the chain can cause the impact to rise elsewhere in the chain, cancelling out the intended benefit. For instance, refrigeration can reduce emissions from food waste but increase emissions from the use of electricity (Foster et al., 2006). Research also shows what a wide variation there can be from superficially similar systems caused for example by variations in the distance farmers or processors travel to deposit their products, the volume of food transported per trip, transport mode used and the efficiency of storage facilities (van Hauwermeiren et al., 2007). These very wide ranges demonstrate the considerable potential for emissions reductions by adopting new or slightly different practices and show that emissions ‘hotspots’ vary from food to food and even from farm to farm.

The complexity of food systems, and the extent of processing and distribution that form a part of most western food systems, is clearly shown in figure 10. The diagram, outlining the various components and functional relationships that exist within the New Zealand sheep industry, demonstrates the extent of potential greenhouse gas emissions arising from the wider food system.

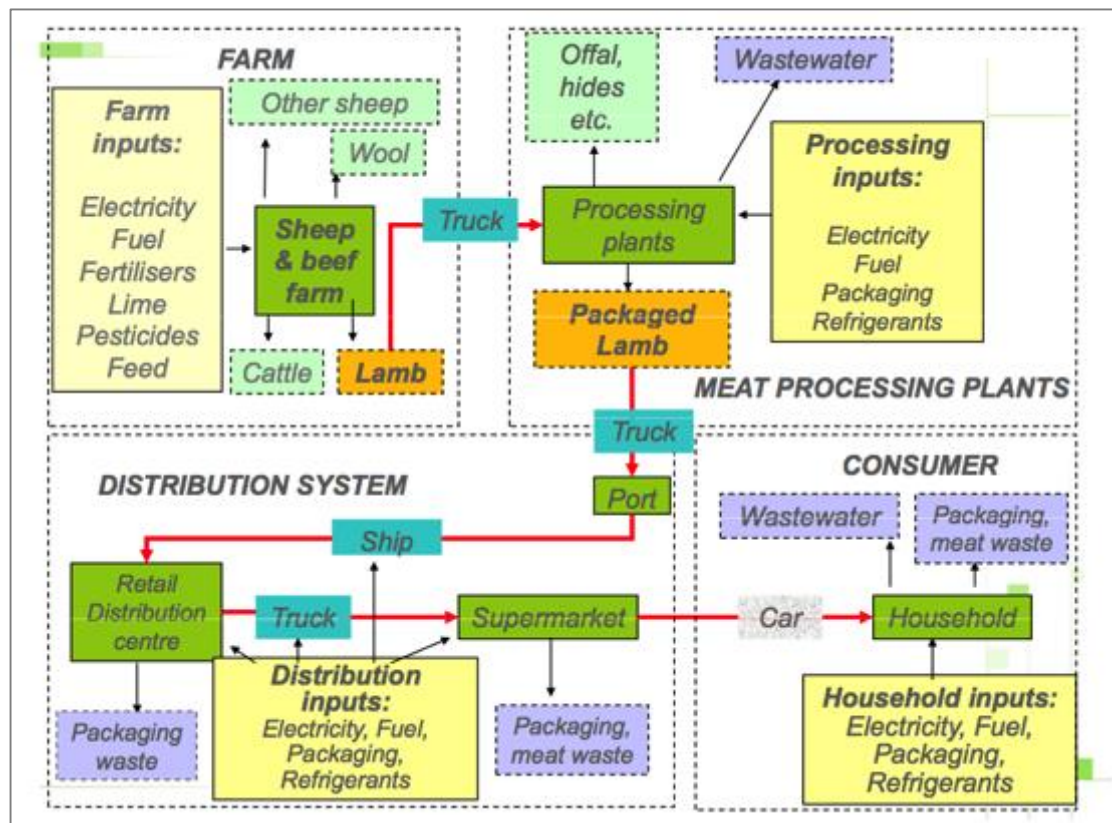


Figure 10: New Zealand Lamb Food System (Ledgard et al., 2010)

3.5.3. Possible Opportunities to Reduce Emissions from Agriculture

There is an enormous amount of literature that discusses methods of reducing emissions from farming. Unfortunately, most of the recommendations either involve significant scientific investigation and subsequent commercialisation to ensure their practical transferability to farmers, or they run contrary to the prevailing model of high-input, commodity export focussed agribusiness and therefore require active change in practices. The current priority of the New Zealand government to achieve economic growth based upon increased agricultural production is in conflict with any objective to reduce greenhouse gas emissions. As a result farmers are currently receiving no directive or incentive from either government or the market to reduce their agricultural emissions.

There are a number of on-farm management decisions that can be made when operational objectives are re-prioritised to include minimisation of greenhouse gases and the mitigation of climate change. Stakeholders suggest a number of large-scale initiatives are required when considering the need to significantly reduce emissions. Larsen et al. (2008) have proposed the following opportunities when considering the Australian agricultural system:

- Carbon sequestration via soil and vegetation;
- Improved animal efficiency that results in greater output of food per animal, thereby reducing the number of animals;

- Changes to animal diets to reduce enteric fermentation, especially in ruminants (cattle, sheep and goats);
- Changed type of animals – move towards less emission-intensive meat sources in human diets – chickens, monogastric mammals and vegetarian fish;
- Improved management of manure and biogas to reduce methane emissions; and
- Improved use of nitrogenous fertilisers to reduce nitrous oxide emissions, through more efficient and targeted application.

Other recommendations for reducing emissions from farming include:

- Using perennials in crop rotations;
- Using cover crops to avoid bare fallows;
- Reducing reliance on external inputs;
- Avoiding surplus nitrogen applications;
- Breeding livestock for lifetime efficiency;
- Compost manure and prevent methane emission escape from manure heaps and tanks (Niggli et al., 2009).

3.5.4. The Role of Organic Farming Systems

The United Nations Food and Agriculture Organisation have estimated that a global conversion to organic agriculture could mitigate 40-65% of agricultural greenhouse gases (Niggli et al., 2009). Such a significant change would result from the lower emissions per unit area of land and also due to the increased ability to conserve soil carbon.

Many recommendations focus on the need to alter fertiliser use and seek substitutes for artificial nitrogen fertilisers. Overall, organic and other low-input forms of agriculture generally result in substantially lower greenhouse gas emissions per unit area of land compared with conventional agriculture. Due to lower average yields for organic production⁶, the reduction in greenhouse gas emissions per unit of product is generally smaller. This is particularly the case for animal products, with organic husbandry encouraging low stocking densities for animal welfare and wider environmental reasons besides climate change. It follows that efforts to cut greenhouse gas emissions through lower external input and more extensive farming practices such as organic should go hand-in-hand with efforts to reduce total consumption of livestock products.

3.5.5. The Impact of Meat and Dairy Production

The impact of New Zealand's meat and dairy production has been discussed above, and is depicted by the unusually high proportion of emissions that are generated by agriculture.

⁶ Argos Research Project results revealed that only the very top organic producers had equal yields to conventional farms and that average yields were 25% lower. What was also notable however was that all were at least as profitable (Hugh Campbell, personal communication 23th January 2015)

Insight: There is significant evidence that suggests a diet with more plant foods and less meat and dairy products will have lower environmental impact. The full impact of livestock production on the environment was considered by the FAO (Steinfeld et al., 2003) with conclusions that showed reducing meat consumption is very likely to reduce an individual's ecological footprint and an overall reduction in meat consumption would significantly reduce environmental impacts and increase capacity of the food system.

A number of Australian studies recommended changing the way meat is consumed and produced, due to its impact on the climate. However, in the Australian context it was considered that red meat farming will always have a strong role to play, due to a) the need for mixed farming systems, and the role that manure is likely to play as an input in the production of foods; b) that some land on which meat is produced is not suitable for other agricultural production; and c) a lack of certainty as to whether existing food systems could support a rapid change to plant-only diets (Larsen et al., 2008). These conclusions are appropriate in the New Zealand context, particularly when considering the large areas of degraded landscape that is lacking the necessary fertility and structure to enable viable land use change.

3.5.6. Case Study – The Carbon Footprint of Lamb

Given the predominance of meat production within the Blueskin and Karitane foodshed area, and its importance to the formal food economy, a case study of the carbon footprint of lamb has been included in this report. This case study is useful in the context of considering localisation of food as a solution to minimising carbon output per kilo of food production.

Ledgard et al. (2010) completed a full life cycle carbon footprint of New Zealand lamb exported to and consumed in the primary export markets. The total carbon footprint was calculated at 1.9 kg CO₂-equivalents for a 100 g portion of lamb meat. This can be broken down into 80% for the on-farm stage, 3% for meat processing, 5% for transportation and 12% for the consumer phase (see figure 11).

The on-farm emissions arise from the “*natural processes associated with sheep utilising pasture as a feed source*” (ibid., p.2). This includes the release of methane from rumen digestion of pasture, via belching, and nitrous oxide from animal excreta on soil. Unfortunately, the on-farm emissions are considered to be the most difficult component to reduce the carbon footprint. Improving on-farm efficiency and the conversion of pasture to meat is the most effective way of reducing carbon greenhouse gas emissions on an overall basis.

Meat processing comprises only 3% of the lamb footprint, but there is potential to reduce this by way of increased refrigeration efficiency, energy efficiency and wastewater management. The oceanic shipping of meat from New Zealand to Europe contributes nearly 5% of the total carbon footprint. The consumer-related components of the footprint are estimated to account for 12% of the total greenhouse gas footprint, increasing to 19% if travel to and from the supermarket is included. 19% is a significant contribution, highlighting the role of consumers in the supply chain.

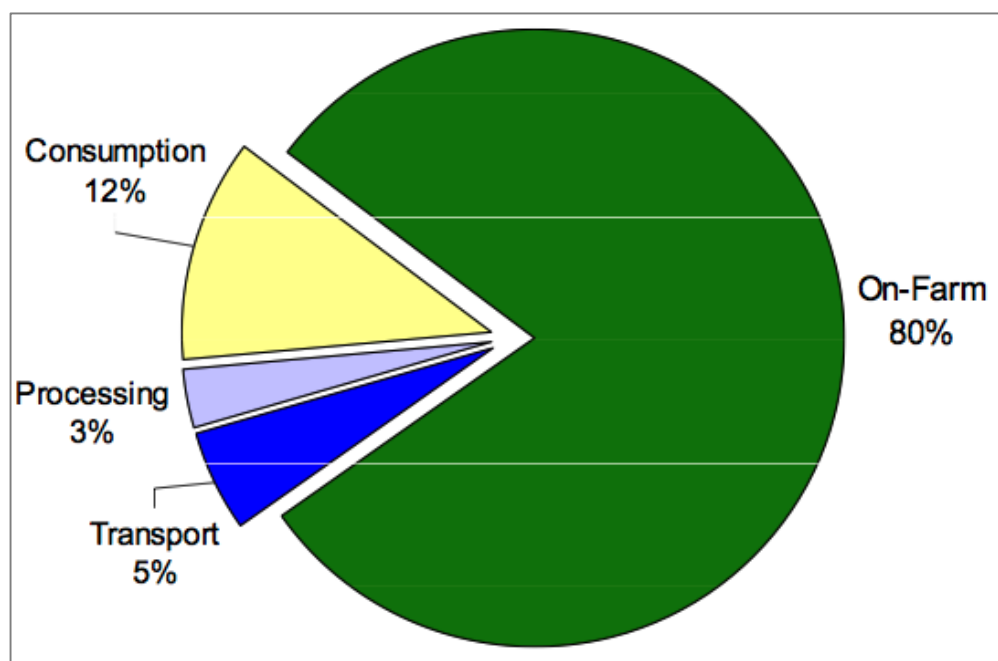


Figure 11: Overall GHG footprint profile of New Zealand lamb (Ledgard et al., 2010)

Saunders et al (2006) completed a full life cycle assessment of key primary products of New Zealand, with a particular focus on understanding how significant the transport emissions are. They found that lamb raised in New Zealand and shipped 11,000 miles by boat to Britain produced fewer greenhouse emissions per tonne than locally produced (British) lamb. This difference was primarily due to different feeding requirements because New Zealand lamb is grazed on pasture, whereas British farmers are more likely to use animal feed. This study also found that dairy, apples and onions produced in New Zealand and shipped to the United Kingdom still had lower total emissions. This finding was reinforced by United Kingdom research (Green, 2003), which suggested that there can be a strong case for importing food for overall carbon reduction, all other things being equal. As demonstrated by this case study, it is important to consider full life cycle environmental impacts when understanding the impact of food localisation on greenhouse gas emissions emitted per kilogram of food produced.

3.6. Opportunities and Challenges of Local Food Systems in the context of GHG Emissions.

3.6.1. Eating Seasonally

Although a case can be made for importing some food goods if carbon footprint is the primary consumption concern, the most effective way of reducing the carbon output associated with food production is to remove out-of-season and out-of-locality goods from a person's diet. If foods are grown locally and in season this is more likely to mean they have not required greenhouses or other climate control methods for production, and may have also undergone less processing, packaging and storage.

Production conditions in some areas may still be more sustainable than others, but seasonality removes one layer of complexity.

Insight: Seasonality may simplify analysis of distribution systems and enable more general statements to be made about the sustainability of local foods. Consumption of foods that are in season locally means their production is likely to be in accordance with the climate. If seasonality is considered (i.e. only foods which are growing locally with 'ease' are included) then a smaller footprint is much more likely.

The Food Ethics Council (2007) found that the three main barriers to local seasonal food consumption were “*consumers’ reluctance to deny themselves out-of-season produce, their lack of knowledge about what is seasonal and local, and poor access to shops selling such foods.*” They concluded that though the message to eat local food in season was appealing to consumers, they need guidance on how to do it. Getting consumers used to seasonal variation is a considerable challenge, especially as consumers often expect most foods to be available throughout the year. Consumer expectation is a significant challenge, directly conflicting with efforts to reduce greenhouse gas-intensive inputs in food production and subsequent processing and transport.

3.6.2. Reducing GHGs through a Shortened Supply Chain

The localisation of food results in a shortened supply chain. This is because food produced close to where it is consumed reduces the energy used and greenhouse gases released through food-related transportation and the associated processing, packaging and storage. However, while international analyses have suggested there can be significant environmental advantages to local food production, this depends on the type of foods and how they are produced, processed, packaged and stored. For example, the lower embedded energy of lamb produced in New Zealand makes it a lower impact choice for United Kingdom consumers than lamb produced locally in the United Kingdom, as discussed earlier (Ledgard et al., 2010). This is, of course, taking a singular focus through the lens of carbon reduction.

3.6.3. Local Distribution Centres

In some instances the greenhouse gas emissions from car-based shopping may exceed the transport emissions from production and distribution (Ledgard et al., 2010) and if purchasing food from a number of outlets results in the extra use of cars, the emissions benefits may be outweighed. Therefore, mid-scale distribution systems that are designed to service small-medium towns should support the production and availability of local food, and in some senses, mimic the qualities of the mainstream food distribution system by providing centrality and convenience. Research from the United Kingdom’s Department of Environment, Food and Rural Affairs (DEFRA) found that “*transport efficiency on a par with national supply chains can be achieved by local operators through effective collaboration with independent third-party logistics providers that are able to operate efficient businesses based solely on local collaboration, where loads are collectively organised and efficient route design is made possible*” (Oglethorpe and Heron, 2009, p.43).

Car shopping can be reduced by walking or taking public transport, or through home delivery. Some studies have shown that home delivery has the potential to lower greenhouse gas emissions if the home delivery is actually displacing shopping trips, and if the home delivery is a single weekly drop-off (Coley, 2009).

The lowest-impact community food enterprises release next to no greenhouse gas emissions from transport and thereby offer the prospect of ultra-low-carbon food if they can match that performance right along the supply chain. Examples that are relevant to Blueskin and Karitane are farm shops or vegetable stalls, where customers travel by foot, or are able to drop in as part of a regular vehicle trip. One enterprise that warrants further exploration is to consolidate deliveries and supplies to a small-scale outlet. An opportunity exists for the various Blueskin communities to support local enterprises to make good on this unique potential, while recognising that a low-carbon future will include a mix of local, regional and global supply chains.

3.6.4. Packaging and Waste

Packaging is a highly visible case of wasteful use of natural resources, which again is a contentious part of the whole food system. Some packaging can help to reduce food waste, such as using containers to protect soft fruit. However, by prioritising the purchase of perishable and fragile produce from local producers, consumers can minimise the extent of food handling and as such the incidence of damage and waste, thereby reducing the need for large amounts of freight packaging. Other simple initiatives include purchasing dry goods in bulk and encouraging customers to bring their own re-usable bags.

3.6.5. Food Culture

Local food systems that enhance and celebrate the availability of locally produced and seasonal fresh foods have considerable potential to help minimise environmental impact, and are more likely to contribute to the development of a strong 'local food culture'. Having a more direct connection with food has been shown to raise consumer awareness of the impacts of food production, and can in turn lead to individual changes about the types of food people eat. Local food enterprises have the potential to play a key role in actively educate their customers about the food they eat (seasonality for example), the links to a sustainable lifestyle, and the ability for individuals and families to minimize their footprint through their food-purchasing decisions.

3.7. Summary of Food Systems in the Context of GHG Emissions and Climate Change.

3.7.1. Predicted Climate Change Impacts

Published reports indicate there is a significant risk to coastal communities in Otago of extreme weather events, ranging from river flooding, droughts and snow fall to rising sea levels and storm surges, particularly when there is a conjuncture of events. The biggest risk is a combined event where extreme weather (rain storms causing

high river flow) is combined with other events, for example extreme high tides made worse by sea level rise or storm surge.

The location and topography of some small coastal communities, such as Waitati in Blueskin Bay, expose them to two broad types of hazards: inundation (either from the sea or river flooding, and deposition of water-borne sediment during heavy rainfall events) and land instability (including the effects of seismic shaking and liquefaction). The interaction of different hazards (e.g. elevated sea levels coinciding with heavy rainfall and high river flows) can also increase the level of hazard faced by these communities.

3.7.2. Predicted Climate Change Impacts on Food Growing

Climate science posits that climate change will result in a greater incidence of extreme events as sea levels continue to rise and weather patterns change. It is hard to offer certainty on impacts on food growing when, because of the very complexity of climate change, effects are hard to predict in detail.

The incidence and extent of extreme weather events and changing climates on a global scale will have a direct impact on the conventional food system which dominates supply in New Zealand and, as such, Blueskin and Karitane foodshed residents. Climate change-induced crop shortages are likely to result in global shortages within an expanding global population, resulting in price spikes and the reduced ability of consumers to access staple foods. Lastly, the extreme weather events are also likely to increase the incidence of disruptions to the existing industrial food supply chain, via damage to transport routes and infrastructure.

3.7.3. GHG Emissions and Food Systems

Agriculture and food production contribute significant amounts of greenhouse gases nationally and globally and are the primary emitters of toxic methane and nitrous oxide gases. Direct emissions from agriculture are one stage in the food supply chain, while other stages such as processing, distribution, packaging, storage, cooking and waste also increase carbon emissions. Internationally, there has been significant public and political debate around the contribution of transport within food systems, and the extent to which transporting food contributes to climate change. Life cycle assessments have shown that actual 'food miles' (distance from place of production to place of consumption) does not equate to increased overall greenhouse emissions. They highlight that other factors besides transport, such as the use of energy intensive farm inputs or even the energy used in cooking the product at home, very often make a bigger overall difference to climate change. These studies also highlight complexities, such as how reducing the extent of greenhouse gas emissions in one part of the chain can cause the impact to rise elsewhere in the chain, cancelling out the intended benefit.

Local food systems have significant potential to reduce greenhouse gas emissions in every part of the supply chain, including transport. The lowest impact community food enterprises have the potential to be ultra-low carbon, as well as providing social and economic benefits. However, there are challenges to ensuring that each part of

the food system is redesigned in a manner that can positively contribute to the social and economic betterment of a community while delivering a low-carbon outcome. No two communities are alike and enabling community members to plan and coordinate together to improve the effectiveness and efficiency of a food system, in the context of their own place, is the most viable means of developing a functional low-carbon local food system.

Chapter 4.

Mapping Food in the Formal Economy within the Blueskin and Karitane Foodshed

4.1. Introduction

The formal economy as it relates to food includes the commercial food production, consumption and distribution systems that are dominant in society today. It includes commercial farming operations, wholesale food suppliers, processors and retailers such as convenience stores and supermarkets.

In this chapter we have evaluated the existing commercial food production that exists within the Blueskin and Karitane foodshed. 'Foodshed' is a concept that refers to the geographic area that feeds a population, and in this instance we focus on the broader area of Blueskin and Karitane, and the potential food production capacity of this area. When discussing local food systems the concept of 'foodshed' is useful in determining what the current food production is in a region (or project area) and what potential the region, or project area in this case, holds to meet local food demand. To this end, this chapter's baseline assessment is an attempt to assess the potential for increasing food security.

Primarily a desktop exercise using secondary data, this assessment provides a snapshot of farm-generated food production, as it existed in 2012⁷. Concurrently, estimates of the foodshed community's consumption of food commodities have been calculated. A mass balance has been calculated to compare the level of food commodities produced within the Blueskin and Karitane foodshed against the level of those same foods consumed, providing an evaluative tool that identifies both surpluses and deficiencies in local food production. Whether self-sufficiency is in fact a goal of these communities has not been fully explored.

This baseline analysis does not trace the food from its origin to its place of consumption. Rather, the calculation of this foodshed's food supply determines the amount of locally produced food that *theoretically* could be consumed locally if the distribution mechanisms and consumer demand allowed this to occur. This baseline work offers the preliminary tools to assess the local farmland resource base (*potential* local food supply) and compare it with food consumption (*inferred* demand).

These findings are placed in the context of the wider evaluation of the Blueskin and Karitane food system, its functioning production and distribution mechanisms, and

⁷ The year 2012 was selected as the baseline data year because the data collected in 2012 is the most complete in the 2010-2014 period.

the community that it involves. The research questions asked in the baseline assessment of the Blueskin and Karitane Foodshed Assessment are as follows:

- How much farmland is there in Otago region and what is it used for?
- How much farmland is there in the Blueskin and Karitane foodshed and what is it used for?
- How much food does the Blueskin and Karitane foodshed community consume and of what food groups?
- Is the Blueskin and Karitane foodshed able to produce sufficient food to meet the needs of the local community?

4.2. Summarised Methodology of the Baseline Foodshed Assessment

A foodshed baseline analysis evaluates the amount of land that is necessary to support the food needs of a foodshed's population. A handful of variables are used to compute this analysis: the amount of food one person requires; the total number of people that need to be fed; and the amount of available land necessary to produce the food.

Typically, foodshed analyses consider three factors (Peters et al., 2008) and are illustrated in figure 12:

- **Factor I:** The size of a foodshed's population.
- **Factor II:** The food calories and / or food weight needed to feed the area's population, expressed as an average diet.
- **Factor III:** the approximate calorific yields and / or food weights from the farmland, based on the quantity of each food product (e.g. barley, beef, potatoes, apples) that can be grown, on average, per hectare of farmland.

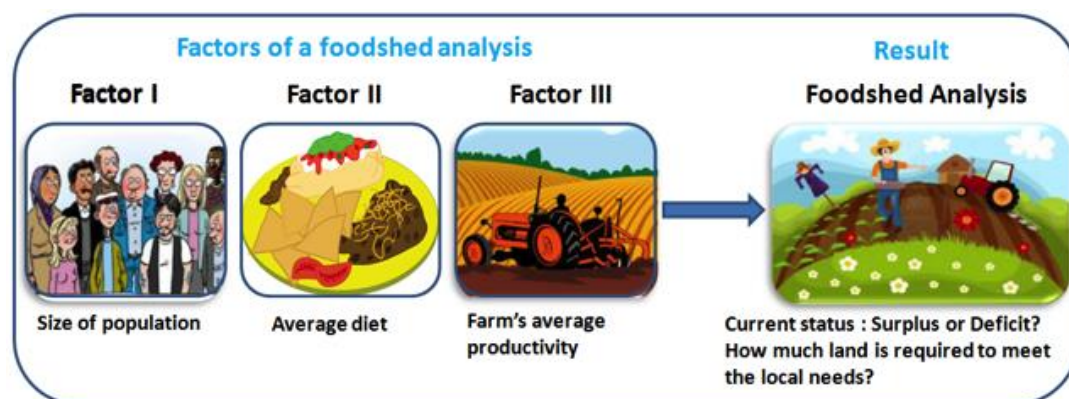


Figure 12: Overview of the foodshed assessment process

The baseline assessment of the existing land use and food production that is occurring across Blueskin and Karitane was completed to provide a comprehensive understanding of what food is being produced in the area, as at 2012. A five-step process was followed to enable completion of this baseline assessment, as outlined below:

1. GIS spatial evaluation of land use across the project area, using best available data sets;
2. Ground-truthing of the data set, ensuring reliability and accuracy, followed by further refinement of the spatial evaluation of the land use occurring across the project area;
3. Calculation of the weight of food commodities produced, according to the land use classifications described;
4. Calculation of the weight of food commodities demanded by the various Blueskin and Karitane communities;
5. Calculation of the mass balance.

These foodshed assessment steps are described in fuller detail in *Appendix A: Full Methodology of the Baseline Foodshed Assessment*.

4.2.1. Analysis of Regional Land Use Evaluation

To provide background context for this food system assessment the farmland of the wider Otago Region has been mapped to identify how much productive land is within the region and to identify the main land-use activities across this region. Figure 13 shows the location of the Blueskin and Karitane foodshed area (in yellow) within the wider regional context of Otago.

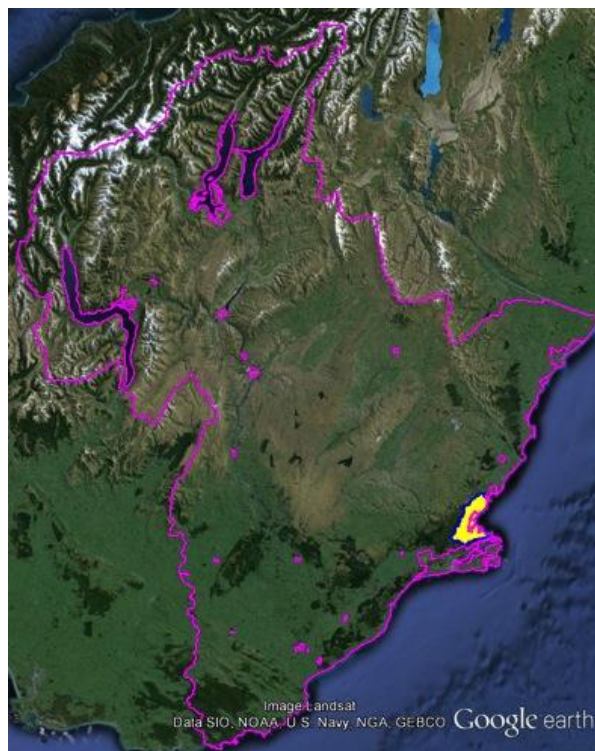


Figure 13: The Blueskin and Karitane foodshed within a regional context

Figure 14 (overleaf) clearly shows the dominance of extensive pastoral farming in Otago. Non-pastoral land, which typically is conservation estate and reserves, also accounts for a significant proportion of the land use across Otago. Dairy farming is clustered with intensity in three main areas of Otago – Clutha, Waitaki and the Taieri Plains in Dunedin.

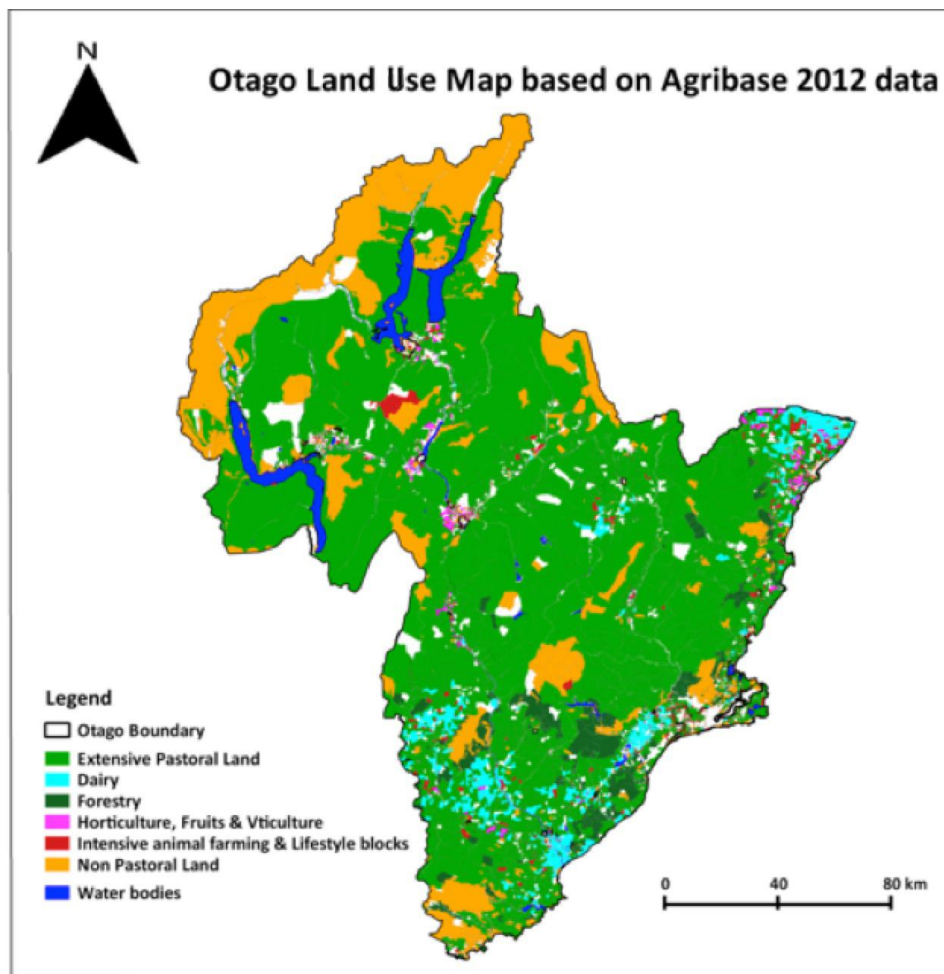


Figure 14: Otago Land Use Map generated using Agribase 2012 data

Table 3 (overleaf) provides a detailed description of each major land use category used in this study. This table shows which farm types have been combined to form a major land use category and how much area is covered under each farm type. The total area of the Otago region that has been reported by Agribase dataset is approximately 2,996,978 hectares. In terms of the total farmland area mapped, almost 73% of the land is extensive pastoral farming. Of this, 61.74% of land is used for mixed sheep and beef farming, 32.04% for sheep farming, 3.74% for beef farming, and the remaining 2.48% for deer and goat farming. Approximately 18.28% (548,518 ha) of land is non-pastoral land which is used primarily for conservation management. Plantation forests makes up 3.65% (109,545 ha) and dairy farming 3.26% (97,758 ha) of the total reported farmland.

Table 3: Otago Land Use details

Year	Agribase 2012 dataset		
Category	Farm type	Farm no.	Net Area
Extensive pastoral land	Beef cattle farm	516	81639.4
	Deer farm	231	53813.4
	Goat farm	22	353.9
	Sheep farm	1382	699671.8
	Sheep & beef farm	1078	1348368.7
Horticulture, fruit crops	Viticulture	62	1644.1
	Fruit farm	149	3692.0
Cropland	Arable cropping	76	9531.5
Vegetable farming	Vegetable farm	24	523.8
Dairy	Dairy	359	87831.5
	Dry Stock	53	9927.3
Forestry	Forest	347	109545.4
Intensive animal farming, boutique land uses, and lifestyle use	Alpaca and/or Llama Breeding	13	227.9
	Beekeeping and hives	7	40.6
	Dogs	2	17.8
	Emu bird farming	0	0.0
	Fish, Marine fish farming, hatcheries	3	29.1
	Flowers	22	171.7
	Grazing other peoples stock	186	23950.2
	Horse farming	78	1334.7
	Lifestyle blocks	2652	10050.9
	Plant Nurseries	24	217.9
	Other livestock	4	28.2
	Other planted types	11	278.9
	Ostrich farming	0	0.0
	Enterprise not covered by others	46	2296.5
	Pig farming	19	833.1
	Poultry	15	570.8
	Tourism	15	532.1
	Unspecified	16	1335.9
	Zoological garden	1	0.1
Non- Pastoral land	Native Bush	49	202569.7
	Not Farmed	51	338957.4
	New Record	91	6991.0
Total land		7604	2996977.5

4.3. Findings and Analysis of the Formal Economy of the Blueskin Foodshed

The methodology described in the previous section has been used to analyse the formal economy within the Blueskin and Karitane foodshed, as described below.

4.3.1. Food Demand within the Blueskin and Karitane foodshed

The first two factors to address when considering the likely food demand within the Blueskin and Karitane foodshed are the size of the population and the average diet.

4.3.1.1. Factor 1: Population size

According to New Zealand Statistics census data and data from the Dunedin City Council, there are approximately 2,800 residents living within the Blueskin and Karitane foodshed (Statistics NZ, 2013).

4.3.1.2. Factor II: Average diet

To calculate the average amount of food consumed by one person, data was used from the Lawton's thesis "*Footprinting New Zealand urban forms and lifestyles*" (2012). The breakdown of three different diets is shown in table 4 below. It shows that there is a slight variation of percentage of food commodities consumed in each diet.

The average omnivore diet was used as a representative diet when calculating food consumption. As such, it is assumed that every person within the community consumes the same amount of food, being 826 kg/person/year.

With 2,800 people resident in the foodshed it is estimated that 2,312,973 kilograms, or 2,313 tonnes, of food are consumed every year. This number represents the amount that needs to be produced in order to feed the population given current food handling, storage, processing and home preparation practices.

Table 4: Blueskin and Karitane consumption estimates by food group, in tonnes, summarises the food weights per person, as well as displaying the food weights multiplied by the population of the foodshed's community. In figure 15 the graphical representation of food demand is shown.

Table 4: Blueskin and Karitane consumption estimates by food group, in tonnes

Commodity	Consumption estimate per person kg/person	Foodshed's community consumption (tonnes)
Four-legged meat	66.0	184.8
Beverages	92.6	259.2
Fruit	109.3	305.6
Veggies	199.4	558.3
Grains	90.9	254.5
Dairy products	117.2	328.2
Other Foods	80.8	226.3
Poultry meat	34.4	96.3
Eggs	9.3	26.0
Fish	26.2	73.3
Total	826.1	2,313.0

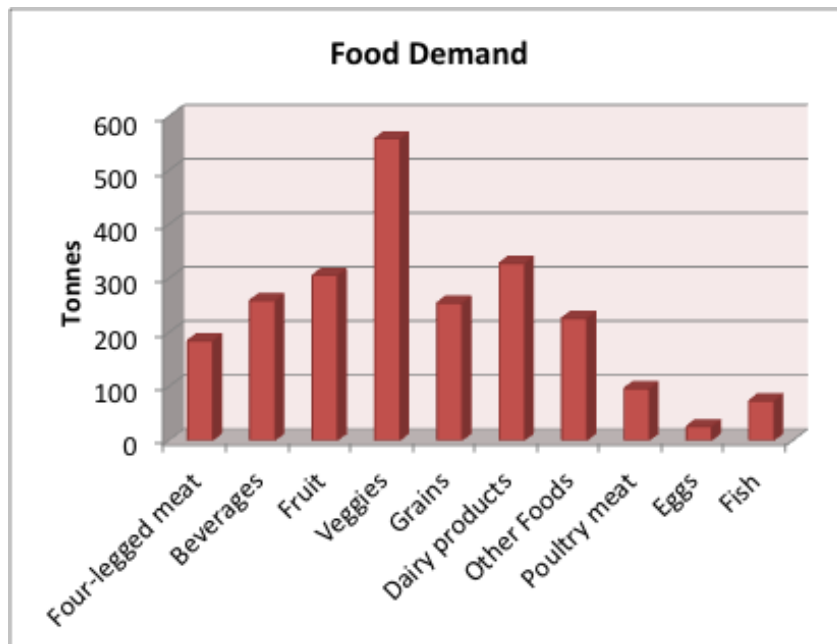


Figure 15: Blueskin and Karitane community's food demand

4.3.1.3. Factor III: Average productivity of land

The goal of the production component of this study is to determine the types and amount of agriculture occurring within this foodshed.

To calculate the average productivity of land we have evaluated its current use. This has included three main steps:

1. Identify the number of farms and hectares in farms in total;
2. Determine individual commodities produced by hectare and yields (by weight);
3. Determine yields by weight of each food group: fruits, vegetables, grains, dairy and beverage.

The results are described below.

4.3.2. Land Use across the Blueskin and Karitane foodshed

Using the Agribase 2012 dataset, the foodshed was mapped and classified into six main land use types: extensive pastoral farming; non-productive land use; dairy farming; forestry; intensive animal farming and lifestyle blocks; and horticulture, fruits and viticulture (figure 16).

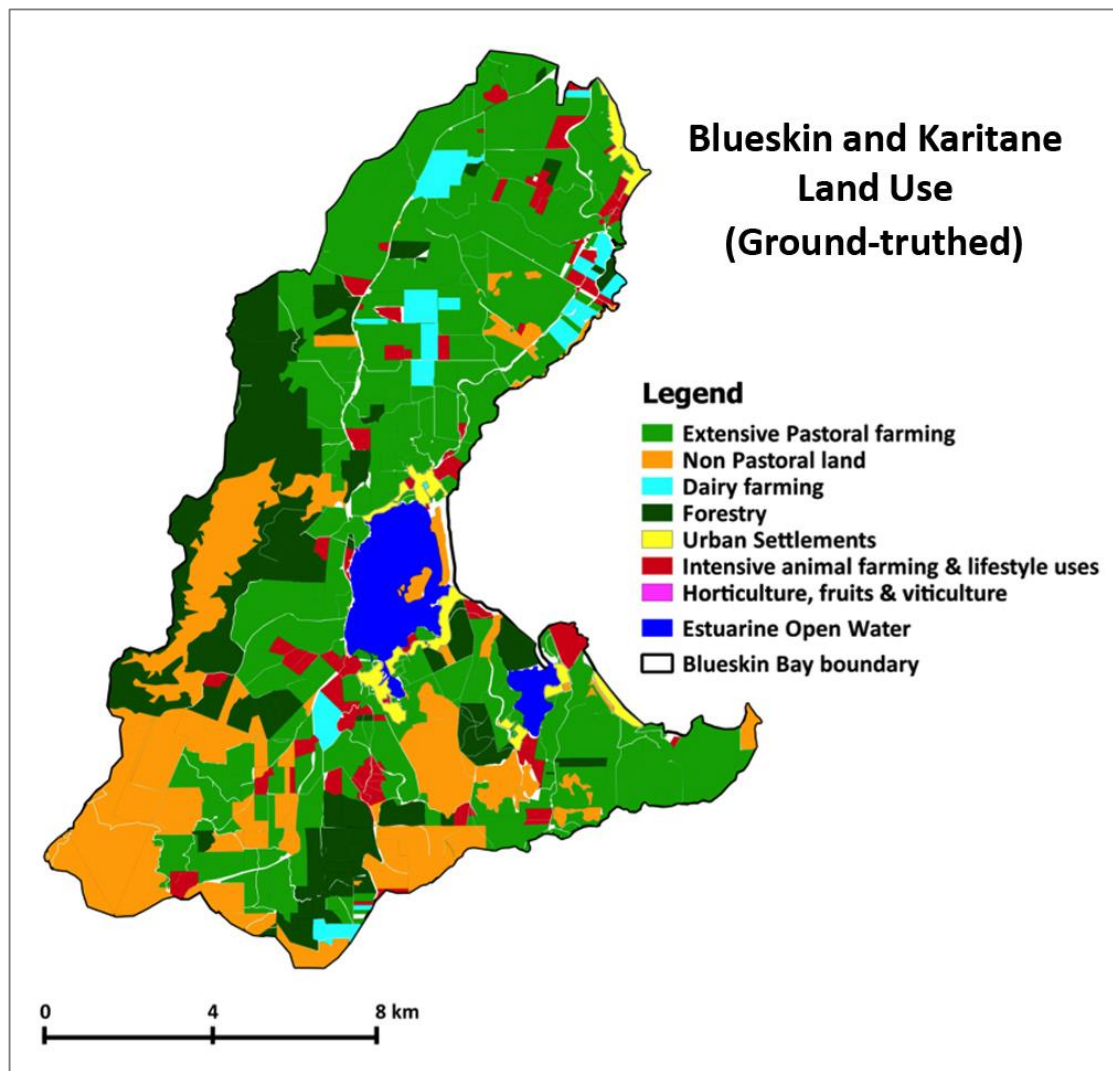


Figure 16: Land use map of the Blueskin and Karitane foodshed (ground-truthed).

The total area covered by the foodshed is 16,866 ha, of which 16,084 ha is reported by Agribase farmland data. The remaining 782 ha is estuarine and waterways. The data was ground-truthed and some adjustments were made based on knowledge of the current land uses. In terms of the total farmland area mapped, almost half (48%) of the land is accounted for in the extensive pastoral farming category. Breaking this down further, 20% of the land is used for mixed sheep and beef farming, 13% for sheep farming, 12% for beef farming, and the remaining 3% for deer and goat farming.

Approximately 23% (3545.9 ha) of land is non-pastoral land that is either part of the public conservation estate, or is privately owned native bush parcels, i.e. 'wild space'. Plantation forests make up 18% (2895.6 ha) of the total reported foodshed area. Dairy accounts for 3.0% (532.5 ha) of land.

Intensive animal farming accounts for nearly one third (31%) of the distribution of land but only 6% of total land use. This category includes lifestyle blocks, horse grazing and grazing for others. Other miscellaneous uses of land include raising alpacas and dog kennels.

Urban settlements account for 2% of the overall land area of the foodshed, at 302.9ha.

Table 5 below provides further detail about the number of farms associated with each land use, the net area of each land use, and its contribution to the total land area of the Blueskin and Karitane foodshed.

Table 5: Land use in the Blueskin and Karitane foodshed

Year	2012			
Category	Farm type	Farm no.	Net Area	% of total
Extensive pastoral land	BEEF	42	1980.3	12%
	DEER	8	489.4	3%
	GOAT	2	18.9	0%
	SHEEP	29	2166.7	13%
	SHEEP/BEEF	28	3261.7	20%
Horticulture, fruit crops and viticulture	VIT	0	0.0	0%
	FRUIT	0	0.0	0%
Cropland	ARABLE	0	0.0	0%
Vegetable farming	VEGE	0	0.0	0%
Dairy	DAIRY	5	532.5	3%
	DRY STOCK	0	0.0	0%
Forestry	FORESTRY	40	2895.6	18%
Intensive animal farming, boutique land uses, and lifestyle use	GRAZING	4	136.7	1%
	HORSE	5	84.5	1%
	LIFESTYLE	66	550.6	3%
	ALPACA	3	5.6	0%
	DOG KENNELS	2	2.8	0%
	OTHER	0	109.8	1%
Non- Pastoral land	NATIVE	19	3006.1	19%
	NOT FARMED	3	437.2	3%
	NEW RECORD	4	102.6	1%
Urban Settlement Areas	URBAN		302.9	2%
Estuarine Open Water			782.4	
Total Foodshed area		256	16866.4	100%
Total land			16084	

Figure 17 (overleaf) provides a graphical breakdown of the land use (from table 5 above) across the foodshed.

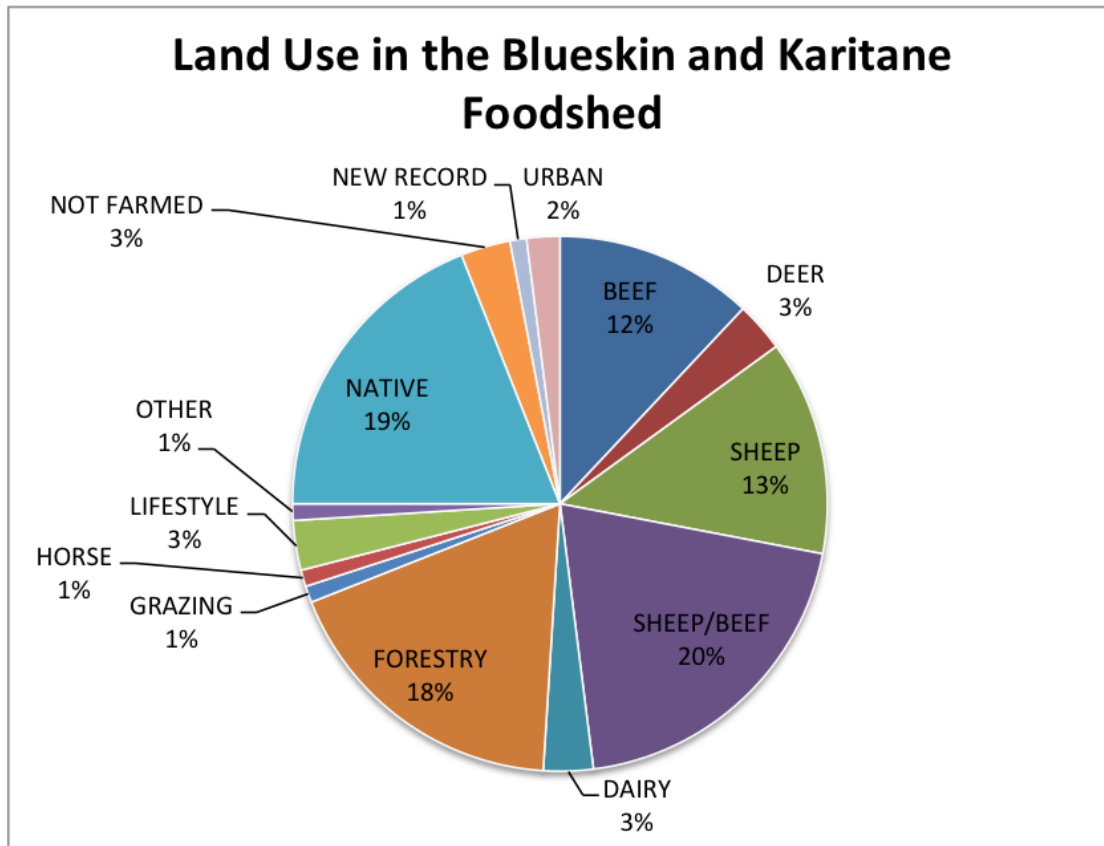


Figure 17: Land use in the Blueskin and Karitane foodshed

4.3.3. The Foodshed Distribution Network

As part of understanding the functionality of the foodshed, the known distribution and food retail outlets that occur within the main settlements are shown in table 6 below. The neighbouring townships of Waikouaiti and Port Chalmers are also included, despite being outside the Blueskin and Karitane foodshed, because they are important retail outlets, as explained below.

Table 6: Known distribution outlets for Blueskin and Karitane Communities

	Roadside stalls	Supermarkets	Dairies / Convenience stores	Pubs / fish and chips / cafes / restaurants
Waitati	3	0	1	1
Karitane	1	0	1	0
Waikouaiti	Unknown	0	2	3
Purakaunui	1	0	0	0
Port Chalmers	0	1	1	11

The map in figure 18 (overleaf) outlines the known food retail and distribution stores.

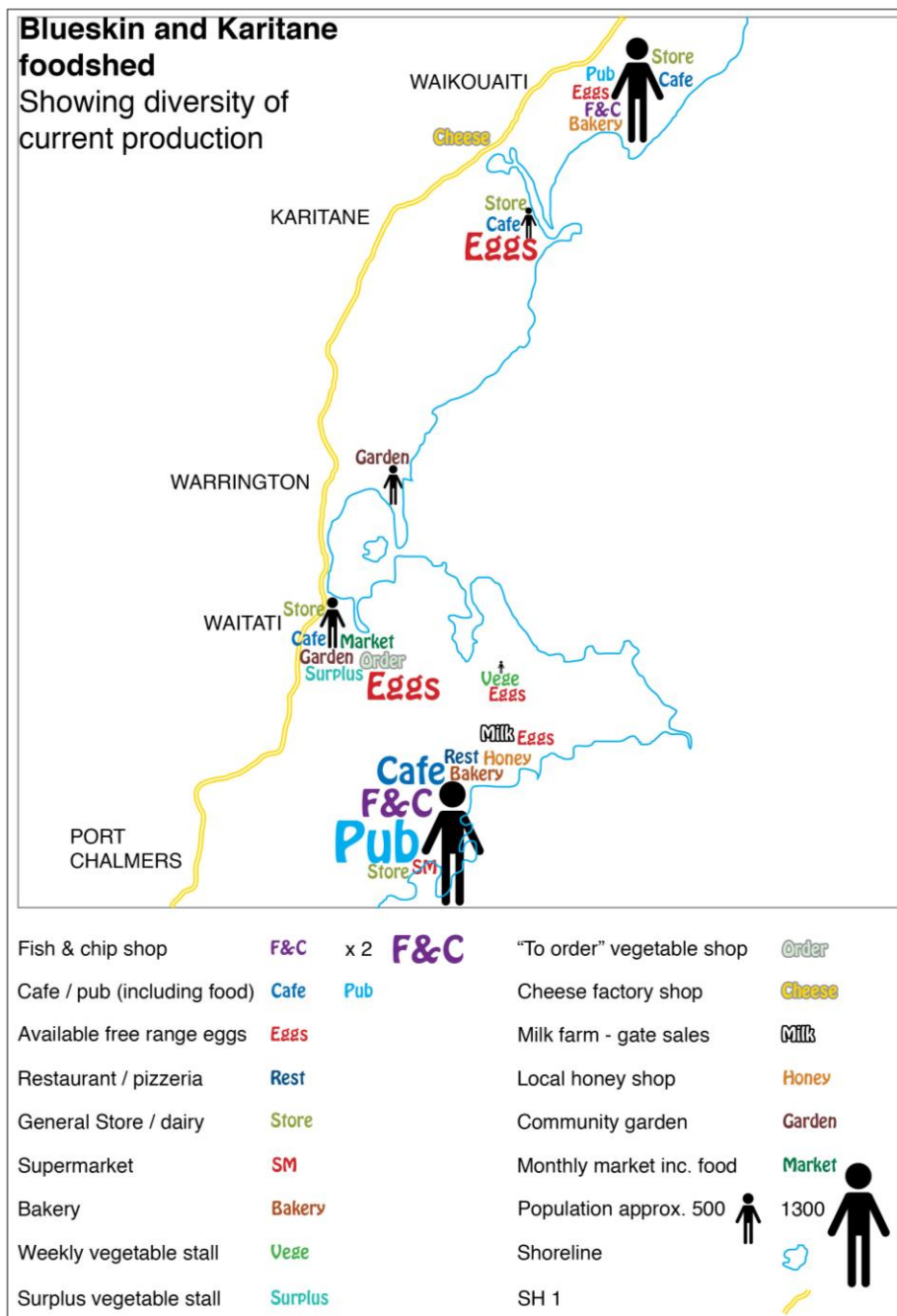


Figure 18: Outline of known food retail and distribution stores

As is expected, those areas with low populations possess very few commercial food outlets. The roadside stalls are all restricted to the sale of vegetables and in some instances, eggs. Typically they are selling produce grown on the property abutting the roadside stall, and as such they are offering very local produce that is seasonal. The Purakaunui outlet is different in that it aims to produce a wider range of vegetables, year round, and will buy from growers outside the immediate locality to supplement its own production.

Within the Blueskin and Karitane foodshed, food retail outlets are small and provide 'top-up' or last minute' service for local residents. Residents in the northern settlements (i.e. Karitane, Seacliff, Warrington) are primarily serviced by supermarkets outside of Blueskin, in either Waikouaiti or Dunedin, while residents in

the eastern settlements (i.e. Long Beach, Purakaunui, Osborne) typically complete their regular food purchases in Port Chalmers or Dunedin. The social connections between the eastern settlements and Port Chalmers are strong and underpinned by the ability to trade goods and services. For a lot of residents in the eastern areas those relationships with harbourside residents resonate more strongly than the relationships with other Blueskin settlements.

The limited retail food outlets (with just one café in Waitati and none in Purakaunui or Karitane) may be due in part to the small population, and also to the ease of access (by car predominantly) to a diversity of food retail outlets in the larger centres.

4.3.4. Food Supply Calculations

4.3.4.1. Meat supply

Predominately a sheep and beef farming area, the Blueskin and Karitane foodshed produces a considerable amount of red meat. Meat supply calculations were based upon model farm scenarios that are common for East Otago.

Specified farming systems

The sheep and beef farming model used is representative of 720 farms based across coastal Otago and Southland. These are moderately rolling clay downlands, but including some steeper hill country. The farms have mostly cultivated pastures, with the balance in improved, but steeper, hill and tussock blocks. The typical production system is breeding ewes with some hogget lambing, and the majority of lambs finished. 20% of lambs are held annually as replacements and 20% of the breeding ewes are culled annually for meat. A small herd of cattle is run, with the majority of calves finished, and 20% held as replacements.

It is important to note that the Agribase dataset identifies significantly higher total livestock numbers than the numbers of livestock that have been identified in this report as being for meat production. The sheep and beef farming system is typically dependent on a farmer's management of a herd of breeding animals, which are only culled for consumption at a time when they are considered to be unfit for purpose. That is, the breeding livestock are normally retained for breeding, rather than for consuming. Primarily it is the offspring of these breeding stock which are culled for consumption annually.

The dairy farming models represent owner-operated seasonal supply dairy farms which do not use irrigation systems, but which do have a run-off dairy grazing block. The Southland model dairy farms have been selected as being the most appropriate match for coastal Otago. The model farm is 182 hectares in size, made up of 152 hectares of milking platform and 30 hectares of run-off. Dairy New Zealand Statistics show that dairy farms in Dunedin run on average 2.72 cows / hectare.

Deer farms are modelled as standalone deer farms, based on 20 family-run deer farms in Southland and Otago. Progeny from the breeding hinds that are not required as replacements are sold for slaughter at between 10 and 18 months old.

Meat production results

As discussed, meat production weights are calculated as loss-adjusted primary weights. They represent the amount of meat that is produced given current New Zealand industry food handling, storage and processing practices. It is the meat weight that results from an animal that is processed within the existing meat processing systems.

The estimated meat that is produced within the Blueskin and Karitane foodshed annually is shown below in table 7. Total annual meat production from the various commercial farming systems is 1306.2 tonnes.

Table 7: Estimated meat production in the Blueskin and Karitane foodshed

	Area (hectares)	Sheep meat (tonne)	Beef (tonne)	Venison (tonne)	Goat meat (tonne)	Total
Sheep Farms	2166.7	353.78				
Cattle Farms	1980.3		388.54			
Sheep and Beef Farms	3261.7	344.61	191.99			
Deer Farms	489.4			25.24		
Goat Farms	18.9				2.04	
Total	7917	698.39	580.53	25.24	2.04	1306.2

4.3.4.2. Dairy production results

The dairy production calculations show two important results – total annual milk production and total annual milk solids production (see table 8).

Table 8: Estimated milk production within the Blueskin and Karitane foodshed

No. farms	Net area (ha)	Yield (L)/ cow / annum	Yield (L) / Hectare / annum	Total Annual Milk production (Litres)	Total Annual Milk production (Tonnes)	Production Milk Solids (Tonnes)
5	532.5	4295	11,682.40	6,220,878.00	6220.88	526.29

Total annual milk production is the actual quantity of liquid milk produced, whereas milk solids refer to the solids components (milkfat and milk protein) that is left after all the water is removed from liquid milk. In New Zealand conventional dairy farmers are paid on the amount of milk solid produced, and as such it is a recognised unit for dairy commodities. For the purposes of this foodshed assessment the milk solid unit is used.

Table 9 (overleaf) shows the further breakdown of milk production into core dairy products. FAO Statistics data (2007) has been used to generate this breakdown of dairy products.

Table 9: Estimated volumes of potential milk products from Blueskin and Karitane foodshed

Product	Yield (L) / Hectare / annum	Total Annual production (Litres)	Total Annual production (Tonnes)
Butter	350.47	186,626.34	186.63
Cheese	1,168.24	622,087.80	622.09
Cream	1,401.89	746,505.36	746.51
Milk	8,761.80	4,665,658.50	4,665.66

4.3.4.3. Egg production results

Egg production within the Blueskin and Karitane foodshed has been calculated from various data sources. The Agribase dataset shows there to be 590 hens in the foodshed (see table 10), and given that there are no known commercial egg operations or poultry meat operations in the foodshed, this project has assumed that these hens all form a part of small-scale farm production.

New Zealand Footprint data, and data sourced from the United Nations Food and Agriculture Organisation⁸ show that on average, medium-producing egg-laying hens lay 200 eggs per annum, and that the average weight of eggs is 50 grams. This data has been used to calculate an estimation of egg production within the foodshed, but must be treated cautiously. Some unknown questions are:

1. How many of the 590 hens are actively laying?
2. How many of the 590 hens are meat-producing hens?

For the purposes of this study we have assumed that 80% of the hens are laying hens and that the remaining hens are not actively laying. We have assumed that the extent of poultry meat production is very limited, and as such is not accounted for here. These assumptions have been based on discussions with a number of residents who own hens.

Table 10: Estimated volume of egg production within the Blueskin and Karitane foodshed

No. hens	No. laying hens	Egg weight (kilos)	Eggs / annum	Annual yield / hen (kilo)	Total Annual Yield (kilo)	Total Annual Yield (tonne)
590	472	0.05	200	10.00	4,720.00	4.72

4.3.5. Mass Balance

This “mass balance” is a way of comparing total production to total consumption for those items produced in the foodshed (table 11, overleaf). As a result it does not account for items such as citrus fruits and coffee, which are frequently consumed but which are not possible to grow in this region.

⁸ <http://www.fao.org/docrep/005/y4628e/y4628e03.htm>

Table 11: Mass balance results for the Blueskin and Karitane foodshed

Commodity	kg/person	Demand (kg)	Demand (tonnes)	Supply (tonnes)	Mass balance
Four-legged meat	66.0	184,800	184.8	1306.2	0.14
Beverages	92.6	259,172	259.2	0.0	0.00
Fruit	109.3	305,958	306.0	0.0	0.00
Vegetables	199.4	558,324	558.3	0.0	0.00
Grains	90.9	254,474	254.5	0.0	0.00
Dairy products	117.2	328,229	328.2	526.3	0.62
Other Foods	80.8	226,337	226.3	0.0	0.00
Poultry meat	34.4	96,348	96.3	0.0	0.00
Eggs	9.3	26040	26.04	4.7	5.54
Fish	26.2	73,291	73.3	0.0	0.00
Total	826.1	2,312,973	2,313.0	1837.2	1.26

The mass balance results shown in table 11 are graphically represented in figure 19 (below) and the demand and supply is diagrammatically shown in figure 20 (overleaf).

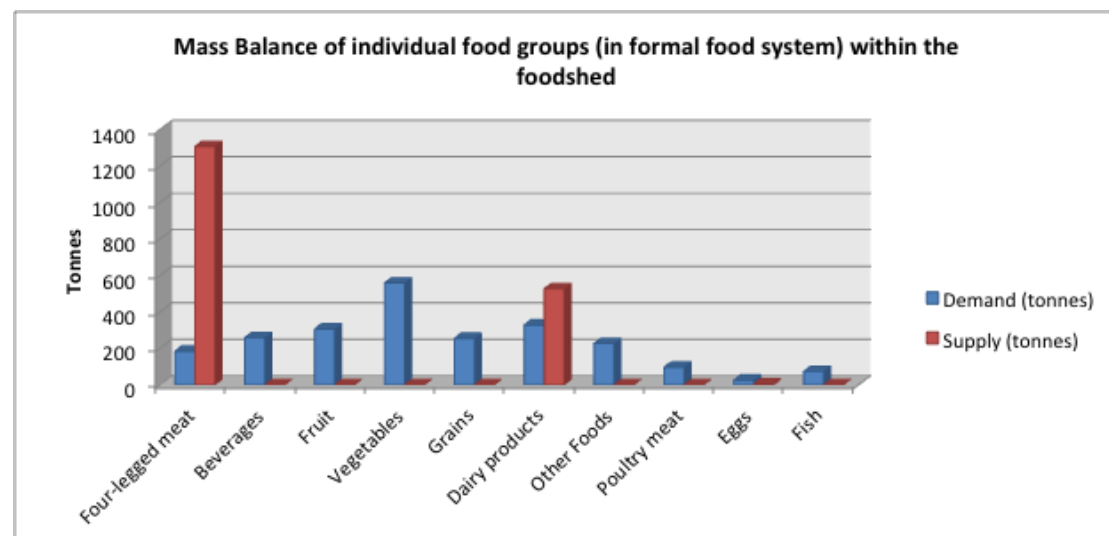


Figure 19: Mass balance of individual food groups in the Blueskin and Karitane foodshed

The mass balance results in table 11 indicate how much more or less of a commodity we eat than we produce. For example, the mass balance number for four-legged meat (beef, sheep, venison, goat and pig meat) is 0.14. This number indicates that the foodshed’s community consumes only 14% of the amount of four-legged meat produced within the foodshed.

Similarly, for dairy products the mass balance ratio is 0.62, showing that residents could consume 62% of the total dairy products produced locally. For eggs the ratio is 5.54, indicating that over 5.5 times the amount of existing production is needed to meet the estimated consumption needs of the Blueskin and Karitane foodshed community.

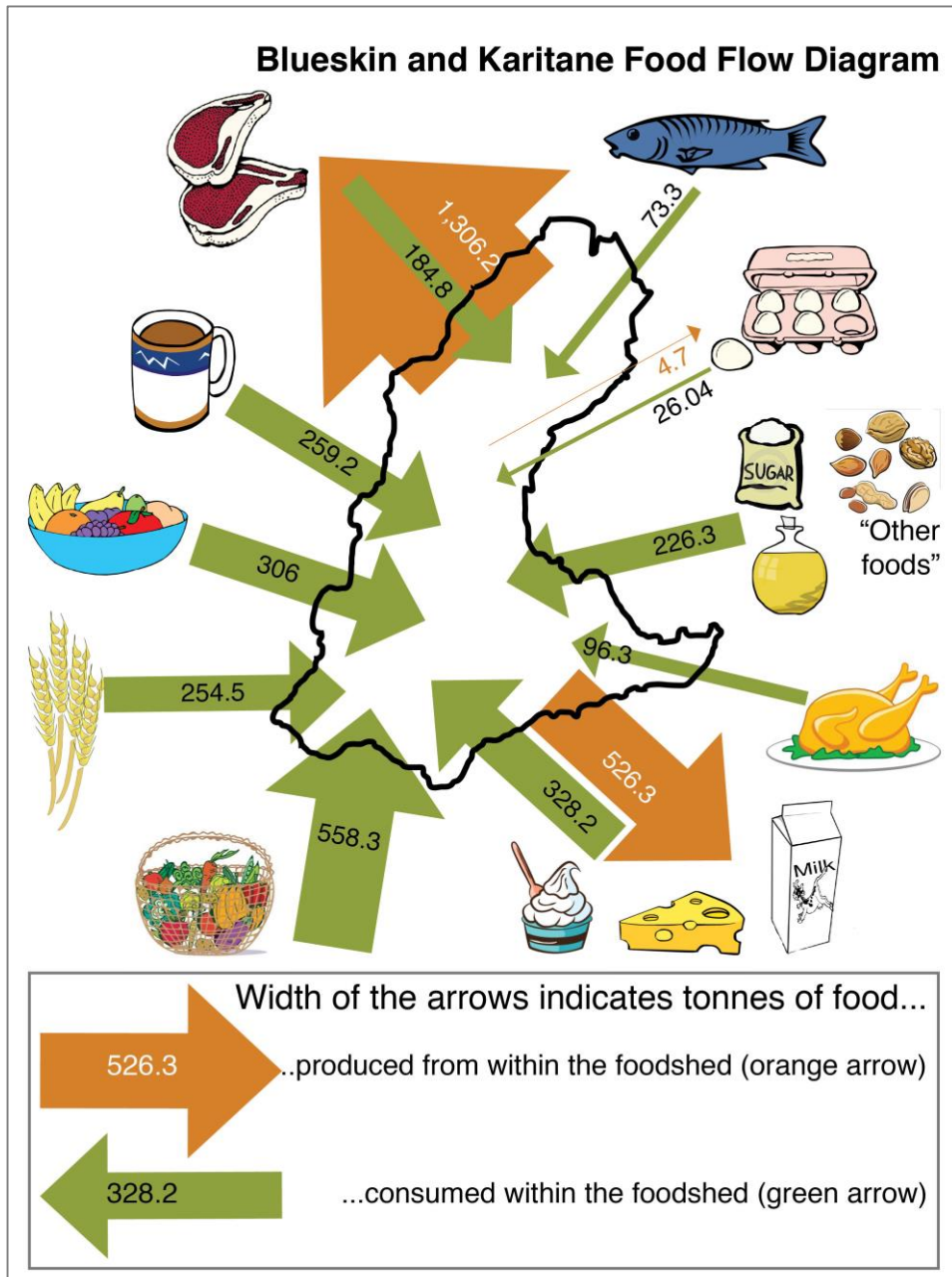


Figure 20: Blueskin and Karitane food flow diagram

For the remaining food commodity groups (fruit, beverages, vegetables, grains, other foods) the mass ratio is not applied because currently these are not grown commercially within the foodshed. There is also a significant amount of backyard production occurring, where residents grow some fruits and vegetables for their own consumption without selling it commercially. Backyard production is not considered part of the 'formal economy' but is considered later in this report.

The overall mass balance of 1.26 shows that more food is consumed within the foodshed than is produced. The diagram in figure 20 (previous page) shows the food flow of the Blueskin and Karitane foodshed; for every 1 tonne of food consumed, another 0.26 tonnes of food are needed to meet the food needs of the Blueskin and Karitane community. This, of course, ignores the potential to change land use so as

to better meet the food needs of the community. A hypothetical change in land use scenario is addressed in Section 4.3.7 of this report.

4.3.6. Blueskin and Karitane foodshed Community Self-Sufficiency Model

Based on modified ecological footprint data taken from the New Zealand footprint project (Lawton, 2012), the amount of land needed by the foodshed's community is calculated and is shown below in table 12. Land required for fish is subtracted from the total land requirement.

Table 12: Blueskin and Karitane foodshed land requirements for self-sufficiency

	Demand kg/person/year	Average yield kg/ha	Ecological footprint	Community footprint (ha)
Fish	26.20	30.0	0.87	NA
Vegetables	199.40	37,556.0	0.01	14.87
Fruit	109.30	16,765.0	0.01	18.25
Grains	90.90	5,215.0	0.02	48.81
Beverages	92.60	2,853.0	0.03	90.88
Other foods	80.80	22,986.0	0.00	9.84
Four-legged meat	66.0	230.0	0.29	803.5
Eggs and poultry	43.70	1,500.0	0.03	81.57
Dairy products *	117.20	988.0	0.11	308.00
TOTAL				1,375.7ha

*milk solids have been used, rather than raw milk liquid.

Table 13 shows that of the 16,084 hectares of land within the Blueskin and Karitane foodshed, just 9% (or 1,376 hectares) is required for self-sufficient food production. However, removing the existing conservation and forestry land from the total amount of available land results in 1,376 hectares of the existing 8,452 hectares of pastoral land being used for self-sufficient food production, amounting to 16% of the existing available pastoral land. Currently, there is significantly more production of meat and dairy products occurring than is required to meet local consumption needs, whilst there is insufficient land allocated to the production of other food groups.

Insight: Obviously, any assumption that all current farmland produces food for local sale is not correct. The majority of land is currently used for pastoral farming to produce meat and dairy products for regional and national sale, and international export, rather than for local consumption. However, this assessment has demonstrated the theoretical ability for food self-sufficiency if considered through a lens of quantitative food yield modelling.

There are certain items, such as citrus fruits, coffee and tea that are unsuited to the climate and will never be produced locally. However, some food groups could be grown in much increased quantities so as to better meet local consumption needs.

Examples include vegetables, fruits and grains which are currently heavily consumed, but which are not being produced in scale within the foodshed.

Table 13: Blueskin and Karitane foodshed land required for self-sufficiency compared to current land use

Blueskin Community farmland required for self-sufficiency compared with current land use.									
Category	Vegetables	Fruit	Grains	Beverages	Other food	Meat	Eggs	Dairy	TOTAL
Required (ha)	14.87	18.25	48.81	90.88	9.84	803.5	81.57	308.00	1,375.73
Current (ha)	0.00	0.00	0.00	0.00	0.00	7917.00	3.00	532.00	8,452.00
Difference (ha)	14.87	18.25	48.81	90.88	9.84	(7,113.50)	78.57	(224.00)	(7076.27)

Table 13 provides detail as to the theoretical changes in land use that would need to occur to achieve food self-sufficiency within the foodshed, showing that to achieve this would require significant changes in land use. The total required land for vegetable and fruit production is 33.12 hectares. The total difference between required and current land is a negative figure because of the large extent of land used for meat and dairy production, neither of which are required to be that high for self-sufficiency.

4.3.7. Hypothetical Changes in Land Use.

Understanding whether there is land that is suitable for growing the breadth of food types that is required for community self-sufficiency is an exercise in evaluating climate variables, soil types and topography. A technical exercise, it does not take into account the economic viability of changing land use away from existing land use, nor does not take into account the motivations and aspirations of the existing land owners. As such, the following discussion must be considered as a high-level evaluation of the potential to grow alternative food crops on certain areas of land, and not as a recommendation to change land uses.

Climatic data and soil information from the Otago Regional Council's 'Grow Otago' data base, soil classification data from Land Resource Information System (LRIS, 2000), and topographic information from Google Earth have been used as the primary data sources in this evaluation. Using these sources, land within the project area has been assessed for its potential to grow a diversity of food crops. Local growers and farmers have also been engaged in this process, providing local knowledge about what can be feasibly grown here, and also, what has historically been grown here.

The main area of land which has potential to grow a diversity of crops is the alluvial fan which sits adjacent to Waitati township, highlighted in the photo in figure 21 below. The soil is categorised as a 'Weathered Fluvial Recent' soil; it is a weakly developed soil with a distinct topsoil and an absence (or minimal) subsoil. It is a soil that is naturally fertile due to the sediment deposited from previous flood events.

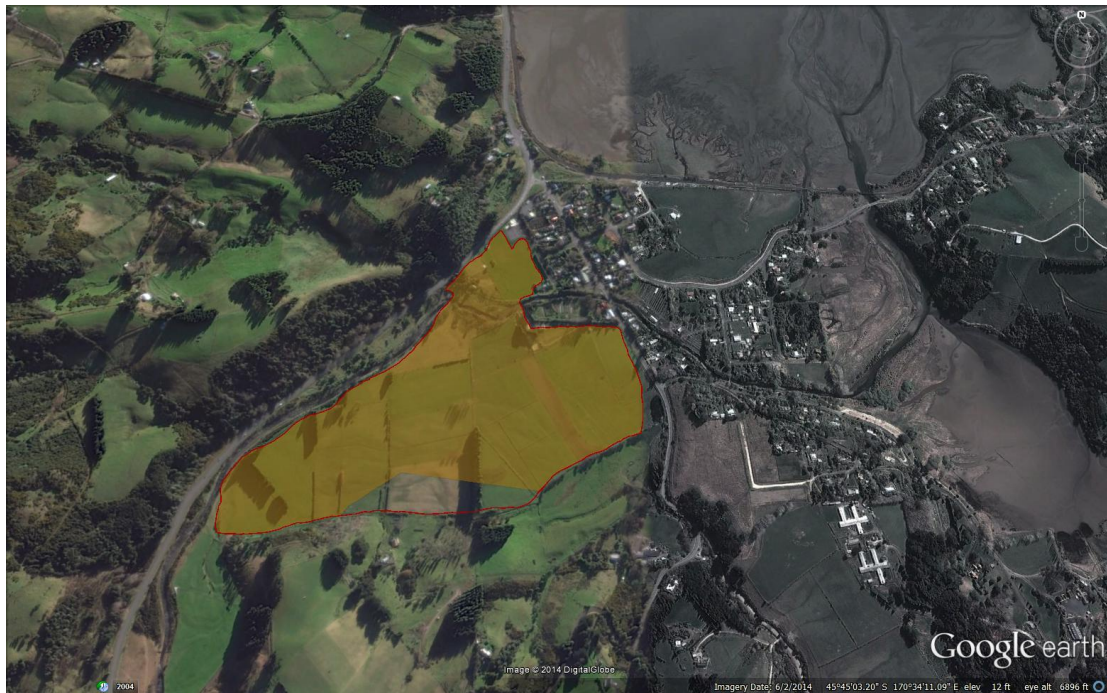


Figure 21: Google Earth image showing an area of high potential for growing a variety of food types within Waitati

The area marked in figure 21 is 33 hectares in size, coincidentally being the same size of land required for community self-sufficiency of fruit and vegetables (as described in Table 13). Parts of this area were previously used for market gardening up until the 1970s⁹, when small-scale market gardening became less economically viable. Its fertility and ease of accessibility mean it is appropriate land for horticultural production, and also for some fruit (apples, plums) and nut crops.

As discussed in Chapter 3, parts of the lower reaches of the alluvial fan is known for its propensity to flood. The most recent flood occurred in April 2006, areas marked B and C inside the red lines in figure 22 (overleaf) shows the approximate area of flooding during the April 2006 event (DCC, 2006). Area “C” in figure 22 covered a small part of the highlighted land in figure 21.

Other areas of land within the project area were assessed for their potential to grow a variety of crops, but apart from very small parcels of land in close proximity to urban settlements, it appears that the majority of fertile land has been built upon.

⁹ Mark Dickson, Personal Communication, 2nd April 2014



Figure 22: Civil Defence and Rural Fires, Waitati Flood Report showing April 2006 flood marked B and C (DCC 2006, p.10)

North of the foodshed project area there is an area of land, adjacent to the Waikouaiti river, which has fertile soils, is in close proximity to a ready source of freshwater, and is of easy terrain. Again, this parcel of land is suitable for a variety of food growing uses, and benefits from higher sunshine hours than Waitati to the south.

Further north of Waikouaiti township, the upper reaches of the alluvial fan were historically used for growing grain crops. Again, the topography is easy, and the soils possess naturally high fertility¹⁰.

4.4. Summary of Findings

To summarise, this chapter has explored available data sets in order to assess availability of land, commercial production of food and how much food is required within the Blueskin and Karitane foodshed. The baseline assessment was an exercise in understanding this specific foodshed's ability to be self-sufficient in food production. It is clear that there is a significant imbalance between supply and demand within the foodshed. Red meat and dairy products are produced and largely exported out of the foodshed, as a result of their place in the formal economy and as part of the conventional food system. Correspondingly, fruit, vegetables, grains, beverages and eggs are commonly sourced from outside the foodshed, via the conventional food system and through the formal economy.

¹⁰ www.growotago.orc.govt.nz

Chapter 5.

Appraisal of the Local Food Landscape - the Informal Food Economy

5.1. Introduction

Scratch beneath the surface and it quickly becomes obvious that there is a hive of localised food production activity happening within the Blueskin landscape. Data sets will not pick up this activity, primarily due to its informality, scale and high level of diversity.

Lifestyle blocks account for an estimated 3% of the 16,084ha of land area within the foodshed area, amounting to 483 hectares. “Other” land use categories account for an additional 1% of land area, and the urban environments for an additional 2%. For a number of reasons these areas are collectively important when considering how the consumption needs of the Blueskin and Karitane communities could be met. Firstly, the lifestyle blocks are typically clustered in proximity to the urban settlements and are well-connected with these urban areas, both socially and from the perspective of provision of services. Secondly, they are sometimes managed intensively and diversely, producing crops and goods that do not enter the typical export-commodity markets that are the primary focus of commercial producers. Given that lifestyle blocks are usually not managed for commercial objectives, they offer the potential for landowners to be far more flexible in how they use the land, typically with far less focus on financial returns and economic profitability. Lastly, some lifestyle blocks are not well utilised for their food growing capability and are often fallow, thereby providing potential for land use change into food production.

The urban areas of the Blueskin and Karitane foodshed are estimated to amount to 2% of the land area, or 322 hectares. Obviously much of this area is occupied by houses and built infrastructure, but there is also significant greenspace in these areas of low-density housing. The food production potential is significant and, as has been shown during the community interviewing process, is already a strong component of current food production in the area.

5.2. Summarised Methodology for Understanding the Informal Food Economy

In order to gain a better understanding of food production in Blueskin and Karitane lifestyle and residential properties quantitative research methods were utilised. A typical case sampling quantitative research methodology was used. A full description of this methodology is found in *Appendix B: Methodology for understanding the informal food economy*.

5.3. Findings of Research into the Informal Food Economy

In this section of the report we present the findings that arose from the results of the quantitative research that was implemented across the informal food economy of the Blueskin and Karitane foodshed area. The objectives of the quantitative sampling were two-fold. Firstly, to better understand the extent of non-commercial food production occurring across the project area. The second key objective was to understand what community members did with any excess food they may be producing, how they valued food, and how those values translated into personal actions. The results of these objectives are described below and are provided in graphical form, for ease of reader interpretation.

In considering these findings it is important to remember that these results were collected from a few key questions gathered from a small sample size. Caution must be applied, as the findings might not be viably extrapolated over the fuller population. Moreover, these findings are a snapshot of current growing habits in the spring months (September 2014) which could promote a possible bias due to people either feeling positive about growing food, or alternatively, feeling overwhelmed by the workload within their gardens.

5.4. Home Grown Food

20% of the households that are included in the study are from large lifestyle properties (15 hectares and over), 20% are from small lifestyle properties (2-4 hectares) and 60% are from residential properties (1 hectare and less). Out of the households surveyed over three quarters are currently growing some item of food (figure 23), which is at least one of the following: animals for meat, eggs or vegetables (minimum of potatoes or greens).

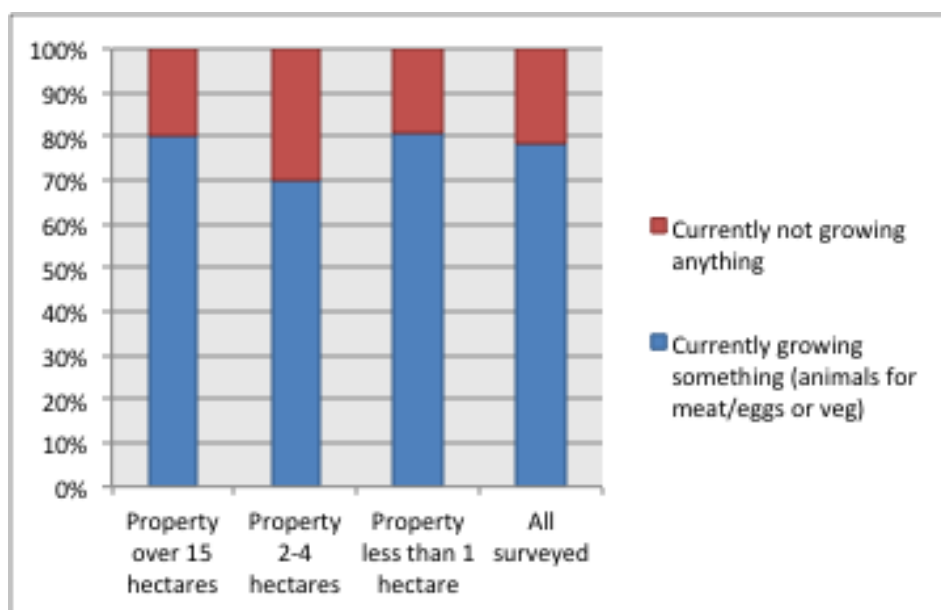


Figure 23: Percentage of total surveyed growing or not growing food shown from different property types

The graph in figure 23 illustrates that approximately four out of five households (80%) from the residential and large lifestyle properties are currently growing their own food whilst just over two thirds (70%) of the households from small lifestyle properties grow their own food.

5.4.1. Reason Households are Not Growing Food

The graph in figure 23 above indicates that 22% of all households surveyed do not currently grow their own food. Those households which indicated they did not grow food were asked why. Their responses are shown in figure 24 and are discussed here. Over half of these households feel they are too busy (55%) to grow food. 9% implied they had tried before to grow some foods (specifically tomatoes) but had not been successful. Another household suggested they did not grow because they couldn't as their home is south facing and has no sun for four months of the year.

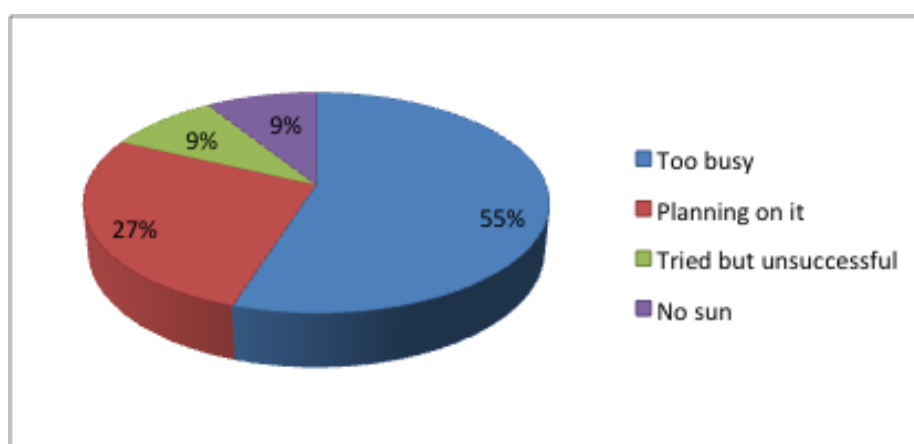


Figure 24: Reasons households are not growing food

The research shows that from those who indicated they are not currently growing food over a quarter are planning on growing something in the near future, and each of those households listed a wide variety of vegetables, fruit and animals they intended to care for. In addition to the above mentioned 78% who are currently growing food, a total of 84% of all households surveyed are either currently growing or will soon be growing some food items.

Two households indicated they weren't growing anything but clearly were. For example, one elderly person said she can't grow anymore because she was physically unable to, yet we noted planters containing tomatoes, zucchini and peas and when asked about these the person listed off a wide variety of vegetables still being grown in planters and pots. Simply the vegetables were not being grown in the manner or at the scale she had previously been accustomed to. This sentiment was common for a few other older people who may have become less able to grow and supply all of their own vegetables over recent years. All of these older people are still currently growing at least three of four different types of fruit and vegetables in their gardens or planters. These households have been categorised as growing food.

5.4.2. Variety of Food Grown and from which Property Size

The variety of food grown/raised in urban and lifestyle settings includes meat, vegetables, fruit, berries, nuts, and eggs from chickens. No one indicated they were growing grains (see figure 25).

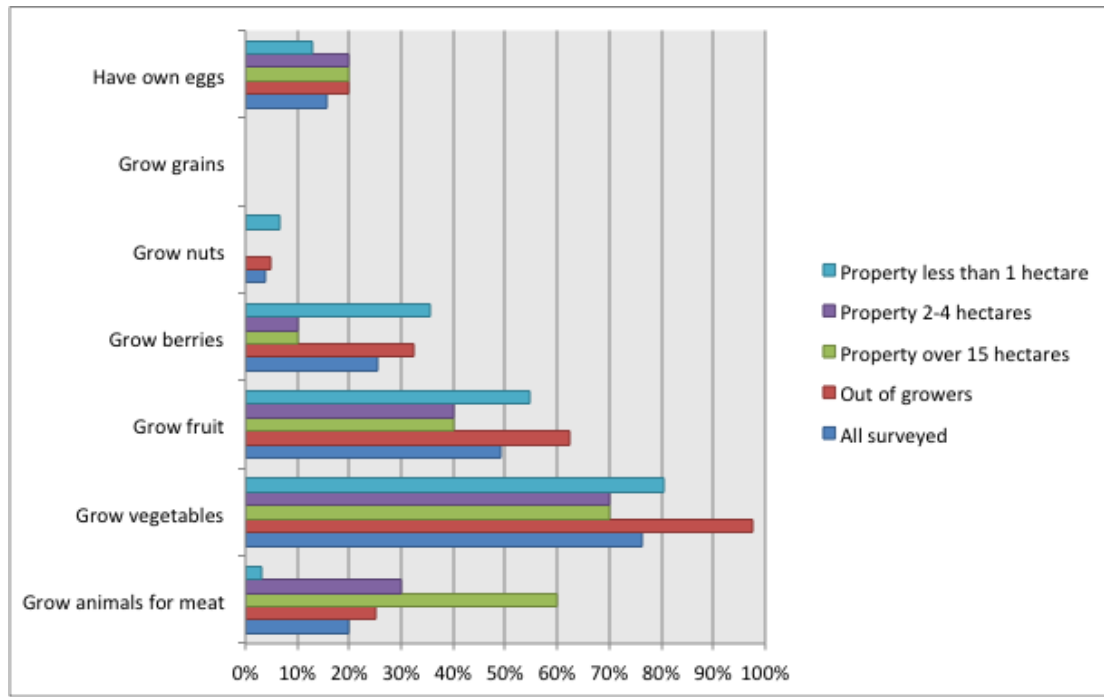


Figure 25: Variety of food currently grown

The graph in figure 25 shows that out of those households currently growing food 98% indicated they are growing their own vegetables, the minimum of which tends to be either tomatoes, greens (lettuce, kale or silver beet) or root vegetables (mainly potatoes). Building on this base level of growing tends to be other root vegetables (namely beetroots and carrots), brassicas (broccoli, cabbage and cauliflower), legumes (a variety of beans and peas), cucurbits (cucumbers, courgettes and pumpkins), alliums (garlic and onions) and corn (although by only one household in the residential area).

A significant number of households grow vegetables. Four out of five residential households (from all surveyed) and over two thirds of both lifestyle households are currently growing vegetables.

The results of this research show that the large lifestyle properties are growing more of their own meat with 60% of all large lifestylers farming animals for meat, typically lamb and/or beef. Only 30% of the small lifestyle properties are growing meat for themselves and 3% in the residential (this was on a 1 hectare property).

Fruit was the next popular food group to be grown, with the staple being apples, plums and pears. Others were successfully growing feijoa, peach, sour cherries, apricots, nectarines and, in one household, limes. Fruit planted but not yet producing included olives and lemons, and a couple of households indicated that cherries grow well but are often eaten by birds prior to harvest. Berries were the next popular with

staples being gooseberry, blackcurrant, raspberry and strawberry. Nuts are the least popular food item grown, with only one in twenty of the households growing a crop of nuts. Crops tend to be from hazelnuts and walnuts only, although more people than shown in figure 25 indicated that they had planted nut trees but the trees had not produced a viable crop to date. These trees include almonds and sweet chestnuts. No households were growing grains.

The graph in figure 25 also shows the volume of eggs produced by each different property size, with 20% of both lifestyle properties producing their own eggs and 13% of residential properties.

Unsurprisingly, we can conclude that it becomes easier to grow your own with more space; large lifestyle properties are growing a variety of vegetables as well as meat. However, it is important to note that the larger lifestyle block owners are growing proportionally fewer vegetables than those in residential properties. This is described further below.

5.4.3. Space Used to Grow Vegetables

In order to understand more about the food production within the urban and lifestyle block setting, the space required to grow this food was explored. When asked about space used for growing food, the focus was on the vegetable garden. With this in mind, a significant amount of space is used to grow vegetables; from those who are growing the average total space used is nearly six car sizes worth (56.7m²).

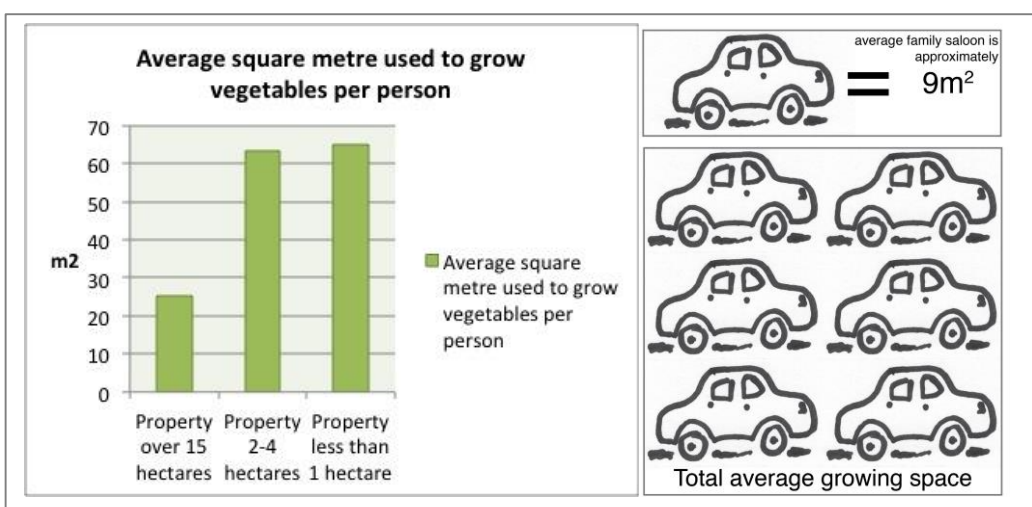


Figure 26: Graph shows the average per person square metre of space used to grow vegetables and image shows total average growing space is equivalent to 6 average size cars

The graph in figure 26 shows the average amount of space used per person per property type and illustrates that typical residential households are growing vegetables in approximately three times the amount of space as the large lifestyle property households. This means 65m² (approximately 7.2 car sizes worth of growing space) is the average per person for residential households versus 25m² (approximately 2 and a half car sizes worth of space) is the average per person for the large lifestyle properties.

These differences reinforce the findings described in the previous section that indicated lifestyle property households grow fewer vegetables than residential households. The amount of space used is significantly less.

5.4.4. Growing Seasonal Food

When asked about growing food seasonally the responses focused on the vegetable gardens and fruit or berry orchards more than meat production. Bearing this in mind, of all of the households who are growing food (meat included) two out of five are growing seasonally, whilst another third of the households are trying to grow food all year but find it very hard and don't tend to succeed. From the 27% who are growing all year round (shown in the graph in figure 27) most indicated that they had successful potato, brassica, silverbeet, kale, and/or bean perennial crops.

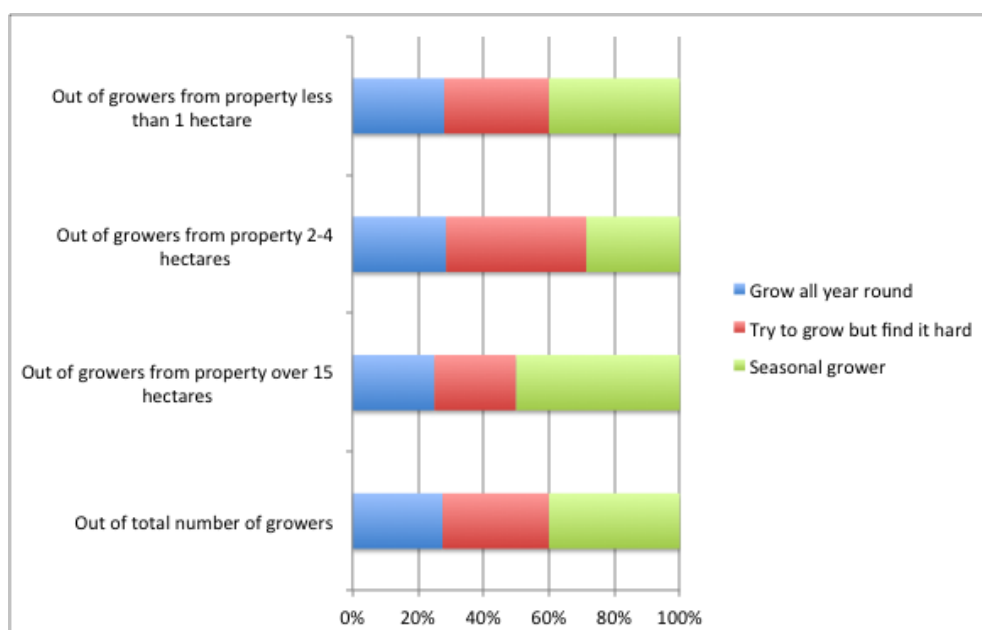


Figure 27: Seasonal versus perennial growers and from which size property

5.4.5. Types of Diet and Family Types

Considering the variety and seasonality of food grown, it is important to identify the types of diets and family structures that make up the households surveyed. Therefore the focus in this section is diets and family types. The graph in figure 28 (overleaf) shows a breakdown of the different types of diets in the total number of people included in the survey and in the households from each property type.

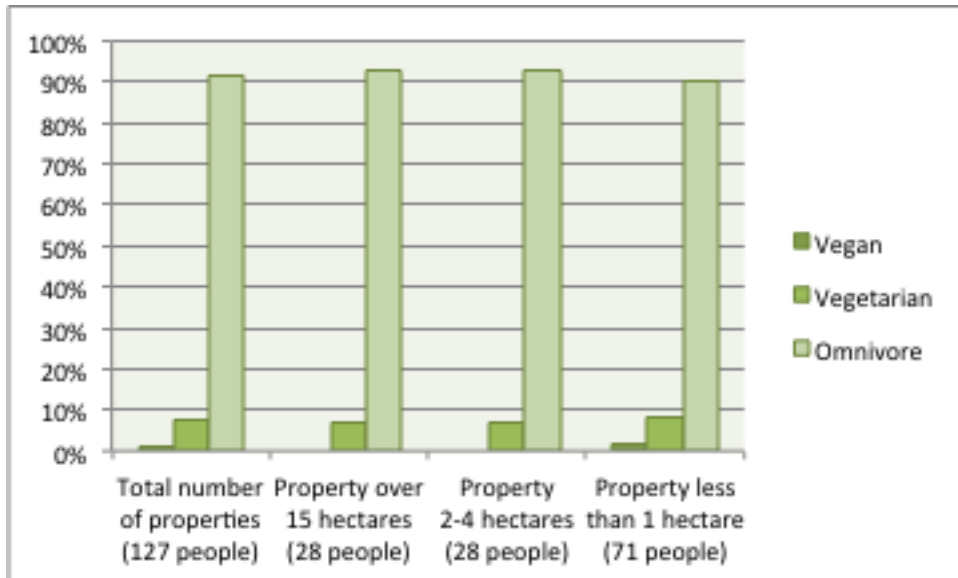


Figure 28: Graph to show different types of diet in each property type

The graph (above) clearly shows that 91% of all people covered by the study are omnivores, less than 1% (i.e. one person and not one household) indicated they are vegan and 8% are vegetarian. The breakdown for each property type was almost identical with 7% or 8% vegetarian within each group.

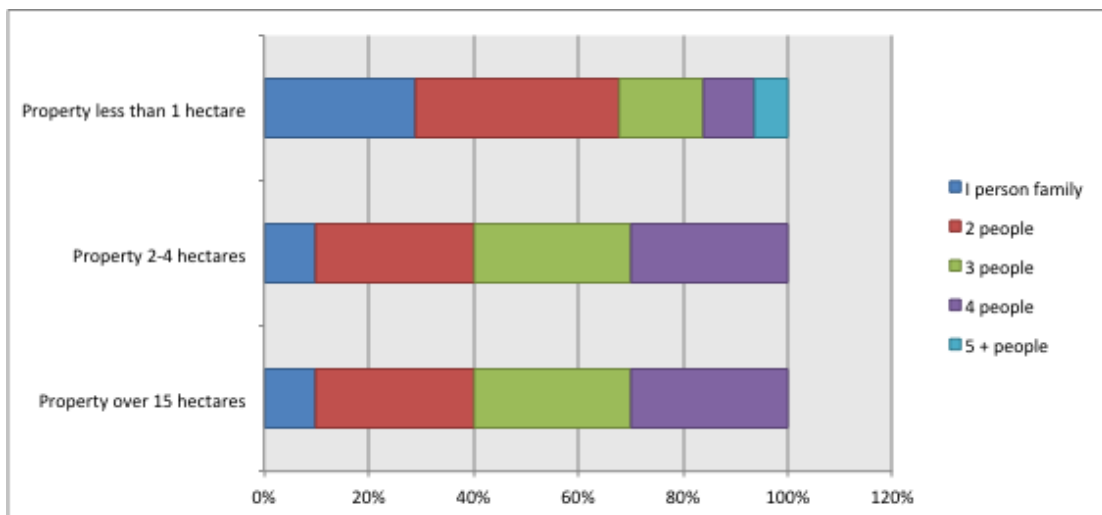


Figure 29: Graph to show size of family per property type

The graph in figure 29 shows the family sizes in each of the property sizes. 29% of residential properties have single person occupancy, which is clearly different to the 10% single person occupancy for both size lifestyle properties. Residential households also have more couples than the lifestyle properties with 39% versus 30%, yet have fewer families with three people and over. Interestingly, both of the lifestyle property sizes have identical breakdowns of family types.

5.4.6. Self-Sufficiency with Home Grown Food

When asked if they thought they were self-sufficient in their food growing, most of the households (who are growing food) acknowledged that they were not. Respondents rated themselves in how self-sufficient they actually are, as shown in figure 30 below.

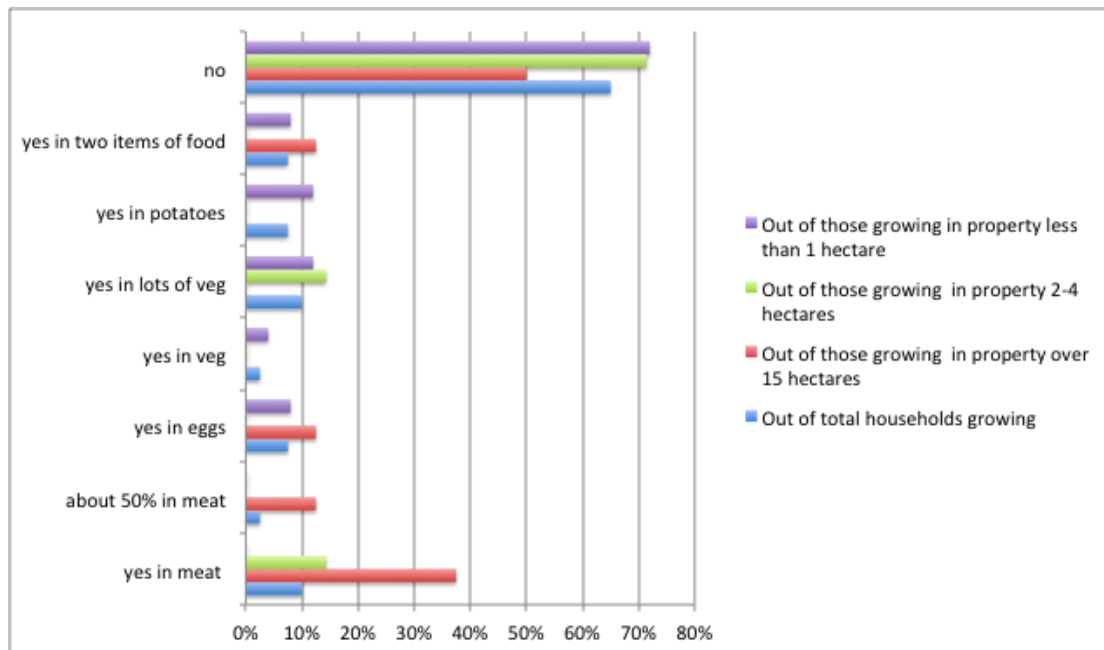


Figure 30: Self-rated self-sufficiency

The graph above shows that 65% of all the food-growing households indicated they did not believe they were self-sufficient in any type of food growing activity. Not one household was completely self-sufficient in all of the food types in the survey (meat, vegetables, fruit, nuts, grains and eggs). Some indicated that it is not possible due to our climate, whilst others indicated that they are aiming to be self-sufficient but acknowledge they are not there yet.

The graph also shows a small number of households indicate they are self sufficient in one stand-alone item, such as meat, eggs or vegetables. These findings correlate with previous findings that indicate large property households are more successful in meat production; with over one third of the large lifestyle households stating they achieve self-sufficiency in meat. The results also show that one in twelve growers (8%) are self-sufficient in two or more items of food (such as meat and eggs, or eggs and vegetables).

Very few households claim to be completely self sufficient in all of their vegetable requirements, in fact only one household in the residential area asserted they had achieved this significant milestone. This household was an elderly couple who had an immaculate garden and obviously grew a lot of fruit and vegetables and have done so for the majority of their lives. Another three households in residential properties and one in the small lifestyle property indicated they were close to being self sufficient in most of their vegetables.

This information is supported by the following graph in figure 31, which shows the percentage of households (from those that are currently growing food) that buy in additional vegetables (meat and eggs are not shown on this graph).

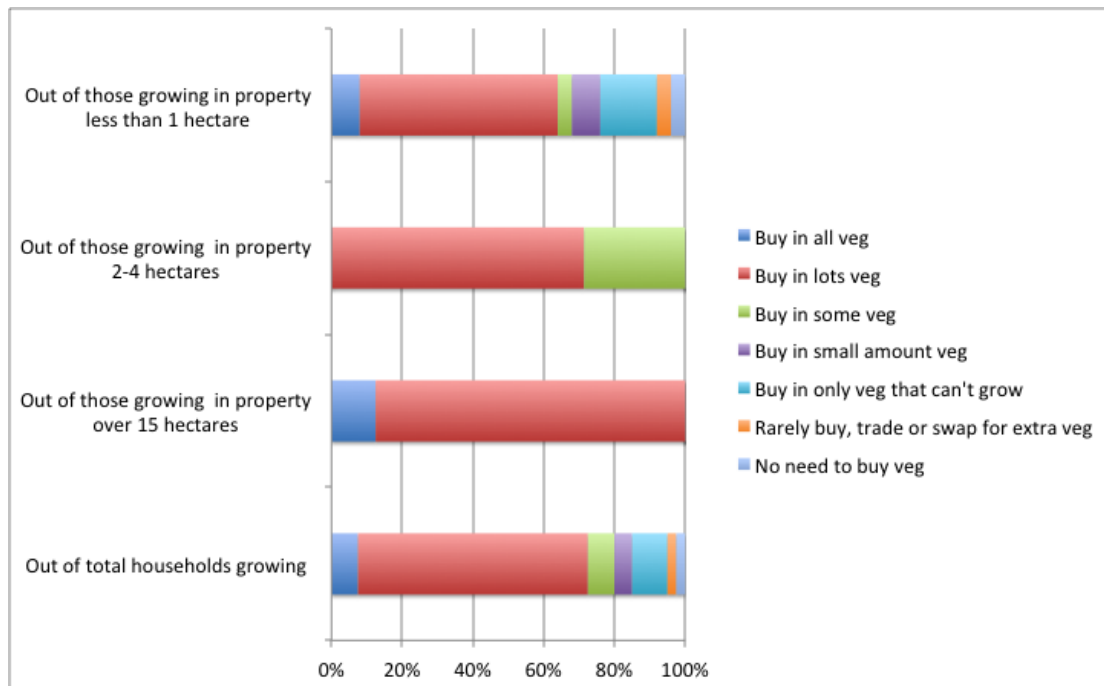


Figure 31: Percentage of households indicating the need to supplement home grown vegetables from external sources

The graph in figure 31 shows how 73% of all households growing food buy in significant amounts (65%) or all (8%) of their required vegetables from external sources. Supporting these findings, 100% of all the large lifestyle properties are also in one of these two categories. These findings indicate that despite the large property sizes and effort to grow vegetables, more importance and success is placed on growing animals for meat. Interestingly, 100% of the small lifestyle property households fit within the second and third categories (buy in lots and buy in some). It is the residential growers who have the widest variety of responses, including rarely buying-in vegetables and no need to buy-in vegetables. However, nearly two thirds of all residential growers are still supplementing all or lots of their vegetable requirements from external sources.

5.4.7. What Type of Surplus Food

Following on from the self-sufficiency of households, we explored what households do with any surplus food they grow. The research shows that half of the households that indicated they grew food also suggested that they had a surplus of vegetables they had grown at some point during the year.

The graph in figure 32 (overleaf) shows that fewer than 40% of the households on the large lifestyle properties specified they had a surplus of meat, and only the residential growers signified a surplus of eggs. What was clear was that there is surplus food available but it tends to be seasonal and not consistent.

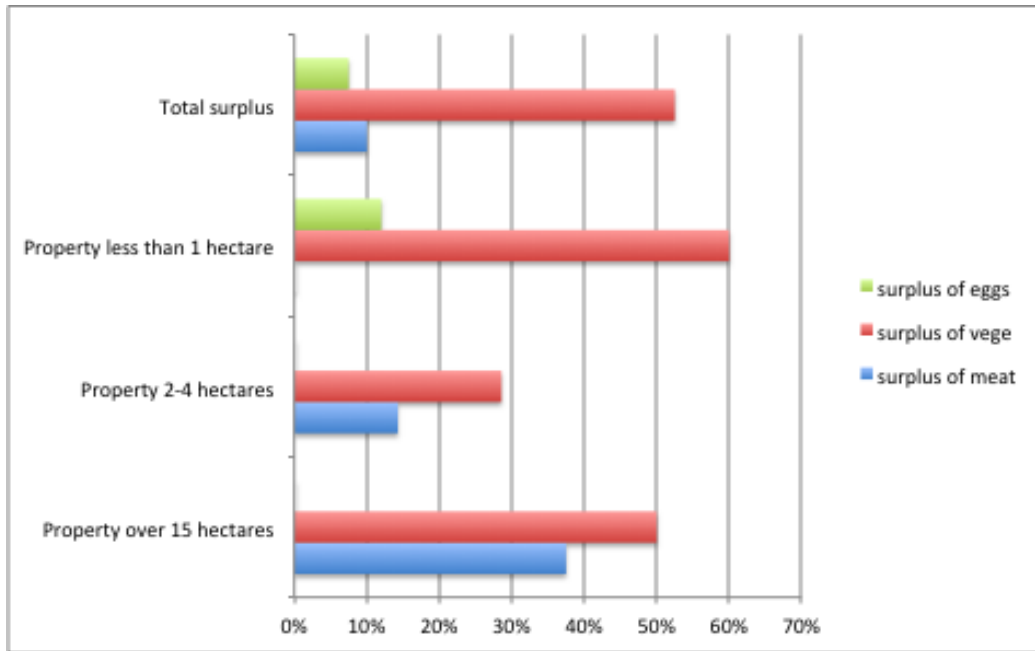


Figure 32: Graph shows percentage of households (that grow food) from each property type that has surplus

5.4.8. What Households do with Surplus

Understanding what those residents who grow their own food do with the surplus is an important part of informing our understanding of the informal food system. The chart in figure 33 illustrates the percentages of households from all of those who indicated they had surplus who keep the excess for themselves (freeze / preserve), those who generously donate their excess to family, friends or those in need (give away) and those who participate in the informal food system and barter, trade or swap food for other food, goods or services.

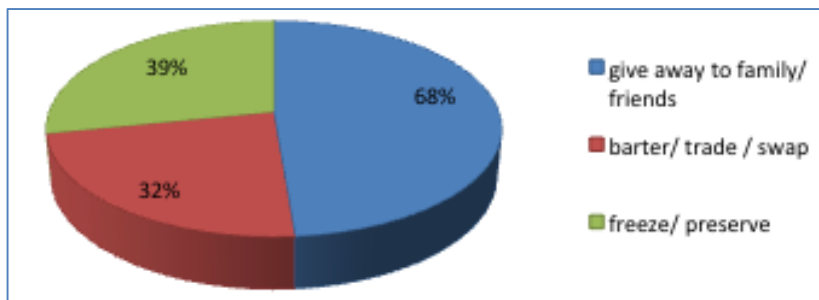


Figure 33: What people do with their surplus food

The chart in figure 33 demonstrates the importance of social connectivity and sharing amongst those people who grow food. Giving food away to family and friends was the most common way of dealing with surpluses, with an average of 68% of growers with surplus food doing this. Freezing and preserving was also a relatively common activity with over one third of all households with surplus food finding ways of keeping the surplus for future use.

When considered in more detail, preferences between each of the different sized property categories become apparent. The graph in figure 34 shows a wide range of responses categorised by property size.

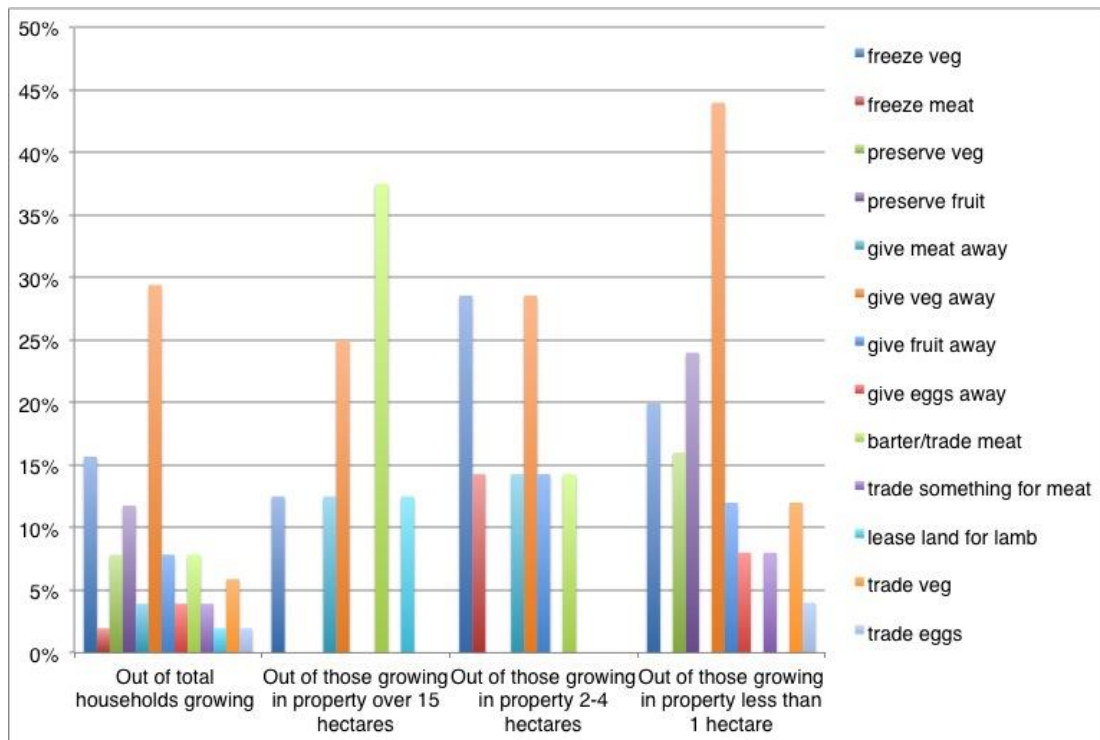


Figure 34: Graph to show what households do with their surplus food

For the large lifestyle property households (over 15 hectares) by far the most popular activity is bartering and trading meat with 38% of those growing food participating in this activity. One quarter of them give away vegetables, with a smaller amount giving away meat.

For the small lifestyle properties (2-4 hectares) a quarter of them froze or gave away their home grown vegetables. A smaller percentage of them participated in the bartering or trading activity with meat, compared to the larger lifestyle blocks.

An outstanding activity for the residential property households was the sharing of their home grown vegetables, with nearly half of the households participating in this activity. Another interesting finding within the residential group is that the categories “trading for meat” and “trade eggs” were not evident in either of the other groups. This provides another indicator of the networking that occurs within the informal food system.

The findings of this section indicate that the small lifestyle blocks are not yet producing enough of either meat or vegetables to participate in sharing with friends, neighbours and family. Residential property owners are by far more generous with sharing their food whilst the larger lifestyle properties are well set up for bartering and trading.

5.4.9. Valuing Food

Considering the high value that households place on growing food, it is interesting to know what percentages of households place importance on knowing where their externally sourced food comes from. Responses to this question did not differ markedly amongst people within the different property sizes, however of interest was that there were more people in the group that do not grow food who place less

significance on knowing where their food comes from (20% of non-growers indicated that it is not really important to know where their food comes from, compared to 10% of growers).

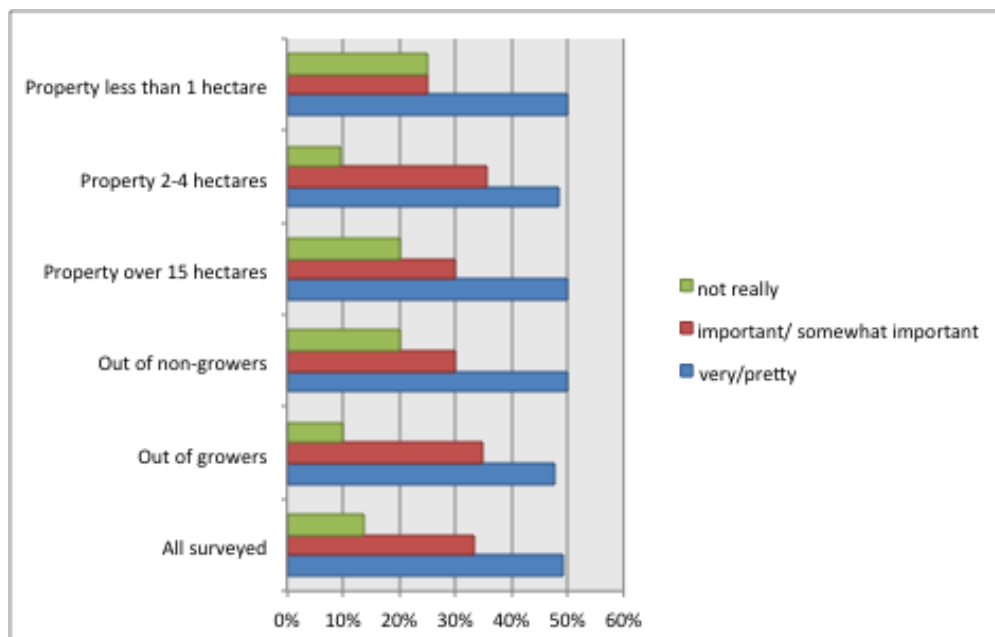


Figure 35: How important is it that you know where your food comes from?

The graph in figure 35 illustrates that 81% of all households surveyed indicated that it is important (48% = very/pretty important and 33% = important/somewhat important) to know where their food comes from. It is important to note the variety of values that are associated with this desire which range from valuing New Zealand and/or local produce (including wanting to support New Zealand food above any other county and specifically avoiding protein products from some countries) to dietary considerations such as households having gluten free, lactose intolerant, or vegan family members, or concern over organics, social equity or animal welfare to financial constraints and the need to hunt out cheaper food or to save on fuel (travel) costs.

5.4.10. Support for Local Initiatives

After exploring the level of importance that households place on knowing where food comes from, we explored whether local food initiatives would be supported (in principle) by the households surveyed.

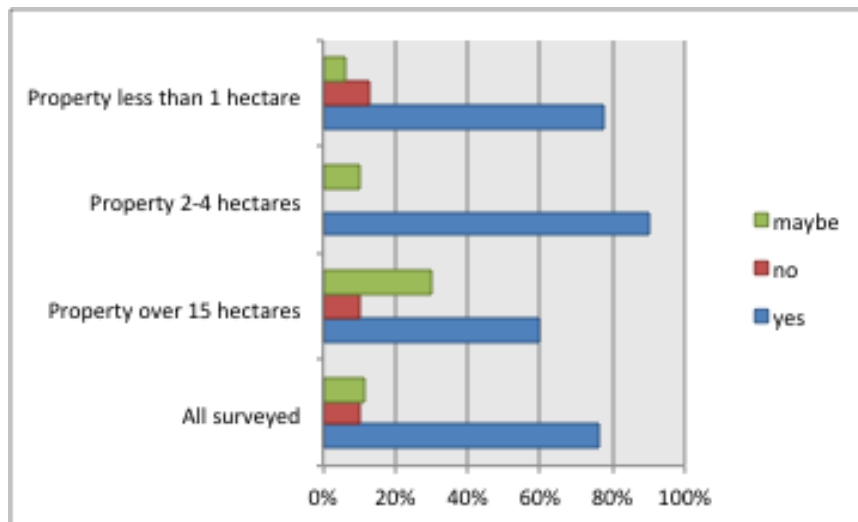


Figure 36: Support for local food initiatives in general

The graph in figure 36 demonstrates strong support for local food initiatives from all people surveyed (total of 76%). This reinforces earlier results that demonstrate most people believe it is important to know where they source their food. It shows a clear relationship between support for local food initiatives and people’s desire to know where their food comes from.

Interestingly, the small lifestyle properties were the most positive in their support with 90% saying they would support, only 10% saying maybe they would and no negative responses.

5.5. Assessment of the Local Food Landscape

The results show that non-commercial food production occurring across the foodshed area is extensive, with over three quarters of all households surveyed indicating they are growing some food items, and one third of those growing believing they are self-sufficient in one or more of those items. Furthermore, of those who indicated they are not currently growing food, over half indicated they are planning on doing so in the near future.

Additionally, the diversity of food grown within the project area is substantial and varies from protein rich foods such as lamb, beef, eggs and nuts to fresh produce such as fruit, berries and a wide range of vegetables. Vegetables are the most popular item to grow (ranging from just silverbeet and potatoes to a wide range of brassicas, roots and legumes) with almost all of the households that are currently growing food growing at least one vegetable. Fruit is the second most popular food to grow with two thirds of households doing so, then berries, followed by eggs. Nuts seemed to be a very hard food to successfully gain a harvest from with only a small percentage (from a larger group who have planted nut trees) achieving it.

A quarter of all the households growing food are currently supplying themselves and their immediate families with their own meat. The latter tends to be from the larger lifestyle properties due to the larger amount of available space for pasture. Reflecting on the amount of land being used for growing vegetables, we can surmise that more vegetable growing is occurring in the residential properties than in either of

the lifestyle property categories. The findings show that residential growers use three times the amount of space to grow vegetables than the larger lifestyle block owners. Interestingly, fewer households from these large lifestyle properties than from the residential properties are growing vegetables but they are growing significantly more meat than the other two property sized groups. A possible explanation for this is that both household types have limited time availability for growing, and that the priority for lifestyle block owners is farming animals rather than growing vegetables. Typically, lifestyle block owners derive income off-property, and pastoralism is a simple way to manage an extensive property.

Despite this effort to grow food, the research shows that that no household is self-sufficient in their dietary requirements. The majority of household diets are omnivore with only one in 12 people (8%) being vegetarian and one in 127 people (less than 1%) being vegan. A small percentage of households indicated they were self sufficient in one type of food, unsurprisingly for the properties over 15 hectares that tended to be in meat. Only a very small number of the smaller lifestyle properties indicated self-sufficiency in one food item (one household in meat and one in vegetables) with another two indicating they want to be in the future. Interestingly, residential households which indicated either self-sufficiency in vegetables or being close to self-sufficient in one or two items of food were so in eggs, all vegetables, most vegetables, or potatoes. One of the households also indicated that they had specifically changed their diet in order to be able to be as self-sufficient as possible, for example only eating meat when they hunted, fished or traded, eating fewer grains and only eating vegetables they grew, swapped or traded. This single person occupancy household is the closest example of self-sufficiency.

Considering less than one per cent of everyone surveyed is vegan, a key food group missing for the majority of residential and small lifestyle properties is protein. This is gained in large lifestyle properties due to three fifths of the households growing their own meat. Meat is significantly lacking for residential households and somewhat for small lifestyle properties, where only one third of households have their own meat. Grains and dairy are also lacking in these groups whilst eggs were more popular (one in twelve for residential and one in five for small lifestyle).

There is a clear trend of increasing protein self-sufficiency with greater property size, primarily due to the increased ability to manage livestock on larger parcels of land. Yet the smaller residential properties that lack the space to grow meat appear to be finding their own ways around the protein problem by keeping poultry and growing legumes. But more importantly, they are actively engaging with their communities and bartering, trading and swapping protein rich foods for something else. The diversity of food related exchanges that flavour Blueskin communities illustrate this well. Protein in the form of eggs is often grown and swapped between neighbours and friends, with meat being traded into the groups from external local sources (either hunted or home killed). Larger lifestyle households are currently well versed in this activity and use their protein products to trade and barter with friends and neighbours.

Chapter 6.

Community Perceptions and Beliefs about the Food System

6.1. Introduction

So far the research has focussed on capturing data to enable the evaluation of food production and consumption, and related transactional activities, within the Blueskin and Karitane foodshed. What are not yet evident are the community beliefs and perceptions about the status of the existing food system, where the strengths and weaknesses of the food system currently lie, and what opportunities there may be for change. In this section we explore community perceptions and beliefs about the existing food system in greater depth, and where opportunities exist for change.

6.2. Summarised Methodology for Capturing Community Perceptions

Primary data as well as secondary data have been collected for this project. With a combination of these two data sources, we have been able to open up the questions of 'what is local', and 'what constitutes the Blueskin and Karitane foodshed'? Both sets of data have both positives and negatives. Secondary data – the type of data we have used from census collection and Agribase datasets can allow a macro appraisal of phenomena. When seeking to answer specific questions we need greater detail however, and this involves use of such methods as interviews, surveys and direct observation and or participation. Such an approach is time consuming, but yields rich results. The answers derived from such methods are known collectively as 'primary data'. In *Appendix C: Full methodology for capturing community perceptions* we detail the methods used to collect primary data for this part of the research.

6.3. Perceptions of the Current Local Food System

Respondents were asked whether there is a local food system, how they perceived it to function, and how they participated in it. Responses were mixed when asked if there was a local food system, with many respondents indicating that they did not believe a local food system existed. One person said, "*No, I would only see it as a working food system if you could get eggs, potatoes, meat, dairy, veges, fruit – not grains...to a substantial amount of people. At the moment it is just a hobby.*" Another respondent said, "*It is more like individual family food systems*" and another said, "*Informal systems around growing food are pretty good, and we are good at sharing food – but an actual system for local food – I don't think there is one.*" The majority of people who responded to this question considered there to be a local food system within their community, but identified the systems as being informal. One respondent said, "*It's random, not cohesive. I suspect there are lots of people doing*

things that most of the rest of us don't know about." Comments such as "not organized or planned" and "not really a system as such, it just happens" were common.

Some respondents stated that the prevalence of local food in the community fluctuated markedly, moving with the needs of the community. For example, the rise and demise of the Waitati harvest celebration was considered to have "run its course because food growing has become normalised." Others discussed how very localised, inter-family scale systems were strong and functioned well due to the closeness of relationships and the high levels of trust that underlay them. Differences in opinion expressed during one focus group session provided contrary thought, speaking of more isolated groups within the broader community, saying, "Those who can afford to support local food can't get access to it, it is not available to them, and it should be."

The next section of the interviewing sought to explore people's motivations for being participants in their local food system. A variety of perspectives were expressed, commonly centred on opinions that local food provided a wide array of benefits to the individuals consuming the food, but also to their wider families and communities. Personal benefits cited included personal health benefits, as well as better tasting and more nutritious food. Some environmental benefits discussed included lower food miles and less input-intensive food systems.

One recurring theme in the interviews was a sense amongst respondents that their local food system was important for creating strong community relationships and social cohesion. Food security, and the potential for a community to be in control of their food and to support one another during "worst case scenarios" was also discussed. One person said, "It is a smart thing to do – to grow more food than we need, so as to share it, we can give to those in need..." A common view was that people who lived in these communities were lucky, even privileged, and as such had a responsibility to make the most of it, and to "share the rewards." One respondent commented, "We empower ourselves with more control over our lives. It's fun and you meet nice people. It feels more rounded and healthy and satisfying."

Another focus group had a slightly different outlook, firmly placing food security and local neighbourhood support as the motivator for their food initiatives. "We have a local buyers' club, which requires organisation, but is a way of supporting each other and of being able to source good quality food at reasonable prices. This is about feeling secure in our isolated community." Within the same community there were concerns expressed about the ageing population and the increasing sense of isolation from the core services in Dunedin. Accessibility to food for this group was a concern, primarily due to the limited public transport.

During the process of interviewing and facilitating focus groups there were frequent conversations about the Otago Farmers' Market, held in Dunedin once a week on a Saturday morning. For many people this appeared to be their reference point when considering local food systems. One person within the Purakaunui focus group stated, "The farmers' market is good because it has inspired change, and made people think about their food. It has started to break habits." Another person added, "Much of the farmers' market is about the aesthetic, and the pleasure of having

contact with the producer and knowing where food comes from, meeting other people, and seeing a reversal in the system.” Yet not everyone was enamoured with the Otago Farmers’ Market, as demonstrated by one comment, *“it is for the middle class, and simply a place to hang out. Anyway, it is too far from [our community] for us to be visiting.”* The distance of the Otago Farmers’ Market from Blueskin and Karitane settlements was reiterated on a number of occasions, reflecting a common lifestyle choice to not visit the city during the weekend.

In the next section of interviews producers who supplied local food to their community were asked what their motivations were for choosing to be a part of their local food system. A shared response was one of having greater pride in the food they produced, with a common appreciation from producers that their food is being consumed locally. The shortened supply chain and face-to-face transactions within their own community provided an instant feedback loop regarding quality and gratification. A small number of producers stated that there were economic drivers that motivated their participation in the local food system, i.e. *“allowing me to be self-employed”* and *“by taking out the distributors I can make more money.”*

6.4. Weaknesses and Barriers

The questions during interviews and focus groups enabled participants to explore what barriers were perceived as dissuading uptake or scaling-up of a local food system.

Those involved or connected to commercial or semi-commercial growing operations firmly considered the lack of current supply of local food to be the main barriers to a more scaled local food system. One comment was, *“People don’t want to grow food for sale – it is too hard, [growing is] too difficult to make money off.”*

The demand for local food was something that many people spoke of, reflecting a consistent community perspective that locally grown food is highly demanded, but that the supply is not sufficiently reliable. *“Labour is the missing factor. There is a huge amount of energy and skills needed to grow food, and people just don’t have that capacity or inclination anymore.”*

Some flagged the availability of quality land as an issue. One well-regarded grower said, *“The majority of our soils around here are quite poor”* and *“I can only look on and dream of the lovely flat fertile land being used for horse and cattle grazing.”* Others talked of a lack of inclination from landowners to use their land productively. One person in Waitati said, *“The land has lost production. It has been sold off into lifestyle blocks, and not many of them are growing. All the subdivision has changed the shape of the land.”*

Other people interviewed also suggested a lack of diversity of food was a significant weakness in the existing local food system. This lack of diversity was considered to be caused by three core and interrelated factors – people’s lack of knowledge and skills pertaining to growing, *“We have lost knowledge of what grows well here”*, people’s lack of available time to grow food, and a limited growing environment. Vegetable and fruit producers discussed at length the difficulty of growing a diverse range of food crops in Dunedin’s short growing season and the often-poor soils of the

area. The limited food-growing potential meant they were restricted in what they could offer their customers.

The lack of structure of the informal food system was described as a weakness by one respondent, saying *“for some producers, its organic, informal nature is limiting, in that it lacks structure and avoidance of regulation can cause anxiety for some, leading them to avoid participating fully (or at all) in something they feel otherwise inclined to support.”*

For most producers who had tried to develop a commercial or semi-commercial food operation within their community they had all struggled to create a sustainable livelihood from their venture. Demand for their food has traditionally been sporadic and non-committal, and this is considered to be due to a number of different reasons. However, primarily it was considered that local consumers required reliability and consistency of food and that the often incidental or sporadic supply of occasional foods did not meet their needs, and as such, was met with ad hoc patronage. Secondly, the cost of food was considered to be a primary motivator behind people's food-purchasing decisions.

When this issue was further explored there was a strong opinion expressed from producers that it was often the higher cost of local small-scale food production that dissuaded more support for local food. *“People go shopping in town and don't integrate the cost of getting there and back...”* said one grower. Reinforced by another grower who commented that, *“People expect local food to be cheaper, but given that it is usually small-scale production it is not. The whole mainstream food system relies on efficiencies of production and squeezing down the cost of food. It is cheap, but it is unsustainable.”* Another grower said, *“People do not value good food enough. We have become used to cheap, mediocre, low nutrition, low taste food”,* and *“people don't understand what it takes to produce high quality food in a truly sustainable manner.”*

Price and value of food is a topic of discussion and debate within the community. Those closely involved in food production repeatedly pointed to the inability of small-scale producers to make viable incomes off their enterprises, whilst many others in the community often mentioned the high price of food in New Zealand and the difficulty for some families to afford good food, and in association, the higher price of locally grown food. One respondent said, *“Local markets tend to be more expensive”,* and an interpretation that another respondent echoed: *“People that sell locally grown tend to exploit in terms of price.”*

Of interest was the consumer perspective on the availability of local food. Providing a contrasting perspective to that of the producers, the common opinion expressed by consumers was the inaccessibility of local food, and as stated by one person, *“A need to be in the know.”* Such comments reflected a strong tendency among consumers to state a preference for the notion of supporting local food and a sentiment of support should that food be accessible and available.

The related topic of people's food consumption habits was also further explored during the interviews. The role of supermarkets was often raised as a barrier to the enablement of stronger local food systems, due to the existing dominance of supermarkets and the ability of supermarkets to reliably supply all food needs from

one location, and at times that were convenient and accessible for all. One local producer said, *“Supermarkets have convenience and you know it is always there. Consumers – if they are serious (about local) – have to buy into something that is less convenient. They need to be more engaged than simply viewing the purchase of food as a transaction.”* Another person said, *“People’s attitudes and their habits of having everything here and now will need to change.”*

Meat producers talked at length about the difficulties they had in processing and selling meat at a small, local scale. Small-medium scale farmers saw an opportunity to supply their local communities with quality red meat, but identified regulatory barriers around the sale of red meat as being impenetrable and stopping this from occurring. *“There is no way to legally home kill meat and sell it on to the wider community”*, said one farmer, going on to say, *“We kill for close family, but can’t when thinking of a wider group.”* Another farmer added, *“When we first started there was an abattoir, we also had local butchers and now we have supermarket chains; all the butchers are gone.”* Other meat producers also talked of the same regulations, flagging them as an impediment to small-scale production and distribution, but offset this frustration with the comment, *“But we just trade with our neighbours anyway, and that works.”*

Larger-scale pastoral farmers were asked whether they saw the local food system as providing opportunities for them. The overall response to this question was unanimous in two respects. Firstly, farmers expressed real support for the idea of being able to supply their local community, *“Yes, it would be marvellous, local people enjoying the quality of our produce”*, and *“I know from previous feedback that people enjoy our meat, and that is always nice to know.”* Another comment from the same farming family acknowledged disappointing aspects of the farming system within which they operated, and saw localised food systems as providing greater transparency of farm practice. She said, *“I think there is a benefit – decentralisation and the accountability of farmers. It would change the bigger picture, so it is not okay to feed cattle palm kernel, and if a farmer does, then people won’t buy his meat.”* However, within the same conversation these same farmers expressed significant reservations about the viability and practicality of being able to supply into the local market. *“I don’t know how we would sell 1,600 lambs every year and we would have to change our whole management system to do so,”* said one farmer, going on to say, *“There would need to be significant economic benefit for us to change our system, much as I appreciate the social good.”* Another large-scale farmer said, *“It would be hard for us to fully utilise the carcass. Most people or restaurants will only want the best grades of meat, which will leave us with enormous amounts of the lower grade cuts.”* The lack of local facilities for processing meat is a significant barrier to local distribution, yet the role of the local abattoir and butcher is an important part of the process; once removed, further obstacles occur for the producer. The scale of these large pastoral farms was simply considered to be out of balance with the levels of community consumption, and also with the seasonal limitations of producing a high quality product year-round in the Dunedin climate.

Regulation pertaining to food safety was also flagged up by a number of other producers who were interested in selling processed food, and had identified regulatory challenges with regard to this.

6.5. Opportunities and Aspirations

When discussing what a potential future local food system might look like interviewees were asked a number of questions that sought to explore community aspirations for their food system, as well as understanding the barriers to those aspirations and what changes would need to occur to enable those aspirations to be achieved. The responses have been discussed from the perspective of consumers, producers and distributors.

Many backyard growers and lifestyle block owners interviewed expressed some aspiration for a change in their local food system, often talking of a desire to increase the scale of existing initiatives and systems. However, this opinion was not unanimous, with a number of backyard growers expressing satisfaction with their existing food system and the informality of it. One person said, *“What we have is at seedling stage, not very functional, half a step on from being neighbourly, it is incidental production. But it works, it is meeting existing needs, otherwise it would naturally change.”* Lifestyle block owners were clearly enthused by the idea of developing more structured methods of enabling local food transactions. Through the focus groups and interviews, it became apparent that the primary motivator for enabling these transactions was social occasion and a desire to be more connected with others in their community.

The success of community actions to establish food enterprises was discussed by a number of people from Waitati, but not in other settlements. *“WOO fund-raised at the harvest market, and we used that money to go towards the open orchard. Then any wasted fruit was used to make cider...intention was to create a community asset. All of these things have grown out of community action.”* The idea of expanding on this community action was commonly raised, with a primary focus on collective food growing (via allotments) and on developing community infrastructure to enable the processing of food.

Consistent amongst the three focus groups was a desire for mechanisms that enabled the more regular trade or exchange of food. A physical hub to act as the centre of food transactions was one suggestion raised by a number of people, whether as a part of an existing food trading outlet (such as the Karitane store), or a new structure specifically developed. Other common suggestions were the establishment of food cooperatives, developed to enable the efficient and effective sale and purchasing of food amongst a number of households. Of interest was that participants viewed these co-ops as providing cheap food from afar to complement the food that could be locally produced. In those settlements where food markets do not currently exist there was some support expressed for the development of a farmers' market, though there was also concern that the community was not large enough to credibly support such an idea.

Some respondents referred to the success of two local food enterprises, highlighting their viability and the reliable support they both obtained from local customers. Interviewing the owners of these businesses, it is apparent they both provide reliably available food that is of consistent quality in a place and physical structure that is accessible and open to all. Rather than being ad hoc support for these products, customers are loyal. Leveraging off the known success of one of these enterprises,

two respondents raised the idea of the development of a community owned farm that provided meat and dairy products to their community.

Yet many other people voiced concern about the idea of 'scaling up' and doing anything that was too ambitious. *"I have concerns about upscaling, about who is driving it, and why"*, said one person. Another said, *"I don't think the motivations of scaling up are always necessarily good, and can often result in a reduction of the values."* Finally, a third person stated, *"Incidental development leads to greater uptake than planned action which is trying to find a need where a need does not exist."*

6.6. Community Initiatives

The next stage of interviewing and focus groups sought to understand what initiatives would help to construct the aspiration and vision that people had discussed.

Numerous people discussed the need to inform, educate and raise community awareness of both how to grow food, and the benefits of high quality food. Increasing the education of food growing and cooking in schools was commonly cited by many respondents, so as to have *"kids growing up with an appreciation of where their food comes from."* Those participants in the focus groups enjoyed the concept of individual households sharing their surplus home grown food with their local schools. This concept was extended by some groups into developing food stalls at local schools, *"As a fund-raiser for the school, or maybe they use the donated food surpluses for cooking class lunches"*, as raised by the Purakaunui focus group.

The aspiration to educate people about growing food was not restricted to schoolchildren. One person said, *"We have lost a generation of growers – technology is good, but people have forgotten the basics."* Many Waitati residents discussed the previous success of the food harvest celebrations as being a successful mechanism for education. *"They connected people, raised awareness of what can be grown locally"*, said one person, and another said, *"Ultimately they stimulated people to grow and trade – which is what is happening now."* People who had been involved in the harvest celebrations considered that these had now run their course and that people were now involved in local food initiatives in other ways, primarily through growing and occasional trading. One research trend that was interesting was that people who had not had historic involvement with the harvest celebration, commonly the newer lifestyle block owners, were enthusiastic about the notion and considered it worthy of re-establishment.

The concept of a local food directory was raised as an idea by 'the lifestyle block' focus group as a method for connecting growers directly with local consumers. An individual within that focus group clearly stated its use, as a mechanism for communicating the availability of seasonal food, *"Particularly for those of us who are new in the area, and who don't have kids at the school – it is not so easy to know what is available locally."* Within the same discussion there was deliberation about the idea of a web-based, real-time system, providing constant updates of the availability of local food from participant growers, whether backyard or commercial growers.

Other suggestions were for larger-scale infrastructural initiatives, most commonly to aid the distribution of local food. *“A Mr Whippy type truck, picking up local food from along the coast, and concurrently sorting and delivering”*, suggested one person, and *“A co-op of farmers, selling consistent quality meat throughout the year”* from another. However the most common suggestion was for a fixed hub, or a space for distribution. The options for centralised distribution were numerous, from pre-ordered vegetable boxes deposited to a central location, to renting out baskets for growers to place their surplus for sale in a centrally located store, to a fully-managed food store which provides locally grown seasonal food and is complemented by importing food from outside the district. Some people considered it sensible to make use of existing food outlets in the area, *“Making use of existing infrastructure, like the Waitati store, or the supermarket in Port Chalmers – they are already trading in food, so best to tap into their systems.”* Central to the objective of these various initiatives was an aim of *“uniting growers”* to enable coordinated supply of food to local communities. *“We need to take lessons from the mainstream system – the systems, the structure”* was one suggestion.

Others raised doubts about the viability of such initiatives, pointing to a potential lack of critical mass for support of such initiatives due to the small populations of these scattered settlements. *“My feeling is that the cost of food is the main factor here...”* said one person, continuing, *“This community is small and not overly affluent. Food needs to be realistically priced above everything else.”*

The development of commercial kitchens was also considered to be a strong mechanism for expanding the prevalence of local food, and also as a catalyst for local economic development via value-added food. Other people discussed community investment in processing equipment, such as high quality olive oil presses, or roller mills for flattening grains. The lifestyle block focus group discussed this idea, suggesting *“...all these devices would be best owned by local people as their small business, they charge a fee for use, or buy the stuff to be processed.”*

Others raised the idea of community supported agricultural (CSA) mechanisms that did not rely on significant capital investment in infrastructure to enable distribution, but did provide a structured mechanism for consumers to support producers in a consistent manner. *“I am sure that there are enough vegetables grown here in surplus that the growers could collaborate and produce a reliable and diverse vege box scheme”* suggested one person, and, *“If a subscription-based meat scheme was available, I am sure it would be greeted with enthusiasm from the Waitati community”* said another. Some growers also supported such ideas, and the increased reliability they would provide. *“Growing for a certain market, to order, would be great! It will also reduce waste and is less fickle,”* said one grower, adding, *“A CSA where you know where it [the food] is going, and growers can confidently plan for the future would be ideal.”* Again, growers sought recognition of the ‘true value of food’ and saw direct selling mechanisms as providing opportunities to enable that to occur. *“I’d love for people to understand the real cost of cauliflower. If they knew more about my operations and what I did to grow that food, they would understand its value”*, summed up one grower.

6.7. Views from the Distributers and Retailers

Existing food distributers within the project area were asked for their opinions of the local food system in their area, how their businesses engaged with local food growers, and the future 'local food' opportunities these distributers could envisage. Within this 'distributers' category we conducted interviews with the managers or owners of supermarkets, convenience stores, pubs and cafés.

Only one of the interviewed distributers believed there was already a functioning local food system, with all others stating that it only existed in an informal, backyard capacity, or through local farmers' markets. Of the six distributers interviewed only one was currently committed to supporting local producers, as well as concurrently supporting organic producers. A second of the interviewed distributers sourced a high proportion of her raw food from the Otago Farmers' Market. The other four were incidental purchasers of local food, buying such products if the time and opportunity was appropriate at the time. *"People (growers) haven't approached us, we have approached them. If local growers asked us to supply their food it is likely we would say yes, we would want to support them,"* said one of the distributers, reflecting the perceived small scale of the existing local food system.

However, all of the six distributers interviewed during this research either currently stocked some local food in their business or had done so at some point in the recent past, and all of them expressed support for the notion of increasing local food initiatives. The respondents' justification for supporting local producers was driven by two primary principles – firstly, that it was inherently good to support local businesses; and secondly, that they believed their clientele would support local food through their purchasing decisions.

All respondents demonstrated an obvious sense of loyalty to local place and local community, and a desire to support others in their communities. One retailer commented, *"I think people want to promote growth from others in their community. Nearly everyone has pride in where they live and they want to see it growing, a lot of people around here are strong about that."* Economic development was reiterated as a key desire for a number of the distributers interviewed, with many people viewing the exchange of local food as being an enabler of local economic development via food culture tourism and celebration of place. One manager of a larger operation said, *"I can see food culture being a real part of the package over here, both in terms of engaging with our community but also by picking up the retail environment and linking with the tourist trade."* A different respondent said, *"We would love to move our business in that direction by being able to experiment a bit, with more of an underlying culture of exploring our local food."* Another retail food manager added to this discussion by saying, *"The vision goes with the chef, and without that, it would not work. Even if I was keen to promote and sell local, I would have to have our chef on board."*

There was agreement amongst a number of the respondents that their clientele would likely support local food that is sold through the retail environment. Asked whether their customers were concerned about local food, four of the six said they considered local food was not currently important to their customers, however they did consider their customers would support local food products if they were made

available and clearly marketed as being 'local food.' Such support was considered to be as much about experiencing local cuisine as it was supporting the local producers directly. Two of these respondents had a proviso that "*The price needed to be right*", and that "*Prices are already high, and we couldn't put people off with higher prices.*"

The importance of the price of food was evident again, as it had been with consumers and producers interviewed for this project. One food wholesaler said, "*The biggest barrier is the consumer not understanding the true cost of food*", and went on to say, "*The food bill used to be a third of the weekly expenditure, it has now shrunk and has been transferred to debt ... people will pay \$4.50 for a coffee, but won't pay \$4.50 for a cabbage.*" Another reinforced cost as being a primary driver for consumers and said that, "*We survey customers and price is number three [from the top]. People drive a long way for cheap.*" Lastly, those in the hospitality food sector shared an opinion that, "*Margins are tight all over the place so we can't afford to pay higher prices.*" However, one significant distributor said, "*We have a wide variety of customers and price is not an issue for some.*" He went on to say, "*I have the ability to sell some products at a lesser margin, and so can favour local producers by selling at less profit to me. My feeling is that it [sale of local food] would be supported by locals, and as such, I would definitely support it.*"

When exploring the barriers to having more local food in their commercial operations the respondents talked of a lack of availability of local food, reinforcing the findings of the consumer and producer interviews. "*I have tried to run this place on using locally sourced foods, but I just can't find the food in the volumes or the consistency that I need,*" said one retail food owner. "*I can't sell it if it is not available to go on the shelf,*" said another. Others spoke of the simplicity of their current systems and of their reluctance to change. One hospitality retailer said, "*We would have to change the menu to reflect seasonality. At the moment we have a very simple menu, we have a very little kitchen. Keeping the menu basic, we can handle it, and it works...*"

The consistency of freshness and taste quality was highlighted as a fundamental requirement of a viable system, as was the requirement to meet food safety regulations. One respondent considered that the requirements of food safety regulations were an impediment to their ability to support smaller producers due to the difficulty in some producers meeting those regulations. One interviewee used an example of local procurement of raw milk, "*It would make great coffee, but we aren't allowed to use it. I drink it at home, and it is beautiful...*" However, another respondent, when discussing the need to meet regulatory requirements, said, "*We can help them [producers] through the paper work, it is not that bad.*"

There were a diversity of views about the role of supermarkets and existing commercial wholesale distributors, with most retailers demonstrating strong support for the ability to obtain food year round, in a convenient and highly accessible and consistent manner. Others complained that the food quality was poor, and that not knowing the origin of food was a negative attribute of their current food supply. For local growers to effectively provide food to these distributors there was a consensus that it would need to occur in a similar manner to the system they already used. The idea of a co-operative of local growers was discussed by some interviewees as providing the structure necessary to deliver the mechanical attributes of food demanded by those in the retail and wholesale environments. "*A one-stop-shop, or a*

rep that goes out and deals with all of the retailers, something well organised,” said one person, and “A cooperative to achieve more scale, and a delivery system that works for everyone. One distribution system servicing 10 growers and multiple retailers...” said another. The importance of a reliable food delivery system was summarised by one retailer, “If I can’t get it from them whenever I want it, then my customers are let down and my business will fail.”

Chapter 7.

Local Food: Community Examples

7.1. Introduction

As we discovered in Chapter 5 Blueskin and Karitane residents' food supply primarily comes from supermarkets outside the foodshed studied in this report. Nevertheless, there are a number of small local food enterprises and initiatives both within the Blueskin and Karitane foodshed and on the periphery of the larger centres outside the foodshed that supplement local production. These enterprises are important to many local residents and, additionally, people involved in these enterprises provided expert knowledge and inspiration for this project. We explore them in more detail here.

7.2. Dairy Farm and Hub

Alex and Merrell own a small 'town supply' dairy farm, just outside the Blueskin area. It is a successful food hub supplying not only unpasteurised milk, cream and yogurt but on occasions cheese, mango lassi, maple syrup, bread, free range eggs, flowers and other surplus from their own garden. In 2012, with community advanced financing they doubled their herd and used community support to improve paddocks



Photo: Local Dairy Farm

by asking their customers to invest in a specific project on their farm in order for them to shoulder the cost of cutting back the gorse and cultivating and seeding for feed for their stock.

During the course of the next 12-18 months customers would recoup the outlay through continuing to purchase produce from Alex and Merrell. The scheme worked and allowed the farm to expand production and provide more feed for the dairy herd.

7.3. Habitate - Edible Habitats

Getting people involved in the design of their gardens gives Jason Ross a kick. His company, Habitate, offers a wide variety of services, including edible landscape design. Jason helps by designing the layout, providing advice and recommending plants especially suited to each property as well as helping with construction and planting the edible gardens.



Photo: Jason Ross (courtesy of www.habitate.co.nz)

Jason has designed edible gardens for urban and rural settings, community gardens, and schools. He's been part of establishing a large cultivar preservation orchard with the Tree Crops Association and with WOO (Waitati Open Orchards) and has planted 65 heritage apple trees in his community to “*fill the streets with food.*”

Fruit trees are his specialty, especially heritage apples and pears. Habitate heritage fruits nursery provides a diverse range of disease-resistant and outstanding heritage fruit trees, berry fruits and companion plants that are diverse in both flavour and use. Jason has also discovered little known edibles to grow, such as miner's lettuce and Chilean guavas.

Jason's goal is to help people enjoy the satisfaction of growing healthy and abundant food at home. He believes that growing some of our own food at home also contributes to a smart sustainable future by reducing energy used, pollution created and land used for food production; while also saving on food bills.

7.4. Sue and Andy Barratt Organic Fruit and Vegetables



Photos: Certified Organic / Andy & Sue (courtesy of www.tastenature.co.nz)

Sue and Andy have converted their 17 hectare block into a certified organic small farm. They have planted trees for timber, shelter and firewood and grow garlic, apples, hazelnuts, berries and a variety of other fruit and vegetables. Sue remembers that they didn't necessarily start out to be organic growers but they started planting their own food and wanted to do it the right way. Soil health is paramount for Sue and Andy. Over the years they have worked along the lines of permaculture, trying to ensure that everything on the farm fits in with everything else. For example, the two donkeys, named Gorky and Mac, provide manure for the compost.

Sue and Andy have developed their farm with a lot of thought and freedom to develop it over time. They have taken the time to trial things on a small scale before moving to the next step. They belong to the Tree Crops Association and look after heritage fruit trees at the association's apple cultivar preservation orchard. They also belong to Otago Organics and help others learn about growing food, as well as all learning together, by finding what foods grow well locally and capturing local knowledge.

7.5. Hill Rd Hazelnuts



Two hundred productive hazelnut trees are the result of 12 years of good planning and hard work by Neville and Coleen Hastie on their Warrington property of half a hectare.

They were always keen home vegetable and flower gardeners but wanted to grow a crop on a larger scale. After a lot of good research they decided on hazelnuts, a crop well suited

for this climate. By growing mostly the White Heart variety with three additional varieties as pollinators they have planned for overlapping pollination periods. Hazelnut trees are wind pollinated so Italian alders provide just the right shelterbelt, allowing sufficient wind to come through to spread the pollen. The time for harvest is late May. They are enjoying using their new vacuum harvester after years of *“harvesting on our hands and knees, recruiting the grandkids and using all kinds of contraptions!”* The vacuum harvester picks up the nuts and leaves and separates them out as it goes. About 20% of the nuts harvested still have husks attached that need to be removed by hand. The nuts are then washed and hung in onion bags in lots of 2.5kg to dry. When the moisture content drops to 8% they are ready to crack and eat. They are tasty, nutritious and high in energy and an excellent source of protein, fibre and carbohydrates as well as vitamin e and minerals including copper, manganese, calcium, iron, potassium, zinc and selenium. Trials have indicated that the nuts keep well up to two years in the shell, however the bulk are sold each season and are ‘cracked to order’ to ensure maximum freshness. Neville and Coleen are regular stall holders at the Blueskin Market.

7.6. Carey's Bay Hotel



Photo: Carey's Bay Hotel, Port Chalmers (courtesy www.careysbayhotel.co.nz)

The Carey's Bay historic hotel and seafood restaurant is found on the hillside just around the corner from Port Chalmers. The Carey's Bay Hotel is a busy local pub frequented by residents in the Blueskin and Karitane foodshed study.

The seafood restaurant offers traditional pub fare such as beer-battered fish and chips, seafood chowder, steak and eggs and a classic fish pie. They offer fresh local fish, not directly off the wharf but from Harbour Fish and Southern Clams (both local businesses). They are doing their best to support local food, offering Emersons, Speights and McDuffs beer; wine from Central Otago small producers (such as Maori Point, Carrick, Aurum and Drumsara); they buy coffee from the local Port Chalmers roaster and local vegetables and eggs when they are available. They serve Evansdale cheese and, when in season, whitebait (bought from locals) and Bluff oysters.

7.7. Lawson Family Farm



Photo of Rob (left), Jim (centre) and Willy (right) (courtesy of Diane Bishop/ Southland Times)

Rob Lawson works on the family farm, 'Moana' with his father, Jim, and brother, Willy. Moana Farm, which has been in the Lawson family since 1950, is situated in the Waikouaiti Hill country and comprises four different land types, from intensive flats to improved hill paddocks, rolling hill and native hill country.

Sheep currently make up 70% of the 10,000 stock units farmed at Moana, while cattle make up 30%. The Lawsons farm 250 Angus-Hereford cross-breeding cows and most of their progeny are finished at 18 months, while about 50 lighter cattle are carried over a second winter. Their main focus is lamb production of which they are currently producing 7,000 per year. One of their main farming goals is to produce 10,000 weaned lambs a year within the next four years.

There is no irrigation on the property. However, a reticulated water system is operated on the intensive flats while on the hill country stock have access to natural water via rivers, creeks and ponds. The Lawsons have a number of QEII covenants on the property. They also take care to look after the Southern branch of the Waikouaiti River, which winds through the farm.

The Lawsons are undertaking several projects on their property which include looking at the effect herbs and clover have on lamb finishing and if a dose of smart shot (B12) will increase lamb growth rates. They also want to find out what effect iodine supplementation has on ewe conception rates and if cattle treated with BVD vaccine have higher growth rates than those left untreated.

7.8. Karitane Food Share System

A number of Karitane residents have long had an interest in local food systems and their potential to enhance local food security and the development of livelihoods.

Buoyed by the presence of a number of food growers in their area, a strong culture of sharing food, and an awareness of rising food prices and an increasing difficulty for some residents in accessing good food, in 2011 a core group initially came together to scope out and develop a food sharing and food sourcing system.

This informal group has had various iterations of systems, all centred around a general principle of 'keeping it simple.' This means streamlined communications, easy logistics, a combination of agreements and flexibility. Processes have included shared spaces for food drops, shared pick-ups of food sourced directly from producers, and shared sourcing of bulk foods from afar.

7.9. WEGgies



The Waitati Edible Gardeners group (nicknamed "the WEGgies") is a group established in 2006, as detailed in Chapter 2 to work on building food sovereignty.

"We want to confront the emerging challenges of post peak oil by strengthening our community in the immediate future with an emphasis on food

production. As energy availability contracts and global storming/warming pressures become more acute, we aim to establish greater local food production and a local food web” (WEGgies, 2006¹¹).

7.10. WOO



Photo courtesy of WOO

The Waitati Open Orchards (WOO) is a ‘growing branch’ of the WEGgies. Kicked off in 2009, WOO’s aim is to grow a diverse range of fruit and nuts in Waitati public spaces, for all to harvest. WOO volunteers have planted on street verges and Orokonui Riverside road reserve. Workshops and neighbourhood pruning sessions centred on WOO plantings help build skills and connections within the community. WOO’s focus is on fruit and nut trees because they are long lived, productive and robust food

plants suited to public plantings. Since 2010 they have planted and maintained 60 fruit trees along road reserves and verges throughout Waitati.

One further ‘productive bud’ growing out of WOO work to promote fruit and nut growing in public spaces has been development of an apple press by WOO member Paul Cardno. The press, known as the WOO press, has been introduced to take advantage of the fruit harvest potential.

7.11. Waitati Community Garden



Photo from Waitati community garden

The Waitati Community garden was established around 2008 when local landowners provided members of WEGgies with a plot of land just off Mt Cargill Road. Run as a loose cooperative arrangement, there is a focus on growing bulk crops, such as potatoes, garlic, pumpkins or beans. Anyone can join but approximately eight families primarily manage it.

¹¹ WEGgies vision, as stated at: <http://www.transitiontowns.org.nz/node/1333>

7.12. Warrington Community Garden



Photo from Warrington Community Garden

People from more than 10 households in Warrington have been involved in establishing the community garden, contributing plants and tending the garden during the past two seasons.

The growing area is expanding, particularly for potatoes and yams. The berry garden is slowly being expanded with gooseberries, red currants and blueberries planted.

The neighbouring horse provides great compost (despite sometimes getting into the garden and causing havoc!) and the garden

has a real community focus. Produce is distributed among participating families and to other Warrington residents.

7.13. Blueskin Community Market



Photo from Blueskin Community Market Facebook page

Seacliff was formerly the home of a monthly community market, while Waitati was the home of the four monthly WEGgies-organised harvest market. The latter ended and the former moved to Warrington School and was re-named the Blueskin community market. In 2014 the Blueskin market moved into Waitati and incorporated many of the stalls from the WEGgies harvest market. Described as the “*heart of the community and brings a wonderful sense of community to our village*” (Chris Skellett¹²), the market is not specifically focused on food as it caters for a wide range of goods including craft, flowers, vintage, books, etc.

Stalls are free (based on koha) however, if selling food, all stall holders are referred to the DCC to gain a permit in order to legally sell food produce at the market.

¹² From the Blueskin Community Market Facebook page

7.14. Buyers Coops And Free-Range Eggs



There are many unofficial buyers' coops or consumer groups of friends and neighbours who have organised themselves to collectively purchase items which are a bit more difficult to access, such as local milk. Additionally, there are many home cheese makers and a wide range of free-range egg stalls. As these stalls, co-ops, consumer groups and small networks operate within the informal economy, we simply wish to acknowledge their

importance here.

Chapter 8.

A Framework for Community Action

8.1. Introduction

We asked community members the open question, “*What should a local food system aim to achieve?*” It is clear that the expectations of community members are as diverse and wide-ranging as are the personalities of the people themselves. The diversity of perspectives means that a modified local food system, if possible to develop, is likely to emerge via a heterogeneity of approaches rather than a single option approach. The diverse range of food system stakeholders represent different scales of activity, from micro to national, and economic opportunities play out across these scales. The cultural, social and environmental benefits of a local food system are clearly as important as any potential economic benefits.

The people of the communities of Blueskin and Karitane who are leading the way in how people connect with food inspire this ‘framework for action’. This ‘framework for action’ is also grounded in the analysis of how the existing food system operates, how people engage with the existing system, and the structure of the various distinct settlements within the foodshed area. Whereas some participants in the community believe that the local food system currently in place is operating at a realistic and satisfactory level, others believe there is significant scope, and indeed need, for improvement to the food system.

In engaging with members of the community it has become apparent that if a functioning local food system is to deliver positive impacts to the various groups within the community there are a number of key attributes it would need to possess. A clear theme running through the majority of responses, however, is that a local food system should make *locally grown food accessible and affordable to local communities* across Blueskin and the Karitane. Simply stated, this theme has people and the environment at its heart.

If there is to be a change in the scale of local food systems in settlements across the Blueskin and Karitane area there are two systemic shifts that will need to occur to ensure any change can be sustained and made durable. The first systemic shift is fundamentally value-driven and recognises the need for the broader community to re-evaluate the importance of food to their health, their culture and to the social wellbeing of their communities. The second systemic shift is more structural in its intent, in that it needs to enable a range of physical changes so as to embed the value changes. These system changes are inherently intertwined and are part of the same system, but separating them into two strands provides the basis for a framework of change.

8.2. Local Food System Vision and Principles

Many enterprise ideas were generated from the initial consultation that has been discussed and analysed in the report so far. To distil these enterprise ideas into a

manageable number, and to achieve the vision of making locally grown food accessible and affordable to local settlements across Blueskin we have developed a set of principles that aim to encapsulate community opinion as to what constitutes a successful local food system.

The vision and principles are inspired by the people who live within the Blueskin and Karitane foodshed area, and who have contributed to this research either directly or through their enthusiasm, time and commitment to their own initiatives within their communities. The research to date has defined the vision and the principles set out below.

Vision: To make locally grown food accessible and affordable to local communities across Blueskin and Karitane.

To achieve this vision, food system initiatives will be guided by the following **principles:**

- **Celebrate** the joy and culture of food, the cohesion of community, and the sharing of nutritious, sustaining resources.
- Continue to **connect community** and **build knowledge** through the **celebration** of growing, harvesting and consuming food.
- Provide a **supportive environment for local growers**, including a fair living wage and job opportunities, and increase the opportunities for development of local food enterprises of diverse scales.
- **Enhance supply and distribution systems**, so as to better meet the needs of local communities now and into the future, providing resilience against future impacts.
- Provide **affordable access** to quality and nutritious local food for all community members.
- Increase the **diversity of food production**, matched to local needs, and produced in a sustainable manner.
- Increase awareness of **food provenance, seasonality and availability**, connecting food consumers with the producers and the landscape from which it is produced.

The vision and principles outlined above were used to guide the development of a series of enterprise descriptions, which were then used as the basis of further dialogue with individuals and groups across the project area. These enterprises, which are described in the next chapter of this report, aim to catalyse both thinking and action so as to build on the strong accomplishments that have occurred already.

Chapter 9.

Enterprises and Initiatives

9.1. Introduction

This section of the Food System Assessment seeks to transfer the vision and principles, described in the previous chapter, into practical and achievable actions via specific enterprise concepts. These enterprise ideas have been seeded from interviews, forums and survey responses and developed in partnership with residents.

This range of enterprises reflects the community's diversity of scales and ambition for change to the existing food system. Three community meetings were held in three different Blueskin and Karitane settlements in September 2014 at which the first cut of ideas were reviewed and responded to by the participants. Those responses were used to refine the enterprises, and to identify which enterprises had obvious community support. Community dialogue about the enterprises has intentionally been based on action outcomes with the hope that this work will assist community-led action.


9.2. Enterprise One: School Fund-Raiser Surplus Stall

9.2.1. Community Vision

"A school fund raiser - run by the school, like a stall where you drop off excess veges and pick up what you need - don't want to compete with Roger but provide a place for others to leave there surplus food." This concept is based around fund-raising for the local school and is owned and organised by each of the participating local schools. For example, in Purakaunui a stall would be located outside the school on Mihiwaka Station Road. This stall provides a place for members of the community to donate their surplus produce. Consumers wanting the produce can purchase produce at the stall via an honesty box. Any funds raised go to the school for them to use at their discretion. The aim of this stall is not to compete with Roger Bloc's weekend stall but complement him by providing locally grown produce or firewood (or anything else that local people would like to donate to the school for them to sell). This concept can connect to the curriculum in a wide variety of ways, through technology (building the stall) to science (understanding more about food and growing climates) and social science (why is some food more popular than others, what is the local culture of food, etc.) as well as potentially linking into EnviroSchools and becoming more of a hub for the community. The concept encourages young people to understand and appreciate where our food comes from.

9.2.2. How Would This Function?

HOW WOULD IT WORK?



1. A stall set up at each of the local schools to take surplus from the community.
2. Kids collect it in and package it up to sell.
3. Goes back out onto stall ready to be sold. Sold via honesty box, all money goes to school.
4. Stall would need two parts: incoming (collection point for surplus) and outgoing (stall/shelves for selling produce with money box for collection).
5. Could work with vegetables, fruit, added-value produce (preserves, etc.) or eggs.
6. Alternatively producers leaving produce/goods at the stall have 'pre-packed' them into sellable quantities.

It is most beneficial if the school incorporates the project into the curriculum, for example:

- Technology – building the stall;
- Learning languages – labelling food in Māori and English on the stall;
- Mathematics and statistics – running a small stall (collecting in donated produce and packaging up for sale, pricing and collecting money in);
- Science – understanding more about growing food, e.g. how weather affects food, seasonality of food, which food grows in abundance in our part of the world and why (the different types of produce donated to the stall); understanding more about healthy food, e.g. the difference between processed food, fresh food, organic and spray-free food;
- Social science – understanding more about the culture of food, e.g. which produce is the most popular and why; the benefits of local produce over imported produce, food grown in different countries around the world and how they cook and eat their food in comparison to what we grow and how we eat;
- EnviroSchool – linking up the garden to the stall (maybe selling excess produce from the garden at the stall), learning about environmentally-friendly packaging, etc.

9.2.3. Who Would Need to be Involved?

1. Primarily the school and the students – potential to build it into curriculum;



- Children would take responsibility for the stall, specifically for collecting the donated produce and packaging it up to be sold;
- They would be responsible for collecting the funds and labelling produce;
- Students would need to build a stall.

9.2.4. Any Issues Around Management of it?

- Relies mainly on community spirit and trust because produce would be sold when students are not there to manage it – i.e. when they are in school or after school;
- Relies on the school wanting to participate and take ownership – won't fly unless they do;
- Dependent on passionate volunteers, and may suffer from lack of structural support – schools must concentrate on the core curriculum and may face difficulty providing staff or resources to maintain this service over time;
- There is a significant limitation due to the mismatch of the school's term time with the seasonality of produce.

9.2.5. Any Legal/ Safety / Food Safety Issues?

This enterprise has the potential to bring adults not associated with the school or playcentre onto school grounds on a regular basis. There could be some issues with this for the school.

There are food regulations around transactions involving fresh produce (between school and families as families give koha for fresh produce). However, it is a relatively simple issue and the Dunedin City Council Environmental Health officers are available to help.

9.2.6. What Exists Now Near The Local Schools?

WHAT EXISTS NOW?

The collage features several elements:

- Waitati - Village Potager:** A photograph of a lush garden with various plants and a wooden path.
- Purakaunui Weekend Local Food Stall:** A photograph of a stall with a ladder and a table, set up outdoors.
- Waitati - Habitate:** A photograph of a woven basket filled with fresh fruits and vegetables, including apples, lemons, and green beans.
- Cartoon:** A drawing of five children standing together, engaged in conversation.
- Other projects and stalls:** A text box containing the following information:
 - Flaggswamp School has a seasonal stall
 - No stall in Waikouaiti or Karitane anymore (but there used to be)
 - Sue used to put food out on the Harvey Street Stall in Waitati

9.2.7. What Infrastructure / Resources Are Required To Enable?

9.2.7.1. Infrastructure

A small stall with the following requirements:



- Capacity to receive produce/goods securely, so they can be dropped off somewhere different to where they are picked up;
- A space for displaying produce/goods/prices without produce/goods being in full sun or destroyed by rain;
- A way of collecting money – so money can go in but not come out unless taken out by the students/teachers;
- A way for customers to leave IOU's.

9.2.7.2. Resources



- The school will need a way of packaging produce (learning about environmentally friendly packaging initiatives), or alternatively producers leaving produce/goods at the stall 'pre-packed' into sellable quantities;
- Most beneficial if the school incorporates the project into the curriculum.

9.2.8. Who Would Be Responsible?



- The school would need to commit to development and management;
- The community or parents would need to manage it over the summer months;
- The community and parents would need to provide the produce to sell.

9.2.9. What Is The Pathway To Get There?



9.2.10. General Feasibility?

Feasibility rests on the willingness of the school to commit time and resources to the stall.

9.2.11. SWOT

Strengths	Weaknesses
<ul style="list-style-type: none"> • Fund raiser for the school – has the potential to earn \$3,000 - \$4,000 per year (if 10 pieces of produce is sold at \$2 each – based on 193 whole days) • Teaching kids about growing and selling food, building a stall and running a stall • Uses all of the locally grown produce that could otherwise go to waste • Local food being directly distributed to consumers • Local people who regularly come to the school don't have to travel far to pick up fresh fruit and vegetables • Old food could go into school compost (so no waste) 	<ul style="list-style-type: none"> • Depends on the commitment of resources and time from the school • Potential for the same vegs/fruit being provided by all contributors (because everyone has surplus of same fruit and vegs at the same time) • Potential for no one to contribute to the stall • Potential for no one to purchase produce (examples of failed enterprises) • Stall is only operational during school term, so is not reliable for consumers • Harvest is over Xmas when kids are not around • Customers don't know who grew the vegetables and fruit or how
Opportunities	Threats
<ul style="list-style-type: none"> • To connect the experiences gained from the stall with the school curriculum • To offer fresh local food to local people, especially families with kids • In the unlikely event of produce or money being stolen the opportunity arises to teach kids the difference between 'have and have-nots', why would someone steal, what does it feel like to be the one stolen from • Potential for children to manage the stall out of term time 	<ul style="list-style-type: none"> • It competes with someone else's stall • Produce or money gets stolen • Dishonesty • People could dump old food on school

9.2.12. Connecting To Other Initiatives?

This concept would easily tie into the harvest party (concept two). Produce is collected at the school in time for the harvest party. The school is not necessarily the organiser of the party, just the local collection point.

9.3. Enterprise Two: Community Harvest/Wild Food Celebration

9.3.1. Community Vision

“Seems that a lot of green vegetable and fruit (apples) all come into season in the area at the same time.” “It is a celebration of food.” This concept is based around the idea of celebrating the bounty and working together as a community to harvest and process the bounty, whatever it is, be it apples into cider, potatoes to store or

greens to share and eat. Might need access to a base kitchen where foodstuff can be prepared in safe kitchen and so if surplus it can be made available to the public. Other similar ideas included to *“hold an annual cider and wild food event.”*

9.3.2. How Would This Function?

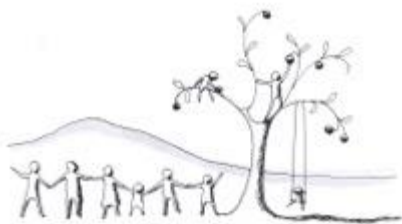
HOW WOULD IT WORK?

Community organizes their own celebration around the harvesting of specific fruit or vegetable depending on the time of year, for example:



- April - apple harvesting / cider making
- June/July - silver beet harvesting
- September - milk production / cheese making
- October/November - broad bean harvesting / broad bean dip making

9.3.3. Who Would Need to be Involved?



- Anyone who collects and has surplus wild food;
- Anyone who has surplus home-grown food;
- Anyone who has skills in turning surplus food into a value added produce (such as the WOO apple press and people who know how to make cider, preserves, cheese, dips, etc.)

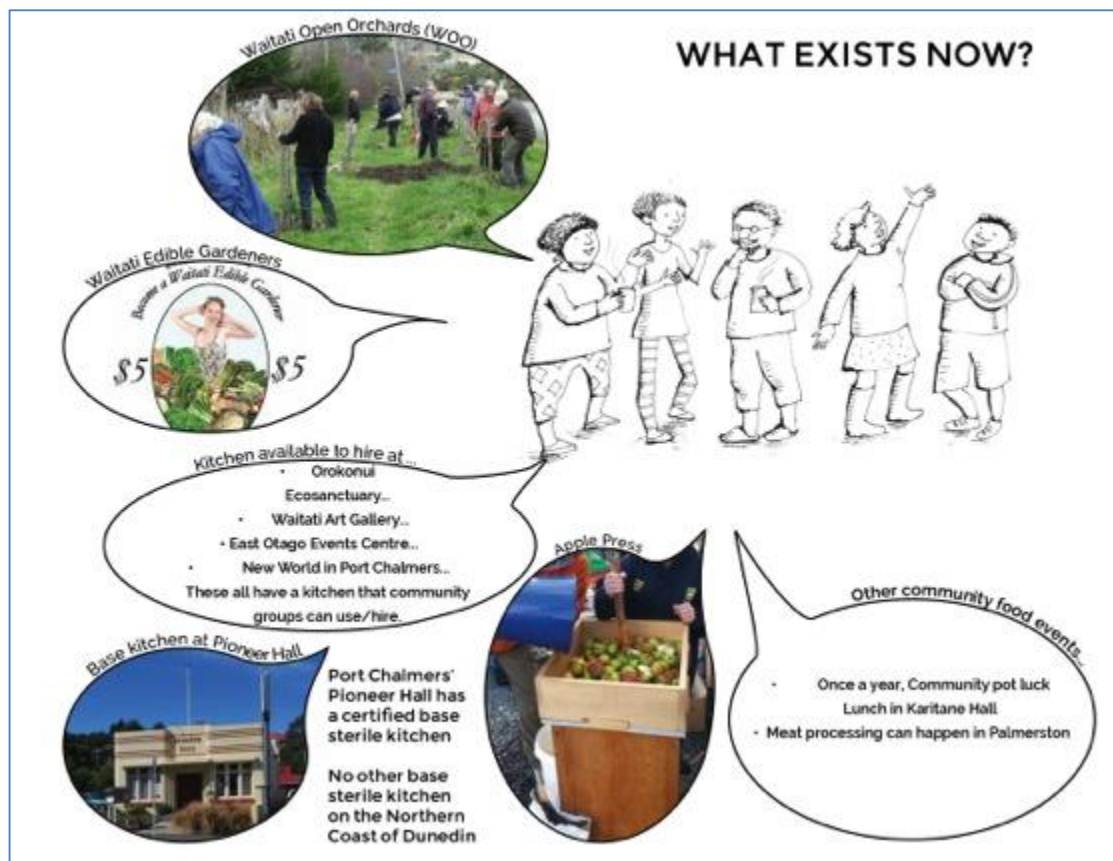
9.3.4. Any Issues Around Management of it?

It will require a committed volunteer group or individuals to turn this from an idea into action and to subsequently manage this.

9.3.5. Any Legal/ Safety/ Food Safety Issues?

Due to this enterprise emphasising community sharing, the idea is that food is given away free of charge. Therefore any food (processed or fresh produce) can be given away without any food regulations being required.

9.3.6. What Exists Now?



9.3.7. What Infrastructure / Resources Are Required To Enable?

9.3.7.1. Infrastructure

- The WOO apple press;
- BRCT Spit Roaster;
- Community halls or communal spaces.

9.3.7.2. Resources

- Organising;
- Advertising in community newsletters.

9.3.7.3. Anything else

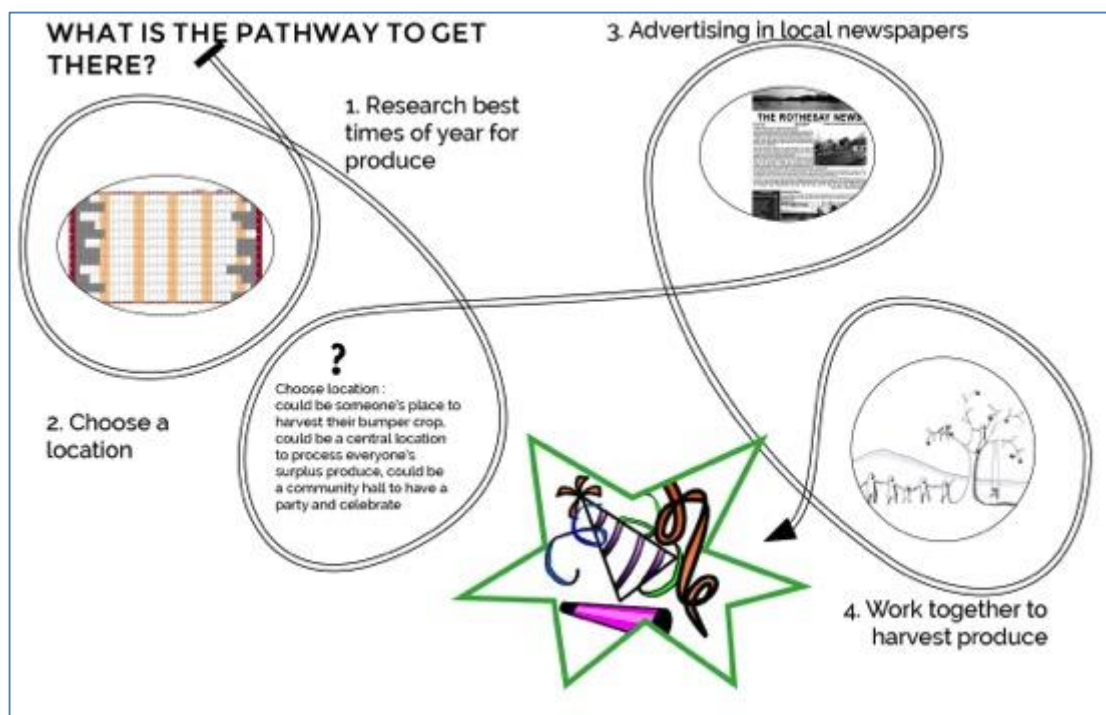
- Could be growing together as well as harvesting together as well as processing together;
- Could be collecting wild food together;
- Need to have working bees to maintain the trees planted in Waitati by WOO.

9.3.8. Who Would Be Responsible?



A willing volunteer group, or individuals, or existing organisation as appropriate within each applicable community would be responsible for organising and managing.

9.3.9. What Is The Pathway To Get There?



9.3.10. General Feasibility?

Easy to achieve, but requires significant commitment and energy from people.

9.3.11. SWOT

Strengths	Weaknesses
<ul style="list-style-type: none"> • Uses all of the locally grown produce that could otherwise go to waste • In some communities someone may already be organising this 	<ul style="list-style-type: none"> • Someone has to take responsibility to research and then organise the harvest party • Harvesting of apples for example, is spread over a long period - so there is not a specific "day" to harvest everything • Might not have the supply of produce to do this (lack of surplus) • No one wants to share their produce or work together • No one wants to organise the harvest party • Not enough produce grown
Opportunities	Threats
<ul style="list-style-type: none"> • A great way to build community 	<ul style="list-style-type: none"> • No one wants to share their produce or work together • No one wants to organise the harvest party • Not enough produce grown

9.3.12. Connecting To Other Initiatives?

This concept would easily tie into the school fund-raiser (concept one) as the school stall could be the collection point for produce at a particular time of year. It could also connect to the local food directory (concept three).

9.4. Enterprise Three: Local Food Directory

9.4.1. Community Vision


“There isn’t a local food directory currently around here – we don’t know what is being grown, especially because we don’t have kids in the local school (this is the source of all the good local food information).”

Aim: The directory that profiles local produce could *“highlight who is good at growing specific things, carrots, green, etc. Some people are better at growing one particular produce than someone else, plus they may have better soil for growing one vegetable over another. It is about awareness of who is doing what and connecting them up.”*

Methods of circulating: *“Methods of circulating the directory could be through the Blueskin News or a technology-based thing, technology could be used to our best advantage.”*

9.4.2. How Would This Function?

HOW WOULD IT WORK?



1. A committed volunteer would pull research together in the local area to identify all the people who are growing and willing to sell at the gate
2. Important to capture details of local backyard producers who want to share/sell surplus
3. Create a network of people who are growing produce
4. Could also link into the hub concept

9.4.3. Who Would Need to be Involved?



- People who grow or sell local food;
- Volunteers willing to compile information.

9.4.4. Any Issues Around Management of it?

Management of researching local producers could be a significant task; ordering, categorising, and publishing the information and maintaining it up to date will require resource and commitment.

9.4.5. Any Legal/ Safety / Food Safety Issues?

In terms of fruit and vegetables, a farmer/person can sell their own (self-grown) produce from their gate directly to the final consumer (i.e. anyone) without having to be registered with the DCC.

More complex food such as dairy needs to be handled a lot more carefully. Dairy is possible to sell “at the gate” but complicated regulations are in place to ensure fresh food sold this way is safe. Contact the DCC’s Environmental Health team for more details.

9.4.6. What Exists Now?



9.4.7. What Infrastructure/Resources Are Required To Enable?

9.4.7.1. Infrastructure

- A space/location for person/team to work – could be home-based.

9.4.7.2. Resources

- Someone with the skills to collate the information into a directory;
- Funds to print a hard copy;

- Funds to add information to the local food website or build a new one specifically for Blueskin;
- Resources to keep the database up to date.

9.4.7.3. Any other info

- Information can be shared through Facebook;
- Could be about sharing energy, connecting people to each other;
- Could be a way to link people in order to do micro-financing;
- Make use of Land Access database in order to give people who want to grow the land on which to do it.

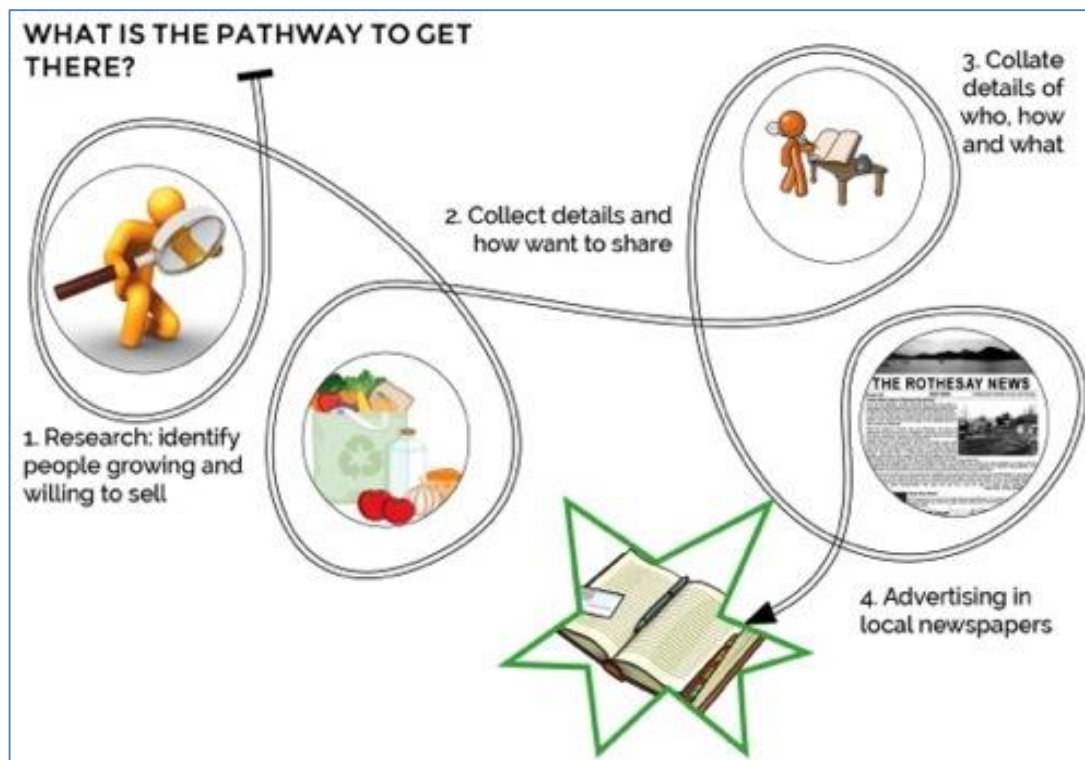


9.4.8. Who Would Be Responsible?

An organisation or individual with the funds and capacity to commit to this work. Our Food Network Dunedin is an example of a group who could potentially drive such an initiative.



9.4.9. What Is The Pathway To Get There?



9.4.10. General Feasibility?

Easy to achieve, if an organisation will commit funds, time and resources to making it happen.

9.4.11. SWOT

Strengths		Weaknesses	
<ul style="list-style-type: none"> • Creating a way to access locally grown food • Uses all of the locally grown produce that could otherwise go to waste • Local food being directly distributed to consumers • Low cost to start up • No middle-man • Connects growers with consumers, developing relationships and providing feedback to growers 		<ul style="list-style-type: none"> • Volunteer has to take responsibility to research and then organise into a directory, or funds raised to employ worker • Directory would need distributing • Directory would need updating • Less of a social enabler than a stationary hub • There may not be the supply to meet the demand 	
Opportunities		Threats	
<ul style="list-style-type: none"> • Offering fresh local food to local people • Returns to small growers • Potential stimulator of new enterprises 		<ul style="list-style-type: none"> • No uptake and no one wants to participate in a local food directory • Consumers don't want to drive around to a whole array of sites to pick up their groceries • Won't obtain the necessary demand due to the uncoordinated and incidental nature of supply 	

9.4.12. Connecting To Other Initiatives?

This concept would link in with Concept 1: School fund-raiser, Concept 2: The harvest party, Concept 4: The local food hub and Concept 6: The local food delivery service. Some local growers may choose to participate in the hub concept rather than have local people turning up at their gate.

9.5. Enterprise Four: Local Food Hub

9.5.1. Community Vision

“A place where we can trade goods, support small-scale producers and make use of the excess food we produce in our backyards.”

9.5.2. How Would This Function?

HOW WOULD IT WORK?

The base model food hub concept is based on both producers and consumers having access to a central and secure site to allow for the distribution of food goods.

The site is unstaffed, and relies on volunteer commitment (or a small amount of paid labour) to ensure it is kept clean and tidy, and is fit for purpose. Producers drop food off at pre-determined times, in a consistent and reliable manner, ensuring the hub is well stocked at known times of the week.

Consumers have access to the secure hub, and will pay via honesty boxes to each of the producers, or alternatively to a single honesty box, with an accompanying ledger maintained which records specific food transactions. Payments are made to the producers at the end of each week, with an independent person squaring up the transactions.

Through additional coordination there is also an opportunity to form a buyers club, procuring bulk food supplies from wholesalers or direct from growers who are not local. It could also involve group procurement of goods from places such as the Dunedin Farmers Market. This provides a greater diversity of available food products and as a consequence, is likely to grow the membership base. Managing the procurement of external supplies of food would require additional resourcing and more robust financial systems, though need not be onerous.



The hub itself is a simple building, preferably making use of an existing building that is not fully utilised. It will require hygienic storage facilities, including a refrigerator, and basic items such as scales and robust shelving.

9.5.3. Who Would Need to be Involved?



- People who grow or sell local food;
- A small group of committed consumers;
- A volunteer or part-paid coordinator(s).

9.5.4. Any Issues Around Management of it?

The management could be pretty simple but there would need to be strong house rules established early in the piece. These would cover food transactions, conditions of use of premises, access arrangements and cleaning / maintenance arrangements.

If bulk-buying of products from outside the area was a goal, then robust financial policies would need to be in place, and established written processes to enable uptake from interested people. There may need to be lease or use agreements with the owner.

9.5.5. Any Legal/ Safety / Food Safety Issues?

This enterprise would best match fruit, vegetables, jams and preserves and dry goods. Encouraging sales of dairy and meat produce would be problematic. Food regulations do apply and depend on the primary purpose of the hub and the choice of food for sale. Talking to the Dunedin City Council's Environmental Health officers to discuss options is the easiest and most efficient way to understand what can and can't be done. Outlined below are a couple of different options:

9.5.5.1. Selling a wide range of local food

If, for example, the primary purpose of the hub is to sell local food then the premises must be registered to sell food with the DCC. The "*Certificate of Registration*" is issued by the Council and is required under the Food Hygiene Regulations 1974. There is a wide variety of requirements which must be carefully considered, such as impervious floor and wall surfaces, dust-proof ceilings, hand washbasins provided and hot water supplies being no less than 63°C at all sinks and for washing equipment, and no less than 83°C for every other purpose. See the DCC's "*Opening a New Food Premise Guidelines*" and "*Application of Registration for Premises*."¹³

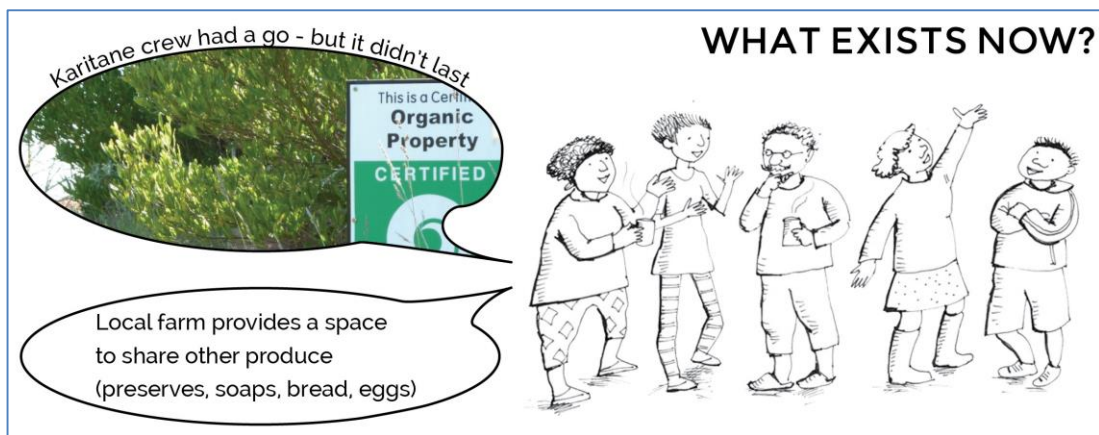
9.5.5.2. Selling preserves and jams

If the primary purpose of the hub is to on-sell specific items, such as preserves and jams, then the hub will be exempt from requiring a "*Certificate of Registration*". This is because the person making the preserves and jams holds the registration. The person responsible for making these items can do so in their own home in a domestic kitchen as long as the producer is registered with the DCC. Registering with the DCC is relatively straightforward; it is a food control plan for jams and preserves, nicknamed the 'Jam Plan' (not available online but visit the DCC to pick up a hard copy) and a slightly different one (but along the same lines) for home baking. The DCC Environmental Health team offer free mentoring to help people set up and implement the 'Jam Plan' to ensure they are doing it correctly. Under the 'Jam Plan', the person would need an annual Food Licence/Registration, the cost of which is minimal (in 2014 it is under \$120). The licensee would not receive a grade like restaurants do, instead they would receive an annual visit and a specific certificate of registration they can produce to any shops they want to sell their product to or if they wanted to attend events or market days, so really it is proof they are legitimate and registered jam/preserve makers.

To stock jam/preserves the hubs would not need to be registered as there is no food preparation or handling required with jams and preserves. Any concerns regarding the jam/preserves sold for example, would fall back onto the producer who would be registered and operating a 'Jam Plan'.

¹³ For further information see www.dunedin.govt.nz/services/environmental-health/food-safety/commercial-food-premises

9.5.6. What Exists Now?



9.5.7. What Infrastructure/Resources Are Required To Enable?

9.5.7.1. Infrastructure

- An unused space that is clean, dry, and has storage and electricity. This is likely to require rent and refurbishment;
- A chiller or fridge;
- Use of the food directory to promote;
- Storage containers;
- Scales, dispensing equipment etc.

9.5.7.2. Anything else

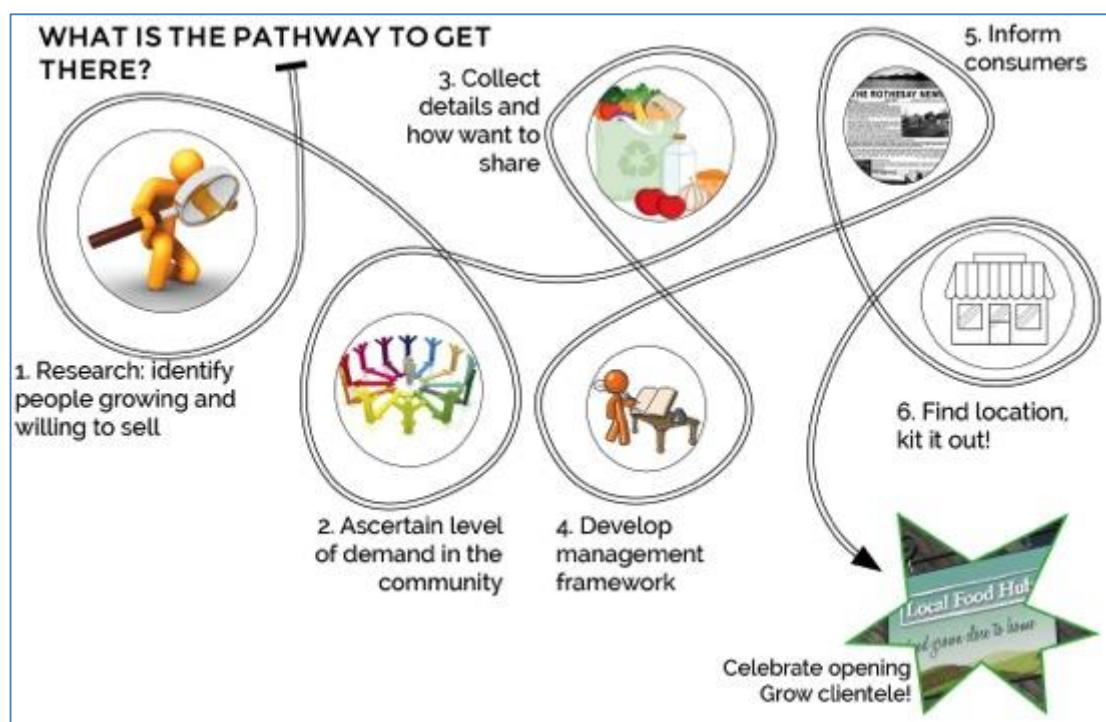
- It provides an opportunity for people starting to grow food specifically to supply the Hub.

9.5.8. Who Would Be Responsible?



- A willing group of volunteers, both growers and consumers, or a cooperative structure.
- A volunteer or paid coordinator would help with the overall management of it.

9.5.9. What Is The Pathway To Get There?



9.5.10. General Feasibility?

Harder than some of the other concepts to get off the ground, but with an enthusiastic group who see the need, this is an opportunity. It is likely to be a venture that starts small, even amongst two to three households, and develops organically from there. Minimal capital outlay is desired to ensure its feasibility. The lack of consistency and diversity of food goods is likely to restrict the community uptake, and as such its viability.

9.5.11. SWOT

Strengths	Weaknesses
<ul style="list-style-type: none"> • Relatively easy to establish • May not need a formal entity or structure 	<ul style="list-style-type: none"> • Low management and coordination will likely result in ad hoc supplies of food goods • Likely to be heavily based around incidental supply of seasonal foods • Currently there is limited consistent fruit and veg production occurring within the area, so food would need to be imported if consistent supply is demanded • Less of a social enabler than other options • Will require development of some processes and rules which may dissuade some people • May be costly
Opportunities	Threats
<ul style="list-style-type: none"> • Can make use of under utilised space that already exists within the communities • Can link with the Local Food Directory, with the hub acting as the outlet for the foods listed in the directory • Could provide the stimulus for growers to establish enterprises to supply the local community. 	<ul style="list-style-type: none"> • Lack of consistent supply of foods is likely to result in low consumer uptake of

- Start off small, with a close knit group that know and trust one another. Allow for organic growth of the hub, as processes and systems become ironed out

- service
- Lack of suitable venue

9.5.12. Connecting to other initiatives?

This concept would link in with the Local Food Directory (concept three) idea. The research collated for the food directory could feed into the Hub concept and local growers may choose to provide food for the hub rather than have local people turning up at their gate.

It could also link to the local food delivery truck (concept six).

9.6. Enterprise Five: CSA Model – Direct Producer To Consumer Sales

9.6.1. Community Vision

“Consumers pay the farmer monthly for food – a cash flow farm, it takes the risk out for the farmer – direct producer to consumer sales.” Our definition of CSA (Community Supported Agriculture) is a partnership between farmers and consumers where the risks and rewards of farming are shared. There are many different ways of arranging for *“the rewards and responsibilities of farming to be shared between consumers and farmers”*. Each circumstance will generate an individual response.

9.6.2. How Would This Function? What People Would Need To Be Involved?



Within this definition, CSA initiatives can be divided according to five core approaches, characterised by their ownership and leadership:

9.6.2.1. Producer-led (subscription) initiatives

An existing producer offers members of the community a share of production in return for a fixed subscription. The share may vary with the vagaries of production (so the risks and rewards are shared), while the subscription is generally payable in advance and for a relatively long term (providing secure income to the producer).

9.6.2.2. Community-led (co-operative) initiatives

An enterprise, owned by the community through a co-operative or similar structure, takes on direct responsibility for production. Labour may be provided by volunteers and / or employed professionals. Produce may be distributed amongst the community and / or sold for the benefit of the enterprise.

9.6.2.3. Producer-community partnerships

The enterprise, owned by the community through a co-operative or similar structure, works in close partnership with existing producer(s) to provide a secure and long-term supply of produce to community members.

For example, a separate farm business with a partnership agreement with a formal community group / co-op. The farm remains in private ownership and food production is controlled by the farmer. There is a separate organisation of community members who organise themselves and join a community group and agree to make some contribution.

9.6.2.4. Community-owned farm enterprises

A farming enterprise is secured through community investment but does not necessarily trade primarily with the community members. Community members may sign a membership agreement and commit to making some contribution and may then have voting rights in the business. They may or may not own dividend-paying shares in the business.

9.6.2.5. Multi -farm CSA

A group of farms work together to supply a loose or formal community, and collectively provide offers of community involvement. The farms may specialise in different crops or produce. They may be separate CSAs with a co-operative arrangement between them.

9.6.3. Who Would Need to be Involved?



- People who grow and want to sell local food to the community;
- People who want to buy food direct from local producers;
- Community members who want to directly support farmers.

9.6.4. Any Issues Around Management of it?

Yes, many. It depends on the type of farming, the type of structure and the demand! The organisational, legal and governance structure of any given CSA will be individual to that entity and will have arisen out of the needs and resources available at its creation.

However, there are a number of legal structures that serve different purposes and assist in determining how the organisation governs itself and how it interacts with the rest of the world.

A clear legal form is important so that the members understand their rights and obligations under law and to each other. Whether the establishment of the organisation is motivated by profit or by social aims, whether the CSA owns land or enters into contracts with landlords or suppliers, if there a few or many members; all these will likely determine what structure is adopted. One key decision here is whether or not to become incorporated, that is to create a legal identity for the organisation separate from the individuals. This has advantages and disadvantages.

Whatever structure is adopted it will be necessary to write a governing document, which will lay out the purpose of the organisation, its internal structure and how it will operate. It will also make clear who is eligible to become a member and the rights and responsibilities of membership. Further, it will detail how the organization

manages itself, how the governing body is formed and the relationship between the organisation and its members.

9.6.5. Any Legal/ Safety / Food Safety Issues?

CSAs require robust legal structures, as discussed above. They provide a good vehicle for the legal sale of meat and dairy products, but are still governed by the same food safety regulations. With appropriate management and governance frameworks, these requirements can all be successfully managed.

9.6.6. What Exists Now?

WHAT EXISTS NOW?

At least two horticultural CSAs in NZ.

COMMUNITY SUPPORTED AGRICULTURE



Local milk farm used CSA model for project



Consumers invest to help turn gorse into paddock, in return receive discounted milk.



A film called: The Real Dirt on Farmer John (2005)

A film all about CSA model.

"Unbelievably special..." —Al Gore

the real dirt on farmer john

★★★★ — Roger Ebert



9.6.7. What Infrastructure Is Required To Enable?

It depends on the type of farming, the type of structure and the demand!

Effectively a working farm is needed, as small or as large as is demanded. Depending on what is being produced, there will be different processing and storage needs. Strong management systems are essential.

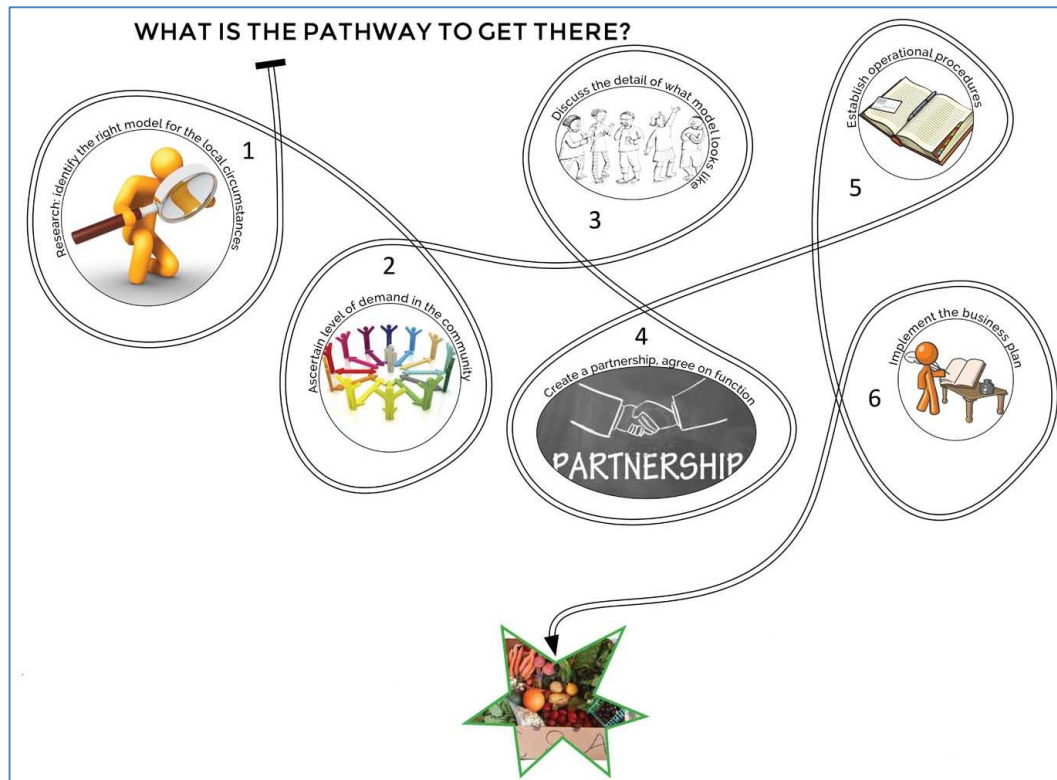
9.6.8. Who Would Be Responsible?



It depends on the type of initiative (see above).

The participative development of a competent CSA project planning group, a core or initiative group at an early stage is essential. Members need a range of food growing, social business and facilitation skills. This group is the seed organisation that then decides, with members, on an appropriate legal form that enables member involvement as well as executive effectiveness in running a social business from which members benefit.

9.6.9. What Is The Pathway To Get There?



9.6.9.1. Research and identify the right model for the local circumstances

There are examples of CSA formed by community groups and others initiated by farmers and growers. There are many different models, each designed to fit the local circumstances.

As in any partnership, as you begin to think about the arrangement, you need to define your offer, and what you would like in return. This will be a starting point for working with your local community. There are many resources local people might offer and many things a farm and farmers might offer local people. This stage should seek to decide whether an enterprise is needed, who the stakeholders are and what the enterprise will produce.

9.6.9.2. Ascertain the level of demand in the community

Ascertain the level of demand, and the demand for what types of food products. It is important to ensure there is a need for an enterprise and that there is the human capital for its support. Commitment, control and clarity of roles and responsibilities are issues that should be discussed. The benefit of research and organisational structure are important at this point.

9.6.9.3. Discuss the detail of what the model will look like

Evaluate the potential and enthusiasm for approaching an existing farmer, versus starting up a new farm etc. A clear statement of objectives and principles should be developed, and an outline of the organisation's form and structure.

9.6.9.4. Create a partnership and agree on function

Agree on how the CSA would function, what people need to be involved, the role of the members, the capital required, the goods to be produced. Develop a business plan and decide on an organisational and legal structure. Evaluate the finance options available (shares, subscriptions, members' loans, bank loans, grants, donations) and budget accordingly.

9.6.9.5. Establish operational procedures and staff roles and responsibilities

Describe the necessary procedures and responsibilities, and any particular responsibilities and legal liabilities of directors and / or Trustees.

9.6.9.6. Implement the business plan

Depending on the business plan that has been agreed to, this may start with raising capital or appointing staff. Once all the organisational structure has been developed, you can turn the soil!

9.6.10. General Feasibility?

Generally feasible if there is willingness from a core group within a community, and demonstrable support from the wider community.

This is an ambitious venture and requires commitment from those who want to develop it.

9.6.11. SWOT

Strengths	Weaknesses
<ul style="list-style-type: none"> • Can rapidly scale up the availability of local food • Connects producers and consumers, and will often result in strong, long-lasting relationships • A sharing of the highs and the lows • Food production becomes more tangible and real for consumers • Supportive of local farmers, and particularly small scale local farming • Likely provider of employment • Strongly contributes to local economy • Provides the growers with enhanced ability to plan their production • Provides an opportunity to truly localize a community's food system, aiding community resilience and the creation of community development opportunities • Provides an opportunity for people who want to farm grow but do not have access to capital or land 	<ul style="list-style-type: none"> • For existing commercial farmers this represents a fundamentally different way of farming, requiring a change in farming systems, marketing and distribution • Potentially significant investment of time and energy in establishing the structures to enable a fully functioning CSA , though it depends on the situation and the scale
Opportunities	Threats
<ul style="list-style-type: none"> • Provides an opportunity to legalise direct sales of red meat, though doesn't avoid the use of an abattoir • Can be established by either an existing 	<ul style="list-style-type: none"> • For farming and growing to be really successful, long-term planning is essential, and this means securing long-term

farmer, someone who wants to farm, or a group of consumers who want to support an enterprise

- May more accurately reflect the true cost of food, as these become obvious to CSA members
- By subscribing a regular amount, members can ease the cashflow and provide some security of income for the farmer's year ahead
- Provides opportunities for work exchanges, education, learning

capital finance. This would require significant commitment from the CSA membership, and represents a major shift in thinking

- The intentions of people within the community may be conflicting. Unless a very rigorous and truly participative process is followed, this could result in unintended consequences

9.6.12. Connecting To Other Initiatives?

Could connect to the delivery truck (concept six) and the local hub (concept 4).

9.7. Enterprise Six: Local Food Delivery (Delivery Truck)

9.7.1. Community Vision


“Mr Whippy type idea– pick up and deliver – by the time you get back to the start of the trip you have everything you need from everyone else.” This concept is based on a pick-up and delivery local food service to your home. The vision is based on a vehicle that drives around the local area picking up what you have to sell and concurrently offering you local food at your door. You pick up what you don't have, by the time it comes back to the start of the trip, you have everything you need from everyone else. It has a bell or a tune or some sound like the old style ice-cream vans (Mr Whippy) to let you know it is coming around.

9.7.1.1. A business?

This concept could be a private enterprise, or a community-owned social enterprise. Any profit for the enterprise will be created via a margin on the produce sold. It provides producers with the ability to scale-up production in the knowledge that a wider market is being developed. The marketing and development of sales would be a crucial aspect of the business, transitioning the local food system from the informal economy to the formal economy.

9.7.2. How Would This Function?

HOW WOULD IT WORK?



1. The delivery truck concept would work within a network of like-minded individuals who wanted to participate in growing and purchasing local produce
2. It would need a champion or a motivated group to invest
3. A "Mr Whippy" type person would be essential, providing the enthusiasm and motivation to scale the enterprise

9.7.3. Who Would Need to be Involved?



- Local growers who constantly have surplus and would like to be able to purchase local produce;
- Local commercial growers, or aspiring commercial growers who want to grow food, but do not have the channels for sale;
- Someone to drive the truck, collect and deliver produce;
- Someone with marketing and business development skills to develop the sales channels, aspiring to scale the demand and supply of local food;
- Local investors, whether privately or via a community social enterprise.

9.7.4. Any Issues Around Management of it?

This enterprise will require significant capital investment, as well as the employment of people to coordinate supply and demand, and to drive the truck. A full business plan would need to be developed, identifying the various risks associated with owning an expensive asset whilst being cognisant of the existing low quantities of food available for sale.

The venture needs to ensure there is sufficient revenue to afford vehicle maintenance, marketing and staff costs.

The enterprise will need to work both up and down the value chain to develop the volume of food being grown locally, as well as the consistency of demand for the food. Currently, there is insufficient food being grown locally to viably support the investment in capital.

9.7.5. Any Legal/ Safety/ Food Safety Issues?

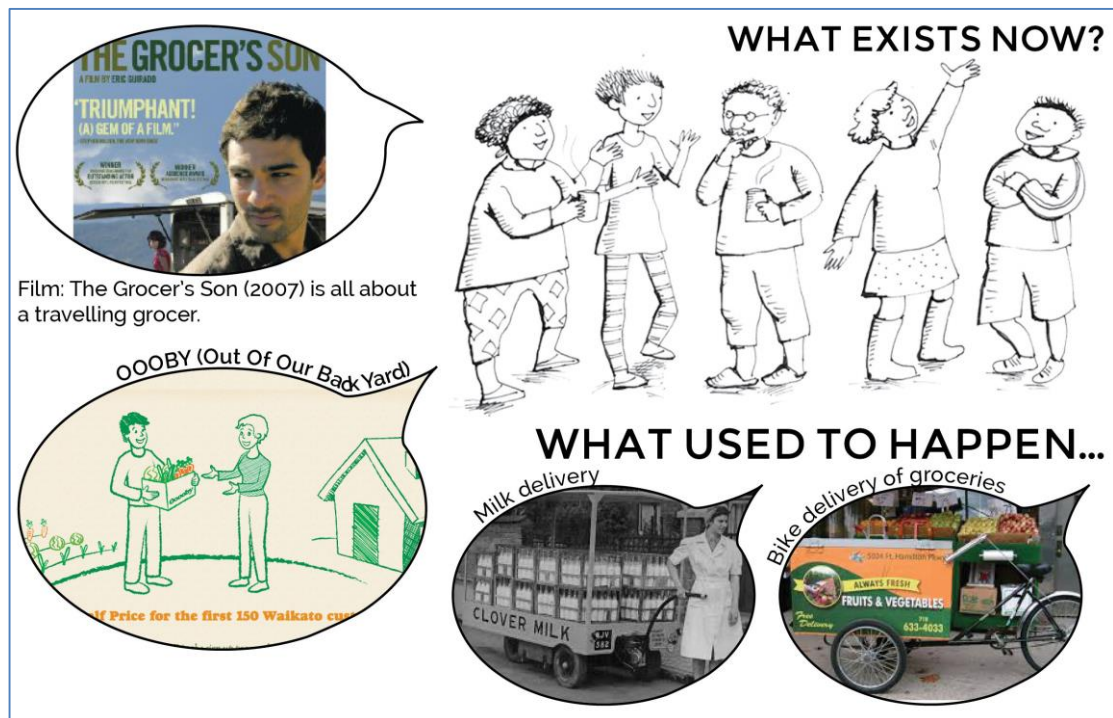
There are significant food safety requirements in order to sell food from a mobile shop. In order to legally trade from a mobile shop an application from the DCC for "Mobile Trading" must be completed. Requirements in order to gain this license include the following:

- Vehicle registration;
- WOF;

- Electrical certificate;
- LPG cylinder certificate;
- Photo of vehicle of stall;
- Public indemnity or liability insurance (for an amount not less than 1 million dollars).

If any part of the operation is going to occur on or affects the roadway, then a Traffic Management Plan may be required. The DCC's Transportation Group will be the people to contact.

9.7.6. What Exists Now?



9.7.7. What Infrastructure / Resources Are Required To Enable?

9.7.7.1. Infrastructure

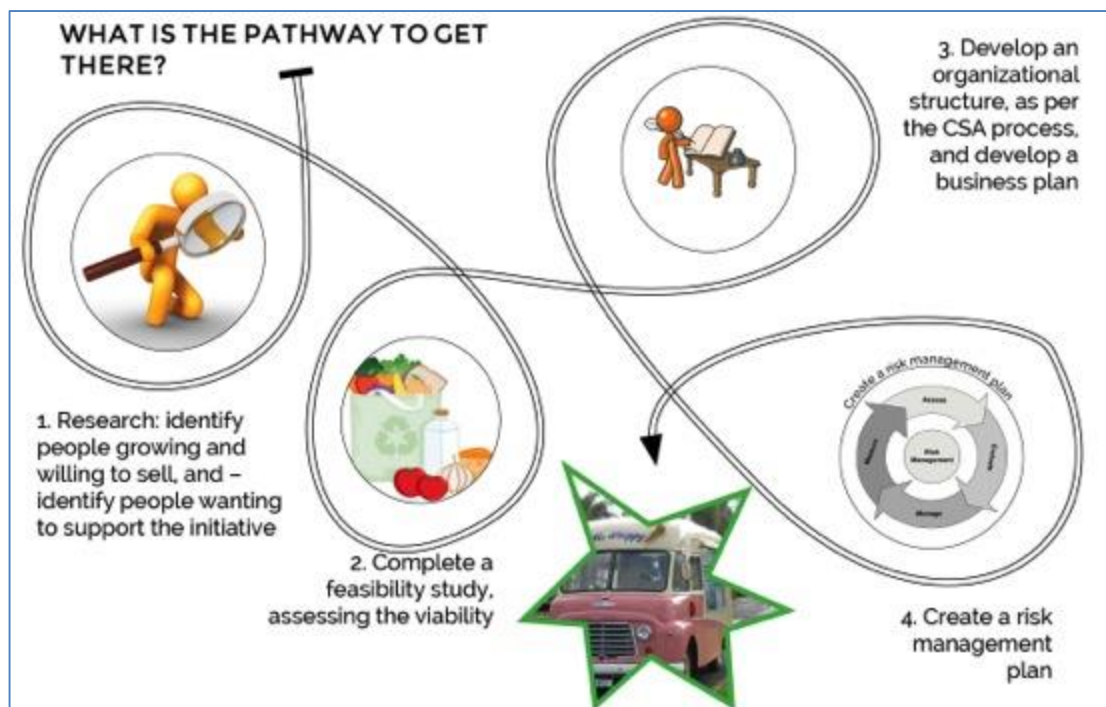
1. A vehicle/truck for collection and delivery;
2. A driver, a food supply coordinator and a marketer. This could be the same person, depending on the scale of the venture;
3. A map of collection and pick-up, including times or places to pick up if person not home;
4. Chiller/sterile area;
5. A significant increase in the volume of local food available for sale.

9.7.8. Who Would Be Responsible?



This is potentially a new independent enterprise or a co-op made up of both producers and consumers. A critical scale of support, from both consumers and producers, would be necessary to make it viable.

9.7.9. What Is The Pathway To Get There?



9.7.10. General Feasibility?

This enterprise requires significant investment in infrastructure, as well as high annual running costs. The existing supply of local food would not viably support this enterprise, and as such, a significant increase in local supply and demand would need to occur first. Significant risk is attached to this venture.

9.7.11. SWOT

Strengths	Weaknesses
<ul style="list-style-type: none"> • Pick up and delivery to your own home • Great way to share produce • Convenient • It is a way to service people who have mobility issues • Could be CSA on wheels (so all the positives that come with the CSA model) 	<ul style="list-style-type: none"> • Potentially expensive to set up and ongoing overheads • Insufficiently accessible and consistent for consumers-resulting in limited uptake • Less of a social enabler than the stationary hub idea • Very hard to organise (logistics are complicated) • Cost could be put onto the consumer to cover the expenses associated with this project • Significant resourcing required to grow the supply and demand for local food that is necessary to support this

Opportunities	Threats
<ul style="list-style-type: none"> • Could take the concept around the whole of the Blueskin Bay area, a way to connect up all the smaller settlements • It is a way to provide a service to people who find it difficult to access local food 	<ul style="list-style-type: none"> • Insufficient people providing and purchasing the produce that is needed • Insufficient being able to make enough money to pay for the resources needed

9.7.12. Connecting To Other Initiatives?

This enterprise could connect to Concept 3: Local Food Directory and 4: Local Food Hub.


9.8. Enterprise Seven: Co-Operative And Hub

9.8.1. Community Vision

“We want to have somewhere local to go (instead of supermarket or farmers’ market) somewhere that has the basics; bread, cheese, deli style, preserves, local vegetables, and maybe even a coffee machine. It would need to be reliable. It could be a cooperative. It needs a place and a personable person to make it happen. It would need a base kitchen where foodstuff can be prepared in a safe kitchen and made available to the public.” “Could be to order, kind of like a ‘beefed’ up vege box scheme.” And, “It could connect up to food banks/foodshare and unsold produce is given away.”

9.8.2. How would this function?

HOW WOULD IT WORK?



The hub (retail / distribution) would be owned by the co-operative. Any processing infrastructure would be also be owned by the co-operative or by local people and run as a small business enterprises, either charging users a fee for its use, or the processors purchasing the raw products and value adding for local sale.

The hub will provide the physical location for community members to meet, but also to carry out the many associated functions. These functions include the aggregating, processing, storing, marketing, selling and distributing of food products. In the short term, establishing such a food hub may require taking advantage of existing spaces and infrastructure. Such assets might include processing and storage amenities (walk-in freezers and dry storage), church, hall or school kitchens, and community centres or local cafes (retail and processing).

It is clear that one of the reasons the supermarket regional distribution model works is because of the economies of scale they are able to achieve. Individual small growers producing small volumes are unable to do this. It seems therefore that these hubs will need to achieve a certain size, and produce a certain diversity of products to be sustainable, and may also need to do more than just distribute food in order to be viable.

MORE THAN THE LOCAL FOOD HUB

A more diversified model for a food hub, which involves a number of different elements that work together to create a vibrant, robust and sustainable social enterprise. This is based on the idea that a hub is an intermediary that, by pooling together producers or consumers, adds value to the exchange of goods and promotes the development of a local supply chain. This added value may be gained through economies of scale, social value, educational work or other services. In other words, the pure function of distribution is only one element of the hub.

This aims to hit the middle ground – somewhere between the micro and macro.

Two key parts to this:

1. The human element – a co-operative food networks of growers / farmers and consumers, the workers within the hub, any processing enterprises, distribution managers etc
2. The physical infrastructure – a hub: aggregation and distribution; sale / retail, processing, value-add enterprises

A co-operative food network:

This could include various stakeholders such as farmers, processors, retailers, educators, community members and consumers. Having the organization take the form of a co-operative is a key component. A co-operative will ensure that a business model is developed to serve the currently disparate functions of our food system, such as production, processing, marketing and sales. Furthermore, the network will serve as a place to learn about food by providing shared information, as well as workshops and education programs.

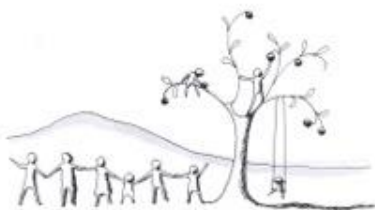
- Connected growers / farmers, supplying the hub, assisting each other (coordinated supply etc)
- Connected consumers, using the hub as their preferred site place for food procurement.
- Connecting growers to consumers / Growers to processors / volunteers with growers and processors
- Connecting producers and value-adders to other markets (eg. Supermarkets)

The physical hub:

This involves the development of a new business enterprise that would require considerable investment in infrastructure, in-house systems and related components of the food system. There are several components to it, each of which could form a part of the enterprise, depending on the community objectives. The components are:

- Site for product aggregation
- Base distribution hub for locally produced food (as above)
- Distribution site for wholesale bulk goods that have been 'imported' from out of town (as above)
- Certified base kitchen available for community members / enterprises to use to process foods for sale.
- Processing infrastructure. Eg. a small grain mill, or an olive oil press, or a cider press.
- Linkages with other market outlets, such as supermarkets, with the hub providing the means by which growers can aggregate, distribute, and / or process food goods for on-sale.
- An overlying brand, enabling on-selling into other market places.

9.8.3. Who Would Need to be Involved?



local economy.

In the long term, a dynamic food hub model will provide an opportunity to engage entrepreneurs, producers, and consumers under a single roof. As such, entrepreneurs can contribute capital investment and new businesses, producers have access to processing facilities and retail markets, and consumers can purchase products, benefiting the

A food hub(s) will not only allow the entity or co-operative to carry out its many associated functions, but will also act as a hub to implement many other local community initiatives. For example, it could be used for local food workshops to improve food literacy in the community, or for training in growing and processing food.

The responsibility for this will lie in the hands of the co-operative, once developed. The co-operative will take the initiative to gain access to existing spaces and, when enough resources are obtained, to create a new food hub space or spaces.

9.8.4. Any Issues around Management of it?

This proposal involves the establishment of a significant not-for-profit business enterprise. The following would need to be developed prior to establishment:

- A feasibility study and full business plan;
- A formal cooperative ownership structure, with associated constitution;
- Management and financial systems;
- Formal entity, registered with the IRD and the Charities Commission;
- Bank accounts etc.;
- Health and safety policies;
- Employment policies and structures;
- Waste management (e.g., disposal of waste fish, veges, etc.).

Whatever structure is adopted it will be necessary to write a governing document. This will lay out the purpose of the organisation, its internal structure and how it will operate. It will also make clear who is eligible to become a member and the rights and responsibilities of membership. Further, it will detail how the organisation manages itself, how the governing body is formed and the relationship between the organisation and its members.

9.8.5. Any Legal/ Safety / Food Safety Issues?

Refer to Enterprise 4: Local Food Hub (section 9.5.5).

9.8.6. What Exists Now?

WHAT EXISTS NOW?

Taste Nature exists in Dunedin

Taste Nature is a private enterprise not a co-operative, and does not perform many of the functions of the hub (such as a processing facility or an on-seller to supermarkets etc) but it does actively support local growers and community initiatives.

Other similar projects?

Port Chalmers' **NEW WORLD** is a commercially operated collective.

Blueskin Market is a cooperative.

The infographic features a photograph of the Taste Nature storefront in Dunedin, a cartoon illustration of five diverse children, and logos for New World and Blueskin Market.

9.8.7. What Infrastructure/Resources Are Required To Enable?

9.8.7.1. Infrastructure

- A clean, dry space that has the ability to provide retail, processing and distribution functions;
- It will require electricity, chillers and freezers;
- It will require ease of access for suppliers;
- A processing space, with base kitchen in place;
- All associated equipment with processing and retailing food.

9.8.7.2. Anything else

The hub could also act as a place to facilitate the transfer of food goods, such as vege boxes. It could connect up to food banks or food share, making productive use of excess food during periods of surplus.

9.8.8. Who Would Be Responsible?

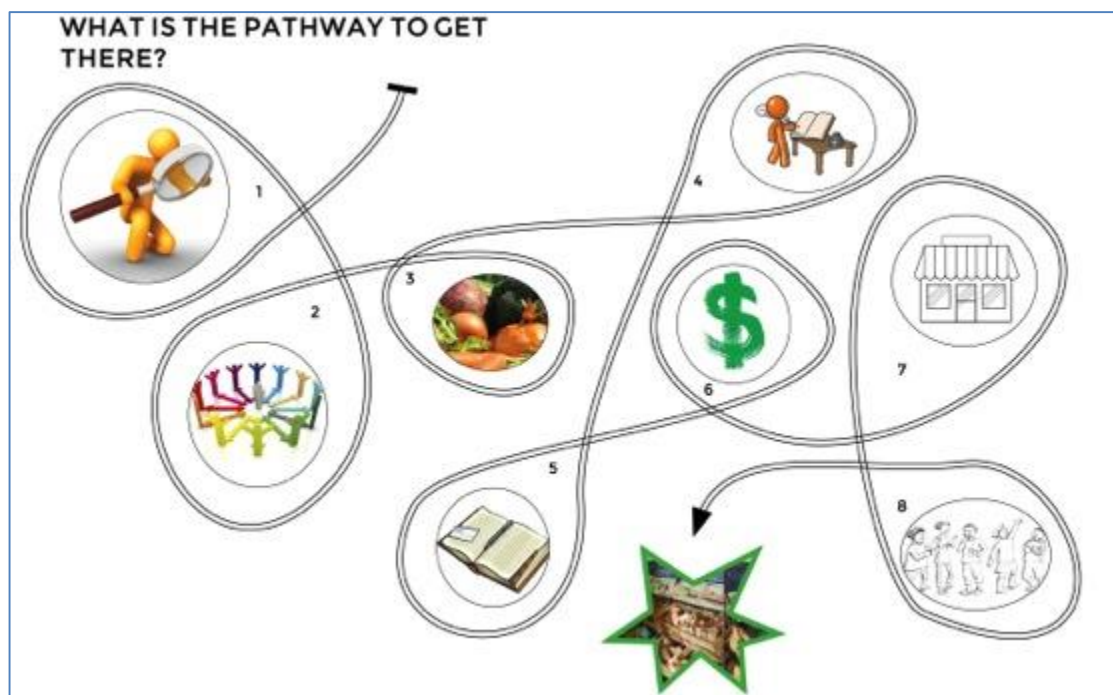


A formal co-operative. Could be a growers' co-operative, or a community co-operative of buyers and sellers.

A co-operative will allow for all the members to acquire a financial stake, while it also gives its members governance, ownership and control over the association.

Workers could be co-operative members or could be employed.

9.8.9. What Is The Pathway To Get There?



9.8.9.1. Conduct research

Research to identify production capability (both commercial, small-scale and backyard) and interest in supplying.

9.8.9.2. Ascertain the level of demand

Ascertain the level of demand from the community. Will they support it by becoming co-op members?

9.8.9.3. Identify gaps in supply

Could the missing food types be grown locally? Will they need to be imported?

9.8.9.4. Complete feasibility study

Complete a full feasibility study and business plan. If feasible, continue with the next steps:

9.8.9.5. Register the co-op

Further develop then register the co-op entity.

9.8.9.6. Find investment

Seek investment to establish the infrastructure and develop management systems.

9.8.9.7. Find a location

Find a suitable location and kit it out.

9.8.9.8. Employ staff

Employ staff where needed and then launch!

9.8.10. General Feasibility?

It is unlikely there is a large enough local population to support such a significant enterprise. The costs of development will be significant, and will rely on a large consumer base for financial viability. Even though the existing food retail enterprises that exist in the settlements of Blueskin and Karitane do not explicitly support local food, they are providing existing options for consumers which appear to adequately meet the needs of many in the community.

9.8.11. SWOT

Strengths	Weaknesses
<ul style="list-style-type: none">• Will increase the supply of local food into the community. This could be directly via the hub, or via secondary markets (other stores)• Provides the structure to enable growers to pool together (a co-op) to enable more effective distribution and sale• Increased potential to supply consistent food, and a diverse range of food• Encourages growers to work together, growing to their strengths, and not directly competing with other growers.	<ul style="list-style-type: none">• Higher costs, including constant overheads and staff costs• Considerably more risk for members of the

<p>Team work!</p> <ul style="list-style-type: none"> • Likely increased return to growers, though dependent on co-op overheads • The scale will increase the likelihood of being able to provide a consistent and reliable supply of local food • It could help to revitalise community facilities • Provides employment opportunities • Provides for the core consumer needs of being accessible, reliable and convenient • Provides a more sociable place to shop • Make it easier for people to shop by foot or by bike • Provides food that often has less packaging, and therefore generates less waste • Helps to support local producers, growers or other smaller or more ethical suppliers by providing an outlet for their goods • Will assist larger growers to access new local markets (including beyond the hub) but at a scale that is viable for them • Helps ensure money spent stays in the local economy 	<ul style="list-style-type: none"> • cooperative • Significant due diligence work required prior to development • A need for a specific entity or structure, with robust financial and management systems in place
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Opportunities	Threats
<ul style="list-style-type: none"> • Could act as a focal point for local people to meet up and make new friends • Helps raise awareness of the benefits of eating a healthy diet • Provides consumers with diverse range of local food that has a very short field-to-fork journey • Seeing what is being grown by other people on their doorstep may also encourage consumers to have a go at growing themselves • An incubator for enterprises - providing the stimulus for growers to establish commercial enterprises to supply the local community OR for commercial growers to become a part of a functioning cooperative • Could provide an outlet or system to supply mainstream outlets such as supermarkets 	<ul style="list-style-type: none"> • Will need consistent support from the local community to ensure its viability • Insufficient population to support such an enterprise • Existing food retail enterprises operate in the area, providing competitive food supplies to the community • The local community demand “affordability” and may not be prepared to pay for high quality, local food

9.8.12. Connecting To Other Initiatives?

This concept could connect with Concept 4: Local Food Hub (just a bigger, more commercial version) and Concept 6: Local Food Delivery Truck.

9.9. Summary Of Enterprises and Initiatives

In this chapter we developed a set of initiatives that were sparked by conversations with community members (chapter six). Each were then presented back to community groups and discussed, providing clear levels of support for each. The next chapter explores where to from here.

Chapter 10.

Where to From Here for Enterprise Ideas Developed with Residents?

10.1. Introduction

Each of the seven enterprises were discussed by those who attended workshops in each of Purakaunui, Waitati and Karitane. Discussions were varied and the responses from each of the community groups differed, reflecting the different character, experiences and outlooks of those in attendance.

This section assesses each of the enterprises against the Food System vision and guiding principles (see Chapter 8). The criteria to be used are as follows:

- Does the enterprise maintain or enhance the celebration of food?
- Does the enterprise maintain or enhance community knowledge of food?
- Does the enterprise support food growers and producers?
- Does the enterprise enhance the supply and distribution of local food?
- Does the enterprise make food affordable and accessible?
- Does the enterprise encourage a diversity of food?

Three further criteria were used to assess the community response to the enterprises:

- Do the communities believe the enterprise is viable and feasible?
- Are the communities supportive and enthusiastic about the enterprise and is there a desire for action?
- Do the communities believe the enterprise is achievable?

Poignant and defining points are summarised in the table in *Appendix E:*

Summarised Community Feedback on Initiatives and serve as succinct conclusions as to the level of support each of the enterprises obtained from the community members who responded.

10.2. Community Conclusions ... about The School Food Stall Enterprise

The school food stall was positively received at each of the three community workshops, with discussion of the positive effects that could be realised via a food enterprise that is managed and organised by the school and its pupils. The links with education and raising awareness of the value and importance of good food are clear. However, concern was raised about the viability and achievability of the enterprise. The most significant point raised was the incompatibility of timing between the school terms and the peak harvesting periods for fruit and vegetables. Though there were potential solutions to overcome this issue, it was significant enough to dampen the

enthusiasm of some. Other concerns were that the stalls would receive the same type of surplus crop from each contributor, thereby lacking diversity and use; and, that the stall would compete with fledging micro-enterprises.

10.2.1. Next Steps for the School Food Stall

Some of the schools within the project area have been involved in conversations about school food stalls, with the general response being positive. BRCT, or individual enthusiasts within the community, could continue to promote these conversations to the point of individual schools making their own decision about the viability of such an initiative.

10.3. Community Conclusions about the Harvest Celebration Enterprise

Support for harvest celebrations was strong from all participants, most notably from the communities who are not currently engaged in such activities. A mixed response was apparent from the Waitati workshop respondents, partly because there is a monthly market underway, and partly because of the belief that previous harvest celebrations had run their course. The positive social impact of these activities is obvious and is cherished, forming a strong component of the informal food economy. Such celebrations have been shown to be successful in Waitati and continue to morph into new occasions. The viability and enthusiasm has been demonstrated, fuelled by the Blueskin community's strong sense of place. Other settlements can learn from these experiences and, on a practical basis, utilise the infrastructure and techniques that are well established in Waitati, whilst adding their own provenance to the occasion. Two recent ideas that were received in this process were a "wild foods" celebration, and an annual "swap-with-thy-street" festival. The knock-on effects of such celebrations are increased transfer of knowledge, skills and physical support amongst community members.

10.3.1. Next Steps for the Harvest Celebration

There are individuals within each community who have either traditionally led the development of harvest celebrations, or through the course of this process, have become excited by the potential of embarking on a similar initiative in their own patch. Existing or new community groups or organisations could potentially take the lead in promoting a local food culture.

10.4. Community Conclusions about the Food Directory Enterprise

The food directory was considered by most participating community members as being a low-cost and effective tool for connecting residents with each other to share and exchange food. Learning and awareness of the availability of local food is clearly defined, as is the potential for new community relationships and strong communities. The food directory was also seen as a viable way of distributing food amongst the community, and of catalysing the development or expansion of new

food enterprises. Deemed achievable and viable, community enthusiasm for this enterprise was high. Ideas for the practical development of the Food Directory were diverse, and included making use of existing community media such as the *Blueskin News* or developing an on-line system that allowed for constant updating to ensure supply details were relevant.

10.4.1. Next Steps for the Food Directory

Conversations have begun with groups involved in promoting local food, such as Dunedin's Our Food Network about hosting a local food 'trading function' on their website. This function would provide both a food directory which provides details of growers and their produce, but also enables each grower to provide real-time updating of their available supply. Our Food Network's website is still being developed, but given the principles and vision of the group, they are very well placed to oversee such a function. The Dunedin City Council is also being engaged on this topic, as a part of its focus on food resilience.

To complement the web-based 'trading function' it is appropriate to also use local community newsletters such as *POWA* and *Blueskin News*. Though these medium would not be able to be updated so regularly (and thus they could become dated in very short time frames) they do provide an alternative form of media that will be more accessible to some residents.

10.5. Community Conclusions ... about The Community Food Hub Enterprise

The food hub, or hubs, was strongly supported by some workshop respondents, and were met with relative ambivalence by other respondents. Those individuals who were positive about the enterprise concept considered it to meet needs of enhancing community access to local food, and in doing so, building a critical mass of support for local growers. The development of a new distribution system was considered important as both an enabler of social capital, and economic capital. Its role as a catalyst in building demand for local food, and thereby supporting new or expanding growers to supply the community demand for local food, was highlighted. The potential to integrate local food-centric hubs within existing food businesses, such as convenience stores and supermarkets, was flagged up by each workshop group. That is, developing working relationships with existing food retailers to encourage their procurement of local foods. This would allow producers to leverage off existing infrastructure and well developed management systems. Responses from distributors in the qualitative research support this attitude, suggesting viable local economic opportunities are possible.

Other real-life options for hub enterprises that became apparent during this research was the idea of a new retailer providing rentable space for growers to sell their produce, thereby clustering the local food production in one space. This distribution mechanism would likely stimulate community support for local produce, by virtue of providing convenience and accessibility to consumers. Distribution mechanisms that meet these needs of consumers are likely to stimulate the development of a local food system.

10.5.1. Next Steps for the Community Food Hub

During the course of this project we have uncovered a number of opportunities for people to supply local food into existing or newly established premises, throughout the Blueskin and Karitane foodshed area. Some of these premises already sell food and have expressed a desire to stock more local food as a part of their product range. Other businesses are new enterprises and though they are not selling food as their primary product, they are enthusiastic about making local food available to their communities and would like to sell and distribute food as a part of their product range, leveraging off the accessibility and convenience that their premises provide. Anyone who is interested in opportunities to sell their food products through a retail environment should contact this report's authors.

During the process of completing this research we have learnt and compiled a considerable amount of information about the regulatory requirements of managing food in publically accessible premises. The complexity and type of food safety regulations depend on the type of food being sold, and handling requirements. Given the multitude of food handling and selling scenarios that are possible, it is not plausible to cover all of them in this document. However, anyone who is contemplating starting a food-selling business, and who needs to understand what regulatory needs must be met as a part of that business, should contact the Dunedin City Council's Environmental Health Officers.

10.6. Community Conclusions ... about a Community Supported Agriculture Enterprise

Most people involved in the assessment of enterprises supported the concept of Community Supported Agriculture (CSA) due to its potential to fundamentally change the way that people engage with food, and with the other people involved in the supply chain – whether they are consumers or producers. The trust, transparency and engagement that is a part of any robust CSA results in the sharing of the rewards and risks associated with growing food, and has the potential to markedly enhance consumer understanding of food production, the value of food, and the importance of it to our culture. As a social enabler, the concept of a CSA was considered by most people to be powerful. As an economic enabler, the concept of a CSA was also considered strong, with growers particularly buoyed by the possibility of constant purchasing support for their products and the forward planning options that this would provide them with.

However, for all the ideological support for the CSA concept there was concern about the large investment of time and energy needed to establish a CSA entity, and a concern that the broader community support for such a venture would be insufficient. In short, some people doubted its achievability.

10.6.1. Next Steps for Community Supported Agriculture

The development of a CSA will take concerted effort and energy from community members who can clearly see the value in bringing consumers and producers together to develop an alternative food system which provides obvious benefits to all

parties. Though ambitious in scope, it is important to note that such systems are becoming well established in small communities throughout the northern hemisphere. As such, there are some useful resources available which guide communities through the process of developing CSAs, taking at least some of the structural work out of the process. The authors of this report have compiled resources which will be of use to community members, and can be contacted for this information.

What can't be borrowed from others is the need for passion and motivation to drive an initiative such as this. However, it is also an initiative which requires multiple community members to engage, and that to be successful needs to be organised and influenced through collective action. Ultimately this will ensure its achievability and sustainability. The authors of this report have a strong understanding of both the process of establishing a CSA, as well as having encountered a number of people who would be interested in beginning a conversation about CSAs, and as such would be happy to help community members embark on such an initiative.

10.7. Community Conclusions ... about The Food Delivery Truck Enterprise

The food delivery truck enterprise was greeted with chuckles by some, nostalgic thoughts of childhood by others, and by some as a viable enterprise for providing food to remote communities. Again, it was considered positively as a social enabler, a connector of communities, and as a mechanism for increasing the supply of local food into communities. However significant doubt was cast on its feasibility as a venture, and its achievability. The low levels of available local food were not considered to be sufficient to support the capital-intensive investment in this enterprise. Though many people saw the potential for the food delivery truck to provide a role in aiding the food security of the more isolated communities, there was considerable discussion that other ventures – such as developing allotments or community gardens – would deliver the same benefits with greater social benefit and less financial risk.

10.7.1. Next Steps for the Food Delivery Truck

Given the significant capital expenditure attached to this venture, and the comparative lack of enthusiasm for its implementation, we do not see any incentive to take further action.

10.8. Community Conclusions ... about The Co-op and Hub Enterprise

The idea of establishing a “local food hub” under the structure of an organised cooperative was not well received by the community participants. Though people identified with the concept, and could visualise having a coffee while their flour was being ground, all participants felt that such a venture was beyond the scale of the Blueskin and Karitane communities. The expense, risk and scale of the task are

considered to be infeasible and unachievable. As a consequence, enthusiasm for this idea waned.

10.8.1. Next steps for the Co-op and Hub

Given the significant capital expenditure attached to this venture and the lack of enthusiasm for its implementation, we do not see any incentive to take further action.

Chapter 11.

The 'Layered Cake' Approach to the Food System

11.1. Introduction

As Marilyn Waring argued in 'Counting For Nothing' (1988), the economy is a 'layered cake' where *"the unmeasured, nonmonetary section of the economy and environmental degradation [are] not some peripheral part of the economy [... and] not a slice of the whole, but a whole layer of the whole"* (ibid., p 243). Similarly, in 'Wellbeing Economics' (2014) Dalziel and Saunders encourage us to think of economics for a full world, with hard environmental limits that must be recognised if our economic activity is to do what it is designed to do, i.e. to *"promote the wellbeing of persons"* (ibid.).

Mechanisation of agriculture, which can be dated from the 1793 invention of the cotton gin, a device which separated cotton lint from seed (Carolan, 2012, p.16), signals the start of the industrial food system, and the replacement of labour with (economic) capital (ibid.). Increasing complexity of the industrial food system, which often depends on complicated procurement, futures markets, preservation and substitution techniques, intensification of production and monocropping, etc., creates distance between producers and consumers. As a result, it can frequently contribute to environmental damage, because of the complexity and invisibility of connections within the system and lack of recognition of capitals other than economic capital (i.e. human capital, social capital, cultural capital and natural capital (Dalziel and Saunders, 2014, p46).

The 'layered cake' approach makes those invisible parts of our food system visible. Food in the informal economy is so much more than unregulated economic activity. It is also crucially a way of creating social meaning (Willis & Campbell, 2004), and increasing wellbeing while providing food for the table.

We can consider the place of food in Blueskin and Karitane as one of the layers in the cake of economic activity, contributing not only economic benefit, but also other tangible benefits like maintenance of the natural environment and intangible benefits like community connectedness.

11.2. Establishing Trust

In interviews, respondents commonly reported that local food provided a wide array of benefits to the individuals consuming the food, and also to their wider families and communities. One recurring theme established through the interviews was the sense amongst respondents that their local food system, such as it exists, is important for creating strong community relationships and social cohesion.

'Trust', developed through growing personal relations and knowledge, is one of the key attributes of a cohesive community and appears to be an important part of the local food system: "*People buy our food because it tastes good, it is fresh, it is healthy, and they know they can trust us. After all, we are their neighbours, we're part of the same community, we are not going to do anything to breach their faith in us.*"

Trust is not some quality constrained to the informal economy as it relates to food. Commercial growers at the farmers' market valued relationships with their clients/consumers, and the way "*having a relationship*" allowed trust to develop. One certified organic grower stated, "*No one has ever asked to see our certificate, they simply trust us because they know us.*" Another producer said, "*People buy for trust and value ... the real deal, quality.*"

A key finding is that those who make transactions within the local food system (within both the formal and informal economy) are doing so because they trust and value the quality of product that can be delivered locally. In turn, producers who participate in the local food system enjoy greater pride by knowing their food is consumed locally.

11.3. *Kaitiakitanga*, or Environmental Guardianship

Kaitiakitanga is a Maori concept that refers to traditional environmental guardianship. It contains a spiritual and value driven component, rather than formal rules and regulations, and reflects a whole world perspective¹⁴. Residents in the Blueskin and Karitane foodshed have a strong history of sharing skills, knowledge and celebration of food. The first wave of human (Maori) settlement dates from sometime in the 13th century (McGlone and Wilmshurst, 1999) and the second (European) wave of settlement in the Blueskin and Karitane foodshed area dates from the first half of the 19th century. New foods and food production practices emerged from both settlement streams. In the present era there are many indications that an ethic of stewardship and/or guardianship of our natural and physical resources is widely practised and valued. Residents in the Waitati settlement in particular have a particularly strong history of food-related guardianship and celebration, probably due to Waitati's status as being the largest settlement in the wider Blueskin area with a sizeable number of peri-urban households, its possession of core physical community assets, and (possibly most significantly) the leadership and food growing expertise that exists within this community. At Karitane, the marae is a focal point both for community events and celebration as well as providing *kaitiakitanga*, both through instigating the development of a *taiapure* (local fishery) on the East Otago coastline¹⁵ and more generally¹⁶. Establishment of the *taiapure* was a significant

¹⁴ *Kaitiakitanga* is a term "derived from the word '*kaitiaki*' which includes the concepts of guardianship, care and wise management" (cited in Kai Tahu Ki Otago, Natural Resource Management Plan, p.9). "Prior to 1840 and the subsequent implementation of the new colonial order, it can be reasonably said that *mana* and *kaitiakitanga* were often synonymous" (ibid.).

¹⁵ The *Taiapure* was "applied for in 1992 in response to concerns of elders of Kati Huirapa ki Puketeraki for diminishing paua stock" (Kati Huirapa Runaka ki Pukerterapi 2015).

event. “*Kaumtua of Kati Huirapa ki Puketeraki were concerned over depleting paua stocks within their rohe and wanted a way to be able to reassert their rangatiratanga for their present and future generations to ensure the maintenance of health and well-being*” (Kati Huirapa Runaka ki Puketerapi, 2015).

Efforts to establish a *taiapure* and promotion of local, organic farming, gardening or horticulture have not all been plain sailing. However, as Dalziel and Saunders argue, “*a community’s cultural vitality is driven by dynamic, diverse and perpetual arguments on what kinds of lives people have to value*” (1994, p.32). So it is in the practice of passing on, in changing circumstances, traditions, knowledge and values from generation to generation that we build ‘cultural capital’ (ibid., pp46-49), and understand our reliance on, and responsibility to ‘natural capital’¹⁷, and practice *Kaitiakitanga*.

11.4. Trade and Gift

Trading, bartering, swapping or just giving, the mechanisms that comprise the informal economy as it relates to food are simple and strong, reliant on human effort and relationships. Our research indicates food is regularly gifted between households, to neighbours, family, friends and those that are perceived as being in need of good food.

While Waitati participants could detail many instances of mutual help, there is evidence that residents in other Blueskin settlements equally value the sharing of knowledge and skills. However, it is notable that Waitati respondents were the core group to speak strongly of the social benefits of local food extending beyond inter-household relationships. Other settlements, including the more outlying parts of the Waitati valley, saw the potential for increased social cohesion via food, but typically spoke of the *opportunity* rather than as an existing feature of a local food system.

It is apparent that across these scattered settlements there are strong informal networks, and numerous transactions within the informal economy, supplying food to individual families, neighbours, friends and the wider community. Some local initiatives, such as one in Karitane, provide simple and robust structures for small community groups to secure externally produced food at reasonable prices, improving the affordability of food and building social capital at the same time. Other households participate in these informal local food exchanges because they perceive that local food is healthier, more nutritious and tastier.

11.5. Developing a Local Food Culture

The success of community actions to establish food enterprises was discussed by a number of people from Waitati, but not in other settlements. “*WOO fund-raised at*

¹⁶ See, for example, Kai Tahu ki Otago (undated: pp 44-48).

¹⁷ Dalziel and Saunders (2014) define cultural capital as “the idea that each generation passes to the next generation not just economic wealth, but also a rich set of dynamic traditions, values and artistry that comprise a young persons cultural inheritance” (pp.45-46) and natural capital as “the quality of environmental ecosystems” (ibid.).

the harvest market and we used that money to go towards the open orchard. Then any wasted fruit was used to make cider ... intention was to create a community asset. All of these things have grown out of community action." Alongside the clear message that one action has catalysed further projects is something contained within the quote above: collective effort is contributing towards a shared food culture in the community.

The presence of a 'food culture' is something that appeared in a number of interviews, expressed in different forms. For example: production practice (i.e. collective juice pressing); desirability of a local cuisine; or simple appreciation of local food (and local social food events). Certainly though it appears that all are talking about food culture in the sense that residents have or develop a connection to food in a rich sense, through producing, celebrating, and providing for those in need.

Understanding the seasonal nature of food; knowledge about the nutritional value of food; learning what is possible to grow locally; the opportunity to get involved in growing, trading and celebrating food, as well as the broader social and cultural benefits of local food: these too can be seen as elements of a local 'food culture'.

People growing food together, trading food, or celebrating harvest provide evidence of a growing food culture. Some specific observations about the food culture within the project area, (and related social outcomes), are summarised here:

- The hunter / gatherer culture is alive and well. This forms an important part of the existing food system, along with people's identity with both their community and their landscape, and contributes to maintaining livelihoods.
- Locals have a reputation for celebrating specific harvest events, such as apples and potatoes, and these events are successful at creating awareness of local food and seasonality.
- Significant backyard or "over the fence" trading of food products occurs, typically on a seasonal basis and during periods of excess production.
- The commercial rural economy is a strong and desirable part of the Blueskin and Karitane economy and is respected by others in the community.

Clearly there are opportunities to focus on the local food system to further grow a 'food culture', and enhance pride of place. A 2014 event and associated fund-raiser that hints at the development of a 'Blueskin cuisine' comes from the Waitati School Sesqui Centenary. Supported by the school community, the School produced a beautiful cookbook (figure 37, overleaf) giving profile to local food and recipes. In the message at the front of the cookbook, Waitati School Principal Heidi Hayward wrote, "*As part of our lovely environment, we also keep an edible garden and cooking is a significant component of our weekly programme*" (Waitati School, 2014).

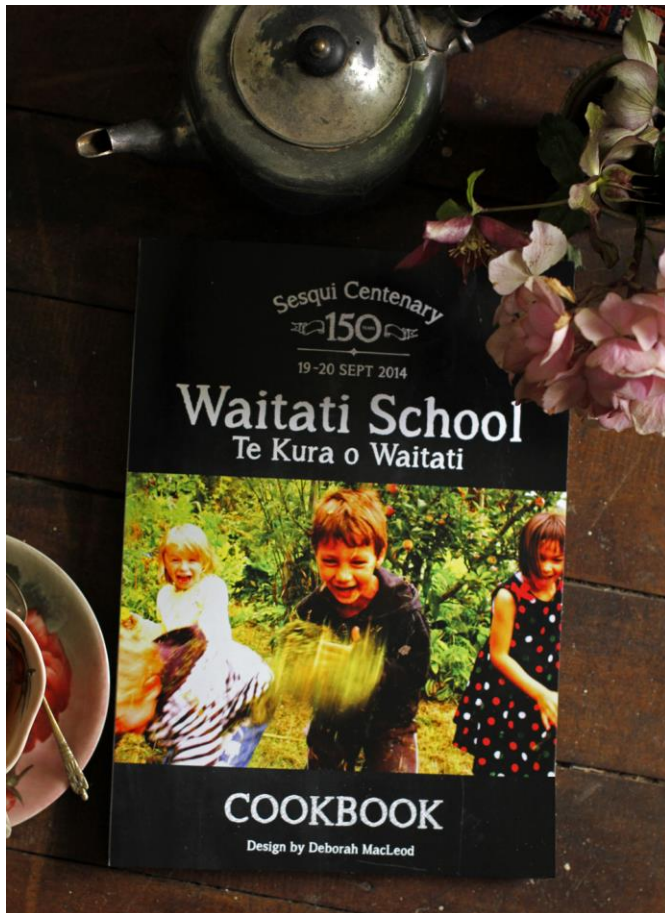


Figure 37: Waitati School Cookbook (Photo courtesy of Greg MacLeod)

Local cuisine, and local food culture, is also expressed at the Horopito Café at Orokonui Ecosanctuary. On their website it states that the café is “*Committed to using local, native and natural produce; from the finest locally sourced organic vegetables and free-range meats to creatively using edible native plants and spices.*”¹⁸

11.6. Growing Skills

The skills related to food production and transformations are signifiers of different forms of ‘capital’. ‘Human capital’, for example is related to human resources either possessed individually or collectively as skills, abilities, level of education, etc. Land, water, air and all physical aspects of our biosphere are collectively known as ‘natural capital’ while ‘social capital’ is related to social networks.

The impacts of the developing local food system are clearly providing more than the physical output of food. The growing of food within these settlements is providing a vehicle to increase the capabilities of settlements and the skill competencies of individuals within the community, and as such is acting as a catalyst for community development. Related outputs such as increasing public and communal access to public land and a growing number of community events, which can be thought of as

¹⁸ www.oroikonui.org.nz/content/horopito%20cafe.php

developing functional capacity to enable both individual and community potential, are core benefits of the local food system.

A number of community projects have brought unused or undervalued land into food production in some way. The Waitati and Warrington community garden groups, WEGgies and WOO are good examples of community members making use of surplus or unused public and private land to develop and create food crops for shared public use. This results in improved 'natural capital' and a net increase in 'human' and 'social capital'¹⁹.

11.7. The Wellbeing Layer

The community gardens, informal raw milk cooperatives, street parties, planting, harvesting and apple pressing efforts, food garden tours, markets, local food stalls and food garden working bees are all examples of food related activities that are more than just evidence of local food in action. They are in fact evidence of economic diversity, where the non-monetised, neighbourhood and on the street, under-the-table and self-employed, consumer cooperatives and self provisioning all support the economic activities that are taken for granted, i.e. the 'real' jobs, career, and formal economic activity. It is also clear that, more than simply propping up the formal economy, these activities draw on and contribute to human, social, cultural and natural capitals as well. Dalziel and Saunders argue, "*Wellbeing is created through persons making time-use choices they judge will contribute to their leading the kinds of lives they value*" (2014, p.27). What they mean by this statement (and other principles) is that "*all human effort serves the same purpose when it creates additional value for wellbeing*" (ibid.). In other words, the exploration in Chapter five of the informal food economy is also an exploration of wellbeing economics.

11.8. Barriers to Uptake

While it is apparent there is a strong desire from some within the community to make local food more widely available and to be a credible substitute for the conventional food system, to date the local consumer support for any pioneering enterprises has been limited. Fruit and vegetable growers have often struggled to be supported by their communities, and as such, are rarely able to maintain a sustainable livelihood from growing and selling food.

We found the lack of financial viability of small-scale food production to be a critical issue when considering local food enterprises. There are a number of reasons for this lack of viability of small-scale food enterprises, as reported by participants.

These are:

- Consumers are often unprepared or unable to pay for the full value of high quality food, and the affordability of food is often the primary motivator of food purchasing decisions.

¹⁹ Human capital is defined as "the level of education in a population" and social capital is defined as "the strength and accessibility of interactive networks between people" in Dalziel and Saunders, 2014, p.46.

- Within the existing conventional food production model there is usually a need to achieve a certain economy of size before growing food becomes profitable, and this has relevance to any food enterprise.
- Small-scale producers often have higher labour and management costs per unit of food produced, particularly if the food producer is also completing the marketing and sales of the food.
- Most consumers fail to recognise the skill, expertise and hard work that is a part of growing good quality food on a small scale.
- Knowledge of food seasonality has become lost for many consumers, leading to an expectation that all food types should be available year-round, and as a result, inconsistently produced (seasonal) food goods are not meeting the needs of many consumers.
- Sporadic support from consumers, which the growers believe is due to consumers' desire for diversity, reliability and consistent supply – all of which are hard to achieve for growers, particularly if the support from consumers is not guaranteed.
- And meat producers have similar challenges in terms of seasonality and a limited ability to utilise the entire carcass, due to consumer preference for only some cuts.

The availability of land for growing food has also been identified as an issue for some respondents. Some aspiring growers discussed the lack of available land, or affordable land, as being a major impediment to the creation of viable small-scale food production enterprises. The capital cost of land has made purchasing land prohibitive for some, and often, corresponding lease agreements are similarly unaffordable. However, during the course of this research it has also become apparent that local options for land to be leased do exist, or for joint venture partnerships to be established between two willing and enthusiastic parties.

The availability of land for growing more diverse food crops is, however, limited by:

- The extent of available land that possesses the correct soils, climate, topography and terrain to grow the desired foods.
- The long-term security of tenure for people wishing to lease the properties.
- The inability for growers leasing land to be able to legally build dwellings on the properties, leading to a need to live off-site.
- And, often poor soil quality, a short growing season and a lack of diversity in food growing options.

All of these apparent challenges have culminated to make small-scale commercial food production an unreliable and difficult means of securing a livelihood in the formal economy. This has resulted in a reduction in the skill base and limited pool of growers, particularly with regard to small scale production, leading to loss of tracts of land that are not being used to their full potential, and loss of a food-growing culture, training and knowledge to encourage young and new growers into the food system. Fortunately, within the informal economy not only are some more cohesive community links being established at the same time, so too is some of the lost cultural capital in the form of specific skills and knowledge in relation not only to

forms of production and processing, but also in terms of informal market arrangements.

There are, too, some existing positive examples of small-scale local food enterprises that have bucked the trend, and are self-supporting enterprises. These provide some insights as to why other enterprises may have not obtained the support they need to become viable. Two of these enterprises are described below.

Roger and Viola Bloc's vegetable and fruit stall at Purakaunui is a small-scale enterprise that receives constant custom from local residents. The Blocs grow salad greens and herbs and trade with other horticultural growers to be able to provide a diverse and consistent range of goods at their roadside stall. Open on Saturday and Sunday mornings, the stall is typically sold out of produce within four to five hours of opening. Consumers who support this enterprise talk of the consistency and diversity of products that are available and the affordability of the produce. Consistent, diverse and affordable: all attributes that grow support.

The second example is Merrell and Alex's Milk Farm, (see case study in section 7.2) Merrell and Alex have a small herd of jersey dairy cows, and provide daily raw, unpasteurised milk to their customers. Supplying people from all over greater Dunedin, this couple have built up a significant and loyal customer base. At times they have used this customer base to raise capital to expand their herd or improve the quality of the farm's pasture. The support for both their product and the underlying operation is evident by the rapid uptake of these opportunities by their customers. Customers are loyal and consistent, and are happy to directly support a farmer who is providing them with products they want. The identifiable attributes of these products are that: the supply is consistent and reliable; it is a protein product that can easily be produced at a home-scale; it has demonstrable health benefits (Perkin, 2007) it is sold at prices that are very competitive with mainstream products; and it is sold on principles of trust, transparency and increased social capital.

11.9. Food Affordability

Food affordability, and the value that people place on food has been a recurring issue raised by people interviewed in this research. Two contrasting opinions have become obvious, and each position is strongly held. For many consumers, food in New Zealand is too expensive and it is highly important that they are able to access food as cheaply as possible. For many food growers, the economic value attached to food does not adequately compensate them for the labour, skills or knowledge attached to producing it.

Affordability relates to absolute cost, but it also relates to income. Making food more affordable can come in two main ways, either through reducing the cost of food directly, or via developing new skills and providing the opportunity for people to be more directly involved in growing food for themselves. Ultimately, accessibility and affordability can be addressed within the context of local food initiatives via the empowerment of individuals through raising their awareness, skills and understanding of what is possible and available in their own locality (Blooms and Hinrichs, 2010). However, for some people who do not have the inclination or time to grow food but are motivated by the underlying values of local food initiatives, local

food enterprises have the potential to meet their values and their needs. However, to ensure the viability of local food enterprises the producers need amongst other things, commitment and loyal support from their customers.

11.10. The Local Food Challenge

While the informal economy appears to offer sustenance to the local food system and large-scale food production within the formal economy is clearly in evidence, the opportunities to create small-medium scale sustainable livelihoods in the Blueskin and Karitane foodshed are not so obvious. A number of disconnects are apparent, each of which disrupts the potential for a viable and resilient local food system to provide an alternative to the existing dominant conventional food system.

Residents in the different settlements within the project area had mixed opinions as to whether a scaled-up local food system is a desirable objective or not. Calls (from some in the community) to grow the local food system were treated with caution by other people who were concerned that some essential values of a local food system might be lost by attaching stronger economic drivers to it. Others who supported greater scale were often motivated by the desire to disrupt the existing conventional food system and to build a credible alternative in its place and were typically driven by goals of community development and community resilience.

Our research has shown that there is significant support for local food but that there is a significant gap between demand for produce and available supply. As such, there appears to be currently insufficient supply or too few local growers growing too few crops to enable the expansion of the local food system, or at least growth of a local food system that meets the desires of a population accustomed to the diversity and wealth of choice present in the conventional food system.

The following two points have been made by respondents in interviews in response to the question of how to increase the availability of local food:

- Ensure demonstrable consistency of demand for products that are priced at a point which recognize the true value of food.
- Increase the level of local supply in a manner which meets consumer needs for convenience, accessibility and reliability.

Moving from ad hoc support of local food enterprises and irregular producer commitment to consistent consumer support of and producer participation in a local food system is critical, to provide both the custom and the produce that will form the solid foundation of a robust local food system.

This push-pull dynamic is a part of the issue food system developers are confronted with when seeking to catalyse alternative food systems.

11.1. Wellbeing as a contested process

The observable and identifiable elements of a local food system show evidence of flexibility and resourcefulness in the local community. All of the intangible cultural capital that is expressed in a sense of place, a practice of caring for public land and

other traditions and values which bind groups in the community together would be a sign of a healthy community in a time of stability and continuity.

In our changing world, however, climate and coastlines are no longer stable and the past is no longer a good guide to the future. We will be required to adapt. The role of local food in strengthening community relationships and building social capital is clearly important to many participants in the local food system already. Taking control of local food systems was seen by many respondents as a way to build social cohesion. For those who are involved in buyers' clubs for raw milk, bulk food and grains, those involved in processing food such as preserves, cheese and butter, those who hunt or gather food and those who produce surplus (such as eggs, vegetables or meat), a strong sense of cohesive community exists. Perhaps here, are the seeds of change.

Chapter 12.

Conclusions

The interest in local food across the Blueskin and Karitane foodshed area is strong, and is matched by the existing expertise and leadership of growers and farmers in the area. However, as this report has flagged, all is not easy. Though there are examples of strong enterprises operating within the foodshed area, there are also many examples of enterprises struggling for success and for the patronage that they require to enable such success. We hope that publication of this report will provide some ideas which will assist the various communities within this foodshed area to progress developing food enterprises that are appropriate to their area and situation.

Making locally grown food accessible and affordable to more people within the settlements across Blueskin and Karitane will take more than several new enterprises however, even appreciating the innovation involved and the passion invoked. As detailed earlier in Chapter Eight, future food system initiatives will ideally be guided by the following **principles**:

1. **Celebrate** the joy and culture of food, the cohesion of community, and the sharing of nutritious, sustaining resources.
2. Continue to **connect community** and **build knowledge** through the **celebration** of growing, harvesting and consuming food.
3. Provide a **supportive environment for local growers**, including a fair living wage and job opportunities, and increase the opportunities for development of local food enterprises of diverse scales.
4. **Enhance supply and distribution systems**, so as to better meet the needs of local communities now and into the future, providing resilience against future impacts.
5. Provide **affordable access** to quality and nutritious local food for all community members.
6. Increase the **diversity of food production**, matched to local needs, and produced in a sustainable manner.
7. Increase awareness of **food provenance, seasonality** and **availability**, connecting food consumers with the producers and the landscape from which it is produced.

These principles point to the development of a 'culture' of local food, which is more soundly rooted in community values than in a mere change in provenance. This is where appreciation of the place of the informal economy in the development and maintenance of a local food system is needed.

The full story of the Blueskin and Karitane Food System cannot all be contained within the covers of this report, and is in fact, still being written with spade, seed and harvest. Two areas of interest, however, remain to be explored in greater depth:

- Development of a local Blueskin food culture to enshrine the principles desired to sustain a local food system would be enabled through a deeper investigation of

Blueskin's history, and in particular, the role of the Waitati flood zone as food basket for Dunedin in our recent past;

- How both the formal and the informal economies function, and how each contributes to social and cultural capital is something to be explored further, to help reinforce the local food 'culture'.

Yet as the participants and community contributors to this report demonstrate, activity within the Blueskin and Karitane Foodshed is vibrant and pulsing. From the small-scale producers who participate in local markets and sell through food retailers, to lifestyle block owners whose livestock provides not only nutrition, but also enriches social networks (barter), to the intensive backyard production in the more closely inhabited residential zones, where vegetable and fruit production, and its transformation into preserves and beverages stocks shelves and pantries, plants and animals alike are integral to the community and its networks. The strength of the conventional food system can not be forgotten, producing large quantities of red meat for the formal food economy via the export market, and in doing so providing significant employment and livelihood opportunities for local people, as well as contributing strongly to the culture of this landscape.

For most consumers within the foodshed area, reliance on the conventional food system is still heavy, even with the existing diversity of local production. In fact, even with the surplus of meat and milk production and the wide diversity of small-scale production, this foodshed is still a significant net importer of food. However, the role of local food in strengthening community relationships and building social capital is clearly important to many participants in the local food system.

Supporting local food systems helps support local, sustainably run farms, can help protect our health and the health of our communities, builds social cohesion, and helps stimulate local economies. We can already see evidence of how true this is from the engagement and participation we've experienced as this research progressed. We hope that this report will help stimulate further growth of food initiatives and enterprises, and contribute to a thriving Blueskin and Karitane food system.

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Appendices

Appendix A: Full Methodology of the Baseline Foodshed Assessment

GIS Spatial Evaluation Of Land Use Across The Project Area, Using Best Available Data Sets

The Agribase land-use dataset was used to spatially evaluate land use across the project area. The Agribase dataset was selected as the most appropriate and reliable dataset for this research, and was purchased fromASUREQuality accordingly.

The Agribase datasets were imported into ArcInfo, a fully featured Geographic Information System (GIS). The datasets overlaid existing topographic information sourced from the publically available Google Earth data. Adjustments were made to the GIS layers, ensuring accuracy of alignment of the two layers.

Data supply specifications

The following data was supplied as part of the purchased Agribase dataset.

Farm identification

Each farm within the study area is allocated an identification character, and has total farm size quantified, and the predominant land use categorised, these are shown in table 14.

Table 14: Farm identification

farm_id	Unique farm identifier assigned by ASUREQuality Limited
size_ha	Total area of the property in hectares as reported by farmer/occupier, rounded to one decimal place
ftype	The predominant land use on the property (refer to the Farm Type lookup in Table 15 below)

Farm type descriptions

Based upon information that the landowner submits to ASUREQuality, each farm is assigned a farm type code. The farm type code represents the predominant land use on that property. The codes are described in table 15.

Table 15: Farm Type Descriptions

Farm Type Code	Description
ALA	Alpaca and/or Llama Breeding
API	Beekeeping and hives
ARA	Arable cropping or seed production

BEF	Beef cattle farming
DAI	Dairy cattle farming
DEE	Deer farming
DOG	Dogs
DRY	Dairy dry stock
EMU	Emu bird farming
FIS	Fish, marine fish farming, hatcheries
FLO	Flowers
FOR	Forestry
FRU	Fruit growing
GOA	Goat farming
GRA	Grazing other people's stock
HOR	Horse farming and breeding
LIF	Lifestyle block
NAT	Native bush
NEW	New record - Unconfirmed farm type
NOF	Not farmed (ie idle land or non-farm use)
NUR	Plant nurseries
OAN	Other livestock (not covered by other types)
OPL	Other planted types (not covered by other types)
OST	Ostrich bird farming
OTH	Enterprises not covered by other classifications
PIG	Pig farming
POU	Poultry farming
SHP	Sheep farming
SNB	Mixed Sheep and beef farming
TOU	Tourism (ie camping ground, motel)
UNS	Unspecified (ie farmer did not give indication)
VEG	Vegetable growing
VIT	Viticulture, grape growing and wine
ZOO	Zoological gardens

Ground-Truthing of Data Set: Ensuring Reliability and Accuracy.

After categorising the Blueskin and Karitane foodshed into various land-use type codes using the Agribase dataset, the project team ground-truthed the initial analysis, ensuring that the land-use type codes generated were accurate. Modifications were made to the GIS data that had been generated, with the foodshed remapped to more accurately represent known land use types. Areas of each land use type were mapped and calculated.

Calculation of Volume of Food Commodities Produced in the Foodshed Area, according to Land Use Classifications

To determine the type and quantity of food being produced in the Blueskin and Karitane foodshed a variety of methods were utilised. These methods followed the precedent set by several studies, including 'The San Francisco Foodshed Assessment' (Thompson et al., 2008) and Blum-Evitt's (2009) review of foodshed assessments.

To calculate the volume of food produced across the Blueskin and Karitane foodshed, the predominant commercial farming systems that are common across this area were used as the basis by which to calculate farm productivity. Advice was taken from local farming consultants, AbacusBio Ltd and PGG Wrightson Ltd, the Ministry for Primary Industries (MPI), as well as from local farmers within the foodshed.

Food productivity data was sourced from a number of sources. For sheep and beef farming, deer farming and dairy farming, the primary reference used was the then Ministry of Agriculture and Forestry's (now Ministry for Primary Industries) 2008 'Pastoral Monitoring Report'. The Pastoral Monitoring report creates 'model farms' which are considered representative of farms in each region of New Zealand.

The sheep and beef model farm methodology draws on 'Meat and Wool New Zealand' sheep and beef data that is collected annually from farmers. A panel of industry specialists then reviews the data, ensuring its accuracy.

The 2011-12 'Dairy New Zealand Statistics' (Dairy NZ, 2012) were the most comprehensive data set used for the dairy productivity calculations, supported by the Pastoral Monitoring Report (MAF, 2008) described above.

The United Nations Food and Agriculture Organisation (FAO) international statistical datasets (FAOSTAT, 2007) were used as comparative benchmarks to validate local production data.

Loss-adjusted primary weights have been used in this analysis, representing the amount of food that is produced given current food handling, storage and processing practices. The primary weights represent the weights of commodity products that have been processed, but still effectively exist in their raw form. These are the measures that are used in New Zealand food industries, and as such are a suitable method for completing the baseline foodshed assessment.

When considering meat products, it is the meat weight that is consumable, and thus removes the inedible parts of an animal, such as bones and offal (though noting that in practice much offal is edible and readily consumed).

Dairy products were analysed in two ways; firstly as milk liquid (raw milk) and secondly as milk solids. Milk solids are the common measure for milk production within the New Zealand dairy industry, and so have been used because of this relevance.

Calculation of Volume of Food Commodities Consumed by the Blueskin Community

To estimate the volume of foods consumed by Blueskin residents, the United Nations Food and Agriculture Organisation (FAO) statistical dataset (FAOSTAT, 2007) was used to provide national dietary consumption figures. This 2007 dataset has previously been used when calculating food ecological footprints (Lawton, 2013) and though it is a top-down method that has limitations of accuracy it is considered the most reliable dataset available. It was acknowledged by Lawton (2013) that there might be inaccuracies in the national data submitted to the FAO because food that is not purchased is excluded and because FAOSTAT (2007) reports the total food consumed in the country for a given year, including by tourists.

Also, it is not clear whether the FAOSTAT data includes food that is commercially grown or all food, including home-grown. There is some suggestion that household food production is on the increase, however the most recent quantitative data for food grown by New Zealand households is from the 1957 census (Statistics NZ, 1957) so they are not helpful for current production. As a result these food figures could be an underestimate depending on the amount of non-commercial food consumed by New Zealanders.

Lawton concluded that while there are a number of gaps in the FAO data which created uncertainties in the Ecological Footprint calculation it remained the data set of choice because the food and drink data are presented as raw (loss-adjusted primary weights) rather than processed food. Using raw foods are the clearest way to calculate footprints. As a result the FAOSTAT data was used in this report for the total food consumed by New Zealanders.

Lawton (2013) highlighted that in a New Zealand context, 94% of the adult population consumes a regular (omnivorous) diet, in which 75% of the food consumed is plant-based and just over 20% is animal-based. The remainder is highly processed and therefore difficult to summarise.

Of course, it is possible that Blueskin and Karitane residents may have different preferences and lifestyles that these national averages do not take into account. To understand whether this is the case, a small amount of typical-case sampling was completed to identify, amongst other things, if differences in habits actually exist. The results showed that 91% of the people in the Blueskin and Karitane communities consume an omnivore diet, 8% a vegetarian diet, and 1% a vegan diet. These results are further explained in the next chapter.

Mass Balance

The 'mass balance' is a way of comparing total production to total consumption only for those items produced in the region. The 'mass balance' comparison does not compare total production with total consumption. As a result, it does not account for items such as bananas or oranges, which are heavily consumed but not possible to grow in this area.

Methods used in the 'San Francisco Foodshed Study' (Thompson et al, 2008) were used to derive this comparison. The mass balance is significant because it

represents a ratio of how much food is consumed for every kilogram produced. The mass balance is derived by dividing the amount of food consumed by the amount of food produced. In addition to the overall mass balance, we compare the weight of commodities produced and the weights consumed for each of the food groups that are applicable to this foodshed. Using these numbers, we can determine where the surpluses and deficits in the Blueskin and Karitane foodshed are.

Research Limitations

This baseline foodshed assessment is underpinned by a combination of purchased data, via the Agribase 2012 dataset; national and international food yield data; and GIS land use analysis. The Agribase data has been collected directly from farmers through voluntary registrations, and is updated annually. This research project acknowledges that with frequent changing of farm/land ownership and lease arrangements it is not possible to have all records current and accurate.

AsureQuality, owners of the Agribase dataset, do not guarantee breadth of coverage of registrations due to the voluntary nature of Agribase registrations, and as such, we acknowledge that recent changes may not be included, and there may be some other errors, duplications or omissions in the data.

This project's process of interviewing stakeholders and using stakeholder networks to analyse the food system has ensured that the data was refined over time, both in terms of the quality of data captured, and also the increasingly fine level of spatial detail captured.

Food production within a food system also includes lifestyle block production, backyard gardens, forest foraging, hunting, fishing, community gardens and urban agriculture. These elements can supply a substantial portion of a household's food source. This project includes such analysis during subsequent stages of this project, but this baseline assessment only evaluates larger commercial food operations that operate within the formal food system.

Appendix B: Full Methodology for Understanding the Informal Food System.

In order to gain a better understanding of food production on lifestyle and residential properties quantitative research methods were utilised. The research methodology is explained below, including how the sample group and size was chosen, the questions asked, how data was collected, the ethical practice of the researchers and the restrictions of the research methodology.

Typical-Case Sampling

A representative sample of data was required to provide more detail to residential and lifestyle block living within the Blueskin and Karitane foodshed.

Characteristically, representative samples resemble the total population with a specific % of +/- a margin of error. Typical-case sampling techniques produce representative samples of data that are purposefully selected due to what are believed to be average cases. Therefore this type of sampling was chosen in order to show typical backyard food production by the average residential and lifestyle block household. Google Earth was used in order to select streets with residential properties (under one hectare) and streets with lifestyle properties (over 2 hectares). In this way one street with residential properties on it was selected and one with lifestyle properties in Karitane and in Purakaunui (two streets in each township). Due to the larger population in Waitati two of each type of street were chosen - for the residential street, one street was chosen in the Waitati township whilst the other was at nearby Doctors Point.

Sample Size

This statistical part of the research study was carefully planned in order to achieve an adequate sample size. Due to time and financial constraints the sample size could not become too large, whilst choosing a sample that would not represent the Blueskin and Karitane residents would also be unacceptable. The combined population of the various settlements is approximately 2,800 living on properties ranging in size from under 1 hectare (2.5 acres, in this section typically referred to as “residential” properties), 2-4 hectares (5 to 10 acres, in this section typically referred to as “small lifestyle” properties) to over 15 hectares (37 acres, in this section typically referred to as “large lifestyle” properties), and then large farms. Data has already been collected from the large farms, as discussed in the previous appendix.

In order to achieve a confidence level of 95% accuracy and with a margin of error of +/- 10 points over the three remaining property classes, there was a need to survey between 93 to 100 participants²⁰. Using the 2013 census which states there are on average 2.5 usual residents per household in the Dunedin area, a total of 40 households in the Blueskin and Karitane area were contacted. Table 16 below shows how this number was calculated.

²⁰ Sample size calculated on 2 different sample size calculators for market research (resolution.research.com and surveymonkey.com).

Table 16: Planned household number to survey

Township	Property size	Street sample	Possible households	Average usual residents per street ²¹	Sample number of residents required ²²	Sample number of households to survey ²³
Karitane	2-4 hectare	Street 1	8	20	12	5
Karitane	> 1 hectare	Street 2	8	20	12	5
Waitati	< 15 hectare	Street 1	8	20	12	5
Waitati	2-4 hectare	Street 2	8	20	12	5
Waitati	> 1 hectare	Street 3	8	20	12	5
Waitati	> 1 hectare	Street 4	8	20	12	5
Purakaunui	< 15 hectare	Street 1	8	20	12	5
Purakaunui	> 1 hectare	Street 2	8	20	12	5
Total		8 streets	64	160	96	40

In order to achieve the required sample size of between 93-100 usual residents, the minimum number of properties to survey was five on eight different streets (12 residents per street divided by the average usual resident of 2.5 equals 4.8 households, which rounded up to a whole house equals five households).

Survey Questions

In order to understand backyard food production a series of questions based around size of growing space and types of food grown were asked. These were as follows:

²¹ The average number of usual residents per household is 2.5 and is based on the 2013 Census data for Dunedin City. Therefore 8 properties with 2.5 usual residents equates to 20 usual residents.

²² If the required sample number of residents is between 93-100 then approximately 12 residents are required from each of the allocated streets.

²³ If 12 residents are required from each street, then the average number of properties to survey is 5 properties on each street.

1. Size of property (standard section, acre, etc.)?
2. Do you grow your own food?
 - a. If **no**: Why do you not grow food?
 - b. If **yes**: How big is your food production area
(size of your garden? size of 2 cars? Approximate metres squared)?
3. Do you grow all year around or is it seasonal?
4. What types of food do you grow on your property?
 - a. Meat [type].....
 - b. Vegetables [greens, root etc]...
 - c. Grains
 - d. Fruit
 - e. Nuts
 - f. Other

The economies of food, whether formal or informal, focus on how food moves around, therefore in order to understand how the informal economy works a series of question pertaining to that were asked. They were as follows:

5. Thinking about the amount of food your family would require for the year, do you grow enough to be...
 - Self-sufficient (in meat, eggs or veg)?
 - Have to supplement from a shop?
 - a. Which shop is the main place you buy meat?
 - b. Which shop is the main place you buy vegetables?
 - Grow lots and have surplus?
 - a. Is surplus seasonal?
 - b. What do you do with it?
 - c. What would you like to do with it?
6. How important is it that you know where your food comes from?

.....

 - a. **If important**: How easy is it for you to buy food you want?
.....
 - b. **If important**: Would you support more local initiatives?
.....

Finally, some general question around the make up of households were asked:

7. How many members in your immediate family?
8. What type of diet do you eat?
 1. Vegan?
 2. Vegetarian?
 3. Omnivore?
 4. Other?

Data Collection

With a view to capturing information from working families as well as stay-at-home families each street was visited twice, once during the day and once in the evening. The exceptions to this were the 'large lifestyle' streets in Waitati and in Purakaunui where the time of the first visit was in the evening and all five households were collected on the first trip. Table 17 shows the actual number of households surveyed.

Table 17: Actual number of households surveyed

Township	Property size	Number of properties actually available	Number of cribs (with no resident households)	Time visited	Number of households surveyed	Total number of residents surveyed
Karitane	Small Lifestyle	6	1	3:15pm 5:30pm	2	6
Karitane	Residential	15	0	2pm 5:30pm	10	24
Waitati	Large Lifestyle	6	0	8pm	5	14
Waitati	Small Lifestyle	8	0	3pm 7:30pm	8	22
Waitati	Residential Dr Point	9	0	12:30pm 6pm	6	10
Waitati	Residential Waitati	7	0	11am 5:30pm	5	14
Purakaunui	Large Lifestyle	9	0	4pm	5	9
Purakaunui	Residential	19	10	9:30am 6:30pm	10	28
Totals		79	11		51	127

Due to using typical-case sampling and identifying streets on Google Earth maps, the actual number of properties that existed differed to what was shown on the map. For example, some of the sections identified on the map as two or more separate sections were in reality one section (such as residential streets in Waitati and Purakaunui). Another anomaly was the mapping and numbering of sections that in actuality were part of much larger commercial farm and had no properties on them (small lifestyle street in Karitane), and another where sections were cribs and had no residents (residential street in Purakaunui).

It is important to note that more than the target numbers of properties were surveyed in order to ensure a good representation of different family types. Out of all the 68 properties available that were not cribs (79 properties minus 11 cribs), 51 households agreed to participate in the survey. Figure 38 shows the number of household surveys from each of the three different property sizes.

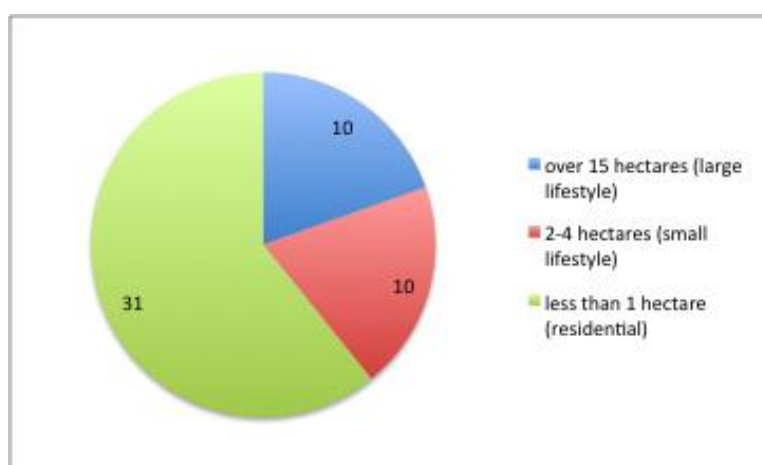


Figure 38: Number of households surveyed from each property size

The results of the surveyed households show that there are 127 usual residents living in those 51 properties, reinforcing the average number of 2.5 residents / household used from the 2013 census data.

Ethical Practice

All household participants surveyed were fully informed of the nature of the project and gave their informed consent. Given the size of project area and the small population from which the samples were drawn, every attempt is made to protect the anonymity of the participants. Documents pertaining to ethics are included as Appendix F and G.

Research Limitations

As previously indicated time restrictions and financial restraints limited the quantitative research, as such each street could only be visited a maximum of two times. The exception to this maximum number of visits was the small lifestyle properties in Waitati which, due to the close proximity to the researchers' main office, were visited 3 times once not enough sample data was returned from the Karitane small lifestyle properties.

Appendix C: Full Methodology for Capturing Community Perceptions

The majority of the empirical data discussed in this report was collected during the period from February 2014 to November 2014. The place-based approach to sustainable community initiatives was considerably helped by the fact that many in the Blueskin and Karitane community have previously worked on or are working on sustainable community initiatives (many of which are outlined in chapter four). The following information explains the planning and implementation methods used to gather qualitative data for the research project.

Appendix D: Qualitative Research Methods Used in this Research

The key influences of this research are explained in the next section. This section focuses on how and why specific research methods were chosen for the qualitative research. Two key approaches to the research were used: a general broad-brush approach and a more targeted, purposeful sampling of participants, as shown in table 18.

Table 18: Two key approaches outlining publicity and sampling

General		Targeted	
Local publicity:		Purposeful sampling of participants:	
Action	Reason	Action	Reason
Regular, monthly articles in the Blueskin News	Broad brush approach to keep public informed	Interviews	Specifically requested interviews with key people
A page on the BRCT website	Detailed information and regular updates	Focus group sessions	Open to everyone and anyone who wanted to share their ideas
BRCT email subscription list	Detailed information and regular updates	Emailed questionnaires	For those who could not be interviewed or attend a focus group session
		Community feedback meetings	Opportunity to gain feedback from the community on the initiatives they proposed and we developed

The methodology and rationale behind these specific engagement methods are detailed below.

Local Publicity

In order to let the communities of the Blueskin and Karitane area know about this research project (prior to and regularly during the project) a range of publicity was generated. The general nature of the publicity was aimed at ensuring residents knew the research was taking place and that we were seeking information and participation from within the community.

The following article was included in the *Blueskin News* in March 2014 and subsequently in the BRCT website (under News) and the BRCT email update (sent to the subscription email list):

“Our Climate Change Planning is coming along in the shape of the Blueskin Food System Assessment (supported by the Lottery Grants Board, Community Research fund). Alongside Ahika Consulting, we will be focusing on and talking to many members of our community who grow their own produce, either for personal or commercial use so we can create a clearer picture of what our current food system looks like. If you are interested in having a chat with us, please contact: office@brct.org.nz / 4822 048.”

Since then BRCT has advertised monthly in the *Blueskin News* and on the BRCT email subscription. The following is another example paragraph update:

“We are exploring the state of our local food system as it stands today, and are gaining a better understanding of what is happening in people’s backyards and farms within the Blueskin area. We are also trying to understand what are the positives and negatives associated with local food production and what changes, if any, could be made to the existing food system to better meet our community’s expectations.”

This method of engagement had the desired effect of keeping the community informed overall about the project; however, no one contacted BRCT in order to participate in the project.

Purposeful Sampling of Participants

Purposeful sampling of interview participants was the choice of methodology for the targeted research. Pamela Maykut and Richard Morehouse (1994) suggest purposeful sampling “*increases the likelihood that variability common in any social phenomenon will be represented in the data*” (p. 45). Purposeful sampling also provides the researcher with “*information-rich*” participants (Patton, 2002, p. 46) that allow a better exploration of significant issues associated with the problem. Information-rich participants provide an opportunity to assimilate issues of importance across the field of research. In this study, purposeful sampling facilitated a deep understanding of particular situations – specifically, the state of our local food system as it stands today and a deeper understanding of what is happening in people’s backyards and farms within the foodshed area. We are also exploring the positives and negatives associated with local food production and what changes, if any, could be made to the existing food system to better meet our community’s expectations. Furthermore, we have endeavoured to be as rigorous as possible in locating and extracting information-rich data from a wide range of informative participants.

Most of the participants in the study are local to the Blueskin and Karitane area, but not all. We went further afield in order to broaden the depth of understanding, specifically in terms of commercial production and distribution. It became apparent during the course of the research that many residents of the Long Beach, Osborne and Purakaunui settlements feel more connected with Port Chalmers than they do with the central township of Blueskin, Waitati. This connection with Port Chalmers is often due to cultural or social reasons, or as commonly, due to a relationship of

convenience. Port Chalmers is a convenient stopover for people travelling between Dunedin City and the settlements of Purakaunui, Osborne and Long Beach. Taking this into account, and cognisant of the fact that Port Chalmers is a much larger settlement, with a comparatively large array of food outlets, it has provided this project team with an opportunity to discuss local food systems with a much wider suitable audience.

The sampling of participants was chosen from four distinct groups pertinent to further understanding the current commercial production and retail within the local food system (commercial production, commercial retail, backyard producers and lifestyle block owners). Semi-structured, in-depth interviews with a number of open-ended questions were conducted with 19 participants, as shown in table 19 below.

Table 19: Number of participants

Sample group	Commercial		Non-commercial		Totals
	Production	Distribution	Backyard	Lifestyle block	
Number of Interviews	9	6	2	2	19
Focus Group (x 3)	4	0	16	12	32
Questionnaires	0	2	6	1	9
Community Workshop (x4)	4 (3 repeats)	2	16 (10 repeats)	7 (5 repeats)	29
Totals	13	10	40	22	89 (minus repeats)

Table 20 (below) shows the number of commercial food operators who were interviewed.

Table 20: Breakdown of commercial food operators

Commercial production:	Commercial distribution:
3 x Sheep and Beef farmers	2 x General Store
4 x Market Gardeners	1 x Supermarket
1 x Apiarist	1 x Hotel/restaurant
1 x Seafood farmer	2 x Café

The total number of people interviewed, attended a group discussion, completed a questionnaire or attended a community workshop was 71 (which is 89 total minus those who attended twice).

Interviews and sample responses

The interview is often seen as a technique for collecting data, yet the qualitative interview approach is a comprehensive investigation that achieves insights into aspects of life and social experiences that construct the participants' worldview. The researcher is the prime instrument of data collection, although the emphasis is on capturing the experiences and meanings of the participants in their own words and in their own situations (Patton, 2002) Thus, the aim of qualitative interviewing is to build a whole picture, from the participants' perspectives, acknowledging interpretations and the construction of the hypotheses by the researcher. The qualitative interview approach used within this study was a semi-structured, in-depth

interview with open-ended questions. In semi-structured interviewing a set of questions, delineating topics and questions, guides the researcher to elicit accounts and meanings, yet also allows freedom to follow subsidiary conversations (Freebody, 2003). This method of gathering data from a real life, interpersonal situation, is based on a purposeful conversation between two people around a common theme (Holstein & Gubrium, 2004). It is important to recognise the influential role of the researcher in a face-to-face interview setting. In this view, *“interviewers are deeply and unavoidably implicated in creating meanings that ostensibly reside within respondents”* (Holstein & Gubrium, 2004, p. 141).

Interviews were conducted at participants’ homes or businesses. See Appendix F for Information Sheet for Participants and Appendix G for the Consent Form for Participants. Interview questions were structured around five key areas:

- Understanding current practices;
- People and their place;
- Positives and negatives,
- Future opportunities, aspirations and change to current local food system;
- Scaling up the local food system.

Interview, focus group and the questionnaire questions were all based on the following, with slight variations to accommodate different practices (such as commercial growing versus backyard growing or commercial distribution versus neighbours giving away excess):

Questions to ‘Understand current practices’:

1. What food do you produce on your property?
2. How much of each item (if more than one) do you produce per year? (Discuss in terms of volume).
3. How much of your own produce do you consume on average?
4. How much do you give away to your friends/family, community, on average?
5. Are there any specific management practices that you currently abide by? (eg. Organics)
6. What are the positive attributes of the existing commercial (mainstream) food system?
7. What are the negative attributes of the existing commercial (mainstream) food system?

Box 1: Sample of interview responses – **Understanding current practices**

Q1. “We are a volume supplier ... We kill 6,000 lambs per year and 100 head of cattle.” Sheep & beef farmer

Q4. “we normally sell eggs to friends regularly; meat, well we are not allowed to give it away. We are allowed homekill, so about one cattle beast a year we do give away. Lamb is more sporadic because not really allowed, so it is only really workers and people living on the property. We do provide it for our Home Stay but we have sworn them all to secrecy because we are not really allowed to.” Sheep & beef farmer

Q6. “Key benefits are consistency, quality of product and delivery, and products available 365 days a year. We have done a good job of taking seasonality out of people’s minds, all year round you can get a good range of products.” Supermarket

Q7. “Problems are when scale leads to mono-culture and separation of systems.” Market gardener

Questions to explore “People and their place”:

1. Regarding food systems, what do you understand as being ‘local’?
2. Do you make your produce available for local sale?
YES: How and where do you sell?
YES: On average, what percentage per year is supplied locally?
NO: Why do you not supply locally?
NO: What are your current markets?
3. Are there local distributors or consumers who would take your produce?
4. What changes would help improve your relationship with your consumers? / How can consumers better support your business?
5. What do you think consumers would prefer or expect of you, as a producer?

Box 2: Sample of interview responses – **People and their place**

Q1. “For us it is New Zealand wide because of the network we have created with the business. We can have it anywhere from New Zealand overnight, 24 hours, we try to focus on immediate local area but it comes back to consistency, delivery and quality – we always have to have it available.” Supermarket

Q2. “No. Our big product is lamb and it’s the volume! I don’t know how we would use 1600 lambs.” Sheep & beef farmer

Q2. “yes but it didn’t work. We charged next to nothing from it, picked bags of greens, the best of the best - \$2/\$3 ... not just for a week but week after week after week and nothing! They rotted! After 2 years we stopped and now people knock on our door for eggs and still people would ask for garlic... we don’t sell garlic.” Retailer

Q4. “Local awareness and lack of awareness of what is available.” Retailer

Q4. “Growing can be fickle.” Market gardener

Q5/6. “If consumers can see the carrots been grown and then see the chemicals that go on to them, that would cause a problem. It is their expectations – does the whole district want to turn up and get rid of gorse for us? So gorse control for us is a problem, there may be a more organic way, but then we have to demand premium for meat. We have a relatively satisfactory way of farming, don’t really want to change it.” Sheep & beef farmer

Questions to understand “Positives and negatives”:

1. In your opinion do you think there is a local food system?
YES: How do you understand it to work?
YES: What are the strengths of the system?
YES: What are the weaknesses of the system?
NO: Why do you not believe there is a local food system?
NO: What would be required in order to create a local food system?
2. What benefits are there to having a local food system?
3. What do you believe are the motivations of consumers who participate in a local food system?
4. What do you believe are the motivations of producers who participate in a local food system?

Box 3: Sample of interview responses – **Positives and negatives**

Q1. “No, I would only see it is a working food system if you could get potatoes, eggs meat, dairy, vegetables, fruit, but not grains, to a substantial amount of people. At the moment it is just a hobby.”
Market gardener

Q1b. “Locally sourced food, it feels good, we buy Evansdale cheese. It’s local, we show off to out-of-town friends, here is our cheese.” Sheep & beef farmer

Q1c. “Probably thing we are weakest on is getting stuff sold ... we don’t have things to sell every week... the local system is not picking up on efficiency of predominant commercial model.” Market gardener

Q2. “Shortness of the food chain ... We are creating a shared knowledge.” Retailer

Q3. “I think because they want to know who is growing their food – trust! ... there is motivation from people to think that money is circulating locally ... more prosperity in our region. Creating jobs and providing people with ways and means – not to raise false expectations but to add something back to local families.” Market gardener

Questions exploring “the future opportunities, aspirations and potential for changes to the existing local food system”:

1. If you were to have aspirations for the current local food system, what would they be?
2. If you were to make changes to the current local food system, what would they be?
3. In the current local food system what barriers exist to achieving your aspirations for its future?
4. What system changes are required for you to supply/increase supply into a local food system?
5. What initiatives within Blueskin/Karitane would aid/enhance the local food system?

Box 4: Sample of interview responses – **Future opportunities, aspirations and changes to current local food system**

Q1. “A better return to those who are doing the growing. The expectation and assumptions about local food is that actually it is going to be cheaper ... it isn't necessarily cheaper – not the way we grow.” Market gardener

Q2. “Intermediary, a representative of a dozen growers, we don't need to know grower. One invoice makes it easier.” Retailer

Q3. “Biggest barrier is consumer understanding the true cost of food.” Retailer/ market gardener

Q4. “We need an abattoir, anyone can do the transport, we need someone between meat company and farmer – just source a good agent.” Sheep & beef farmer

Questions to investigate the potential to “Scale up the local food system”:

1. What benefits might you see from a more scaled local food system? (as a producer eg. Expanded market, meet personal values etc).
2. What benefits might your local community see from a more scaled local food system? – sustainability, economic development, community development, etc.?
3. What barriers exist to enabling a scaled up local food system?

Box 5: Sample of interview responses – **Scaling up the local food system**

Q1. “Financial, social benefits? If doesn't stack up (financially) is it worth it?” Sheep & beef farmer

Q2. “I think there is benefit, decentralisation of food and accountability of farmers. It would change the bigger picture; such as it is not ok to feed cattle palm-kernel. It feeds back so that if a local farmer pollutes the river then people don't want his meat – but if farmer protects the river then people want it.” Sheep & beef farmer

Q3. “Value of food is so low.” Market gardener

Q3. “Loss of productive land.” Market gardener/retailer

Focus group sessions and sample responses

Three focus groups were held with a fourth organised, then rescheduled and eventually cancelled due to lack of participants. The three focus groups were held in Karitane, Waitati and Purakaunui (2nd, 3rd and 4th Sept). The same questions were asked of the focus groups, but in a style of facilitated group engagement.

Box 6: Sample of focus group responses – **Purakaunui Focus Group**

“Grow enough for ourselves. We have a small production but enough to supply ourselves with surplus, it is diverse; we would like to focus on fruit and nut crops eventually. We are not interested in producing more than we can handle.”

“Lots in the art of growing. We can't ignore things when we are growing our own – climate, neighbours – a lot of philosophy of sharing. A lot of people have land but lacking in labour.”

“Have to be prepared to pay a higher price – most people can't grow grains, so have to do something different, grain is labour intensive.”

“Need to mirror the main stream system to make it take off, people want convenience.”

Emailed questionnaires and sample responses

For those who indicated wanting to attend a focus group but couldn't for whatever reason or for those who did not want to attend a focus group but wanted to share their thoughts we created a questionnaire. Two versions of the questionnaire were developed for retailers and for backyard/lifestyle growers. See Appendix H for the structure for questionnaires for backyard growers.

Box 7: Sample of questionnaire responses – **Backyard growers**

Q1b. Vegetables (including legumes) “tomatoes, capsicum, chilli, gherkins, cucumbers egg plant, garlic, onion, spring onion, leek, cabbage, broccoli, cauli, kale, salsify, corn, pop corn, radish, silver beet, spinach, peas (several varieties), beans (mostly climbing varieties, and broad) zucchini, butter nut, pumpkin, basil, mesclun mixes, lettuces, potatoes, carrots, parsnips, beetroot, turnips, celery, fennel, arugula, rocket, bok choy, pak choy, rhubarb, herbs, asparagus ... We dry beans – scarlet runners, broad and blue lake runners – to eat as chilli beans etc... for that bit of extra home grown protein.”

Community workshops

Workshops were held in three communities located within the project area. The objective of the workshops was to continue dialogue about local food systems, and to discuss the various concept enterprises produced as a part of this project.

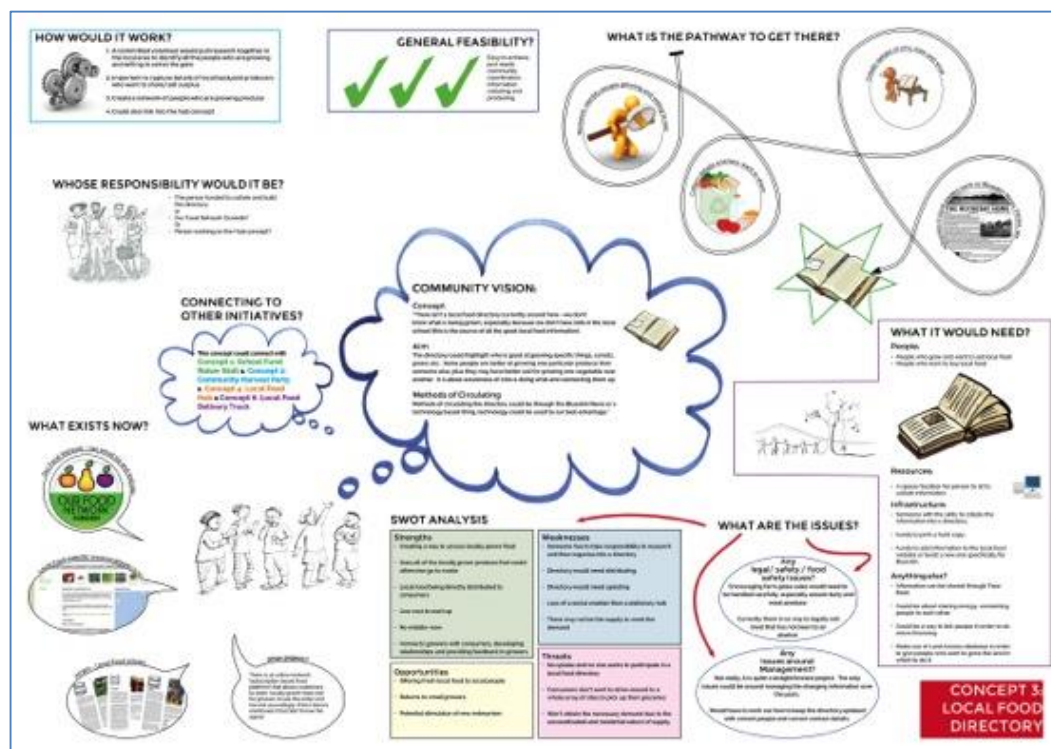


Figure 39: Example A0 sized posters for discussion at the community workshop

Seven concepts were presented as A0 sized posters (similar to figure 39 and discussed in detail in Chapter 7) and were discussed with their merits and failures highlighted.

Ethical Practice

All participants were fully informed of the nature of the project and gave their informed consent. Given the size of the project area, and the small population from which the samples were drawn, every attempt is made to protect the anonymity of the participants. Documents pertaining to ethics are included as Appendix F and G.

Research Limitations

The delimitations of the research revolve around the sample groups of participants that were interviewed. Specifically, we were restricted in the number of individuals who wanted to participate in this research. Many more people were approached for the focus groups but lots could not attend due to time constraints. All of the people who were interested and could not attend were given questionnaires to complete instead but only a small percentage completed them. It is difficult to know why there was not more uptake in terms of completing the questionnaire, it could have been time constraints or that people believed that they were not growing enough so therefore their contribution might not be worthwhile. Alternatively, they did not see worth in participating in this project.

Appendix E: Summarised Community Feedback on Initiatives

Key: Community feedback on strength of enterprises in meeting criteria

	Strong	Average	Weak															
	Celebration of food		Increase community knowledge		Support growers to develop		Enhance supply and distribution		Affordable and accessible		Increased food diversity		Viability / Feasibility		Support /enthusiasm		Achievability	
School Stall	Raises awareness of seasonality of local food amongst kids		Good teaching opportunities for children		Incidental supply only		Additional mechanism to distribute incidental only		Potential to use as a method for providing food in schools		Will not be a strong driver of food diversity		Difficulties with school holidays coinciding with peak growing season		Strong support from most schools		Would need assistance from parents / PTA to help manage it	
Harvest Celebration	A celebration of seasonality and community		Awareness of provenance and seasonality		Will primarily be incidental supply		For seasonal surplus of some crops		Social celebration is priority, providing accessible food		Will not be a strong driver of food diversity		Has been shown to be successful		Depending on the community, support is strong		Requires core community members to provide energy	
Food Directory	Demonstrates the seasonality and availability of food		Demonstrates the seasonality of food		Provides additional markets for growers to supply		A direct method for connecting growers with consumers		Makes more local food accessible and affordable		Growers are stimulated to grow more and diverse food		Requires on going support and maintenance		General support from growers and consumers		Demands small financial resource and ongoing labour	
Local Food Hub	Increases the prevalence of seasonal local food		Increased regularity of community interaction with local food		Provides additional markets for growers to supply		A direct method for connecting growers with consumers		Makes more local food accessible and affordable		Growers are stimulated to grow more and diverse food		Requires ongoing management and oversight.		General support from growers and consumers		Risk that increased scale is required to enable success	
Community Supported Agriculture	Consumers partner with producers to celebrate food		Directly engages consumers in understanding food production		Consumers directly support producers to develop		Provides a strong system to increase supply and distribute efficiently		Makes local food immediately accessible to community members		Growers are stimulated to grow more and diverse food		Requires considerable planning and community leadership, but definitely viable		Support from some growers and consumers, but daunted by process		Considered by some to be unnecessary to meet community needs	
Food delivery truck	Demonstrates the seasonality and availability of food		Increased regularity of community interaction with local food		Provides additional markets for growers to supply		A direct method for connecting growers with consumers		Improves accessibility of food, particularly for those without access to shops		Growers are stimulated to grow more and diverse food		Capital investment and ongoing overheads too large for small scale supply		Support from the more isolated communities		Extensive capital raising, regulation hurdles and concern of viability	
Co-op and Hub	Demonstrates the seasonality and availability of food		Increased regularity of community interaction with local food		Consumers directly support producers to develop		Provides a strong system to increase supply and distribute efficiently		Makes local food immediately accessible to community members		Growers are stimulated to grow more and diverse food		Expensive to develop, significant risk attached to venture, insufficient community population		No support from community members due to the viability risk		Not achievable, given the lack of support from community	

Appendix F: Information Sheet For Participants

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What is the aim of the project?

Through the completion of a Food System Assessment the Blueskin and Karitane communities will better understand the capacity of the area to supply its own food needs in a sustainable way. By understanding community views about the existing food system, as well as aspirations for the future, this project aims to complete a food system assessment for Blueskin and Karitane and in conjunction, to develop a community-led vision for a local Blueskin and Karitane food system.

The project aims to identify, map and understand current food production, distribution and consumption within the Blueskin and Karitane area. It also aims to understand the strengths and weaknesses of the current food system; to understand opportunities to change the existing food system; and of individual's aspirations for a future Blueskin and Karitane food system.

What types of participants are being sought?

The types of participants being sought are Blueskin and Karitane residents who are active participants in the growing, distribution or marketing of food.

What will participants be asked to do?

Should you agree to take part in this project, you will be asked to answer a series of questions regarding your property and / or practices. Each interview may take one to two hours depending on each person.

Please be aware that you may decide not to take part in the project without any disadvantage to yourself of any kind.

Can participants change their mind and withdraw from the project?

You may withdraw from participation in the project at any time and without any disadvantage to yourself of any kind.

What data or information will be collected and what use will be made of it?

Your experiences and opinions will be gathered and used to assist the researchers (Blueskin Resilient Communities Trust and Ahika Consulting) to understand current practices in food production and consumption in the Blueskin and Karitane area, to gain an understanding of the current food system, and of aspirations for a future food system. The results of the project may be published and will be available to members of the public who are interested. However, every attempt will be made to preserve your anonymity. The data collected will be securely stored in such a way that only those named below will be able to gain access to it.

You are most welcome to request a copy of the results of the project should you wish.

What if participants have any questions?

If you have any questions about the project, either now or in the future, please feel free to contact either:

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021 254 8928 | 03 482 2048 | www.brct.org.nz

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Project Manager – Blueskin and Karitane Food System Assessment Project

Director - Ahika Consulting Ltd

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027 3877866 | 03 4779242 | www.ahika.co.nz

Appendix G: Consent Form For Participants

I have read the Information Sheet concerning this project and understand what it is about. All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:

- My participation in the project is entirely voluntary.
- I am free to withdraw from the project at any time without any disadvantage.
- Every attempt will be made to preserve my anonymity, and any data that is personal in nature will not be linked to the other data sets, or used when publishing results.
- Any information that is personal in nature will be destroyed at the conclusion of the project, but any raw data on which the results of the project depend will be retained in secure storage for at least five years.
- The results of the project may be published and made available by the researchers, but every attempt will be made to preserve my anonymity.

.....

(Name of participant)

.....

(Signature of participant)

Appendix H: Questionnaire For Backyard Growers

Through the completion of a Food System Assessment the Blueskin and Karitane communities will better understand the capacity of the area to supply its own food needs in a sustainable way, and in doing so to achieve the four main purposes of sustainable food systems, being the creation of health, wealth, connection and capacity in our communities.

Understanding current practices

1. What type of property do you own (e.g. urban, 2 hectares, 15 hectares)?
2. How much food production space do you use on your property (approx. percentage)?
3. What types of food do you grow on your property? Such as [please give more detail about each type]:
 - a. Meat
 - b. Vegetables (including legumes)
 - c. Grains
 - d. Fruit
 - e. Nuts
 - f. Other
4. Thinking about the amount of food your family would require for the year, approximately what percentage do you produce?
5. How many members in your immediate family?
6. What type of diet do you eat?
7. If you grow excess food, what do you do with it?

People and their place

8. How much of your own produce do you give away to your friends/family, community, on average?
9. Please describe the local community garden – how it works, what you grow and how food is distributed?
10. Regarding food systems, please describe as what you understand as being 'local' and why?
11. What benefits are there to having local food systems?
12. What do you believe are the motivations of consumers who participate in a local food system?
13. What do you believe are the motivations of producers who participate in a local food system?

Positives and negatives

14. In your opinion do you think there is a local Blueskin and Karitane food system?

If YES (please answer these questions):

- a. How do you understand it to work?
- b. What are the strengths of the system?
- c. What are the weaknesses of the system?
- d. If you were to have aspirations for the current local food system, what would they be?
- e. What initiatives within Blueskin / Karitane would aid / enhance the local food system?

- f. Do you think scaling up the local food system could be of benefit?
- g. What benefits might you / your local community see from a more scaled local food system?

If NO (please answer these questions):

- h. Why do you not believe there is a local food system?
- i. What would be required in order to create a local food system?
- j. If you were to have aspirations for a local food system, what would they be?
- k. What initiatives within Blueskin / Karitane would aid the development of a local food system?
- l. What benefits might you / your local community see from a local food system?