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An evaluation of planning frameworks for sustainable
community development in the context of the Peacocke
project, Hamilton

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Katherine Edwards



THE UNIVERSITY OF
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Abstract

Numerous planning frameworks have emerged over the past decades to inform decisions about the design and development of sustainable communities, raising questions about which framework to use within which context. Different frameworks are informed by various definitions and perceptions of what makes a sustainable development and what a 'sustainable community' or development looks like.

This thesis examines and evaluates two sustainability planning frameworks, the food-energy-water nexus (FEW) framework and the Green Star Communities framework, through a case study assessment of the Peacocke development in Hamilton, New Zealand. It asks, what are the diverse perspectives on creating sustainable urban communities in the context of the Peacocke development in Hamilton, and are the FEW nexus and the Green Star frameworks relevant and useful planning tools for sustainable community development in New Zealand? It analyses the potential of these frameworks to shape urban sustainable development and sustainable communities within the context of the Peacocke development.

The case study involved in-depth interviews with planning officials and urban development-focussed community groups about the Peacocke development, and revealed diverse perspectives on meanings of sustainability related to new housing subdivisions. The analysis allowed a comparative assessment of the two sustainable development frameworks and their potential to inform sustainable community design. It highlights the importance of competing framings and values of society related to development and sustainability, imaginaries of sustainable community design, and the importance of strong government regulations.

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Abbreviations

CGI	Community groups and individuals
ELS	Environment Livelihood Security
FEW	Food-energy-water
GBCA	Green Building Council of Australia
GBCSA	Green Building Council of South Africa
GDP	Gross Domestic Product
HCC	Hamilton City Council
HCCO	Hamilton City Council planning officials
HIF	Housing Infrastructure Fund
ICMP	Integrated Catchment Management Plan
RMA	Resource Management Act
SDG	Sustainable Development Goals
SLA	Sustainable Livelihood Approach
NZGBC	New Zealand Green Building Council

Chapter 1: Introduction

Numerous planning frameworks have emerged over the past decades to inform decisions about the design and development of sustainable communities, raising questions about which framework to use within which context. Different frameworks are informed by various definitions and perceptions of what makes a sustainable development and what a 'sustainable community' or development looks like. This thesis examines two of these frameworks, the food-energy-water (FEW) nexus and Green Star Communities framework, and how these frameworks may help to shape urban sustainable development and sustainable communities within the context of the Peacocke development in Hamilton, New Zealand. Using a case study approach alongside the use of qualitative data collection and interviews, diverse perspectives on creating sustainable urban communities among interviews were achieved. These perspectives then assisted in assessing the effectiveness of the planning frameworks.

This chapter, therefore, begins by providing a background to sustainable development frameworks, sustainable community design and urban resource use. It also elaborates on the context of this thesis and provides an overview of the Peacocke development and its significance as a case study in this research. Following this, the main research questions are introduced, a brief explanation of the methodology is provided, and a description of the structure of the thesis is outlined.

Background

Housing developers have the potential to play a key role in adapting to and mitigating climate change by including innovative approaches to their building designs (White, 2015). Such innovation can include the building of 'smart', passive houses and alternative models of living (such as papakainga) which stress the importance of sustainable community living (White, 2015). Larger-scale housing developments, such as the Peacocke development in Hamilton, New Zealand, have the potential to become a sustainable community where collective effort between local government, developers and the community can shape the area to be well-designed in areas of resource efficiency, community living and climate change adaptation.

The global ratification of the United Nations' Sustainable Development Goals (SDGs) in 2015 has seen sustainable development frameworks become a key tool used to monitor and develop SDGs globally (Aboelnga, Khalifa, McNamara, Ribbe, & Sycz, 2018). It is important to consider approaches to reducing local and global carbon footprints at multiple levels, including national, local, district, community and household scales. Consequently, a variety of assessment or rating tools to assess the level of sustainability in new housing developments has been introduced globally in countries such as

Australia, South Africa, Canada, the USA, and others, which has led to a rapid increase in sustainable buildings entering the market (Reed, Wilkinson, Bilos, & Schulte, 2011). These frameworks differ considerably with regards to whether they can be directly compared to other assessment tools, how they operate and what they actually assess (Reed et al., 2011).

Despite urban areas playing a fundamental role in disrupting ecosystems, the concentration of population and consumption in cities and towns has potential for contributing to global sustainability (Haapio, 2012). These benefits include: greater opportunities for waste management and recycling; lower per capita costs of waste and water systems; reduced demand for land; and greater opportunity for reduced car dependency (Haapio, 2012). Governance and planning (if well informed) play a key role in addressing the challenges and opportunities of urbanisation when it comes to sustainability and resource management (Artioli, Acuto, & McArthur, 2017). This can, however, become challenging when multi-scaler food, energy and water systems add substantial complexity to the problem (Romero-Lankao, McPhearson, & Davidson, 2017). Tension also exists between the status quo-oriented functioning of the development industry and the need for innovation for sustainability which is worsened by a lack of adequate legislation from central government and the unwillingness of developers to adapt in the current absence of regulatory requirements (Shearer, Coiacetto, Dodson, & Taygfeld, 2016). Nevertheless, built and urban environments have the potential to shape and influence societal responses to climate change if the political, cultural and economic aspects of power dynamics are considered (Romero-Lankao et al., 2018).

Urban infrastructure and expansion, such as the new Peacocke development, has the potential to become the interface between society and nature by managing the resource flows which influence both social justice and economic development considerations (Monstadt, 2009). It is worthwhile, therefore, to consider what makes for a sustainable urban city and what a 'sustainable community' or development looks like in this context. This thesis examines the issues of urban sustainable community development through a study of the Peacocke development as an example of Hamilton City Council's aim for sustainable community urban development. Using a case study approach alongside the use of qualitative data collection and interviews, diverse perspectives on creating sustainable urban communities among the research participants become evident. These perspectives help to ascertain a planning framework's usefulness and appropriateness as perspectives on what a community should include or look like are a fundamental component of sustainable community design. They also allow for a reflection on the wider systemic views that participants may have about development and what assumptions or discourses are present that underpin development to them. Using the Peacocke development as a case study allowed for a real-life, current and local context for participants to provide perspectives on. Since case study approaches are defined by a bounded system and are a

unique specific case, it allows for, in this instance, an in-depth assessment of the frameworks to be made that are specific to the context of the Peacocke case study (Stake, 2008).

Two frameworks used to guide sustainable development will be assessed to ascertain their relevance in designing, implementing and monitoring a sustainable development through a case study of the Peacocke project. These frameworks are the food-energy-water (FEW) nexus and Green Star. It is important, however, to also examine what some of the key components of a sustainable development or community are.

Urban resource use

Both urban and rural populations face concerns over environmental degradation in addition to the accessibility, affordability and availability of energy and water resources (Scott, Crootof, & Kelly-Richards, 2016). While these differ in many ways and areas, population density is the key component when it comes to influencing and determining the consumption and distribution of resources (Scott et al., 2016). Despite there being greater potential for “efficient resource delivery and use, urban areas also allow for increased consumption and associated waste production” and account for 75 per cent of all GHG emissions (Scott et al., 2016, p. 131). Much of the literature on the sustainability of cities therefore focuses on the entrepreneurship and green innovation of low-carbon (alternative energy) in both transport infrastructure and production and consumption patterns (Affolderbach & Schulz, 2016; McCauley & Stephens, 2012; O'Neill & Gibbs, 2014).

Cities of the future which cater for reduced water and energy use (and therefore reduced CO₂ emissions) are likely to feature increased recycling of heat, materials and water at local, district or city levels (Kenway, 2015). This demonstrates the importance of well-designed cities where regional or local planning, policies and urban blueprints all play their part in contributing towards urban sustainability and efficient resource use and management. It is important, however, to recognize that land owners or occupiers generally only have the potential to save 20 per cent of their water use from the decisions they make (Kenway, 2015). It is also key to consider “the spatial distribution of the water-energy nexus [where] the proximity of humans to a given water source and to sanitation treatment facilities, along with the degree and type of water and sanitation treatment influences energy use and associated costs” (Scott et al., 2016, p. 132). Furthermore, the weight, bulk and quantity of water needed for energy production, agriculture or consumption make it extremely energy intensive and therefore expensive to distribute, store and transport and can be exacerbated by aging and decaying infrastructure (Scott et al., 2016). The more developed a city is, however, the more opportunity there is for resource recycling, and higher population densities can therefore aid in cost-effective recycling and reuse of resource materials (Zhang, 2013).

Household, neighbourhood and regional scales offer very different opportunities for energy and water consumption savings. Regionally, opportunities exist in the form of resource recovery facilities, black water re-use, anaerobic treatment processes and solid waste conversion (Scott et al., 2016). Urban water use can be influenced through various management and urban planning initiatives such as restrictions, pricing and water policies or land-use planning, technology rebates and building design codes for longer and/or short-term impacts (Kenway, 2015). Water and energy utilities also have the potential to influence commercial and residential water use through shower-head replacement programmes or new heating and cooling technologies for the food industries (Larabee & Ashktorab, 2007). On a neighbourhood scale, energy and water saving could occur from various water management and drainage units and water recycling and reuse (Scott et al., 2016). At a household scale, much of the energy-saving comes from the use of selective utilities or devices such as passive cooling and heating, green roofs or the use of grey and black water systems (Scott et al., 2016). However, on a household scale, understanding the water and energy relationships specifically can be complicated. For example, rainwater harvesting tanks are often suggested as a means in which to reduce reliance on external water systems. The “energy use of rainwater tanks is often considered to be around 1.5 kilowatt-hours per cubic meter, whereas [water] systems range from 0.1 to 10 kilowatt-hours per cubic metre” implying that at times rainwater tanks (while saving water) are effectively using more energy (Kenway, 2015, p. 149). The accessibility and availability of food also has a strong influence on the embodied energy and virtual water that is required to distribute, transport and obtain especially since cities are more often than not spatially disconnected from their food resources (Scott et al., 2016). A key factor for food is that transporting food typically relies on petroleum-based fuels, which are, in themselves, energy intensive and large contributors to GHG emissions (Droege, 2011; Moore, Kissinger, & Rees, 2013). These scales should not be looked at in isolation from one another. National, regional or even local governing bodies have the opportunity to enforce or incentivise household level water and/or energy saving technologies, particularly from the outset of new developments. This could be in the form of ensuring, for example, that a new housing or urban precinct has all buildings installed with solar panels as a requirement for the developer.

With regards to climate change drivers and urbanization, the most globally pressing urban issues are resource access (electricity, sanitation, food and water primarily) and exposure to disaster risks and pollutants (Scott et al., 2016). It is crucial however to recognize the context of any given city as access to resources, external influences, governance and political dynamics, environment, climate and social-economic issues will present different limitations and opportunities in each city and/or defined system. Similarly, whilst technology has the potential to improve efficiency, we must be careful not to implement them in a way which fosters and increases vulnerability. To help reduce vulnerability,

decentralized water systems, for example, can be implemented which reduce the overall reliance of energy on water systems (Nair, George, Malano, Arora, & Nawarathna, 2014). Decentralized systems essentially utilize alternative water resources (such as stormwater, wastewater or rainwater) based on a ‘fit for purpose’ idea designed to supply a specific quality and quantity (Cook, Tjandraatmadja, Ho, & Sharma, 2008). These systems, such as water reuse, aquifer recharge, passive water treatment and rainwater harvesting, can be managed independently and have the potential to diversify management opportunities with alternative infrastructure which are inclusive of regenerative and green design principles (Scott et al., 2016). Ultimately, “short-term conservation, reuse and efficiency improvements are needed alongside long-term policies and regulations that support integrated management and resilient systems” (Scott et al., 2016, p. 137; Varbanov, 2014)

Sustainable community design and planning

Tools to assess the environmental performance of buildings have become increasingly popular over the past few decades (Haapio, 2012). These can vary from technical guidelines to lifecycle assessment tools, assessment frameworks, certificates and checklists (Haapio, 2012). While these have undoubtedly played a part in creating more sustainable or passive buildings, this focus on individual buildings is not enough. Services, public transportation, built environments and neighbourhoods can be looked at holistically, particularly due to the rapid increase in urbanisation (Haapio, 2012). In the United States, rural, suburban and city areas each housed one third of the population in the 1960s and by the 1990s suburban areas housed over half of the population (Register, 2006). There are also incentives for governing authorities to support and implement certification processes as sustainable development becomes measurable in terms of achieved criteria or indicators, which allow for urban areas or municipalities to be compared against one another (Tanguay, Rajaonson, Lefebvre, & Lanoie, 2010).

An example of the characteristics of a sustainable community, as defined by the United States Department of Environment Transport and Regions (1998) and elaborated on by Agyeman and Evans (2003) is shown in **Table 1** below.

Table 1. The definition of a sustainable community as per the Department of Environment Transport and Regions (1998) and portrayed by Agyeman, Bullard, and Evans (2010, p. 41)

A sustainable community seeks to	
Protect and enhance the environment	<ul style="list-style-type: none"> • Use energy, water, and other natural resources efficiently and with care • Minimize waste; then reuse or recover it through recycling, composting, or energy recovery; and finally, sustainably dispose of what is left • Limit pollution to levels that do not damage natural systems

	<ul style="list-style-type: none"> • Value and protect the diversity of nature
Meet social needs	<ul style="list-style-type: none"> • Create or enhance places, spaces, and buildings that work well, wear well, and look well • Make settlements human in scale or form • Value and protect diversity and local distinctiveness and strengthen local community and cultural identity • Protect human health and amenity through safe, clean, pleasant environments • Emphasize health service prevention action as well as cure • Ensure access to good food, water, housing, and fuel at reasonable cost • Meet local needs locally wherever possible • Maximize everyone’s access to the skills and knowledge needed to play a full part in society • Empower all sections of the community to participate in decision making, and consider the social and community impacts of decisions
Promote economic success	<ul style="list-style-type: none"> • Create a vibrant local economy that gives access to satisfying and rewarding work without damaging the local, national, or global environment • Value unpaid work • Encourage necessary access to facilities, services, goods, and other people in ways that make less use of the car and minimize impacts on the environment • Make opportunities for culture, leisure, and recreation readily available to all

The idea of social, environmental and economic justice is therefore central to sustainable community development and planning. Through planning, resources are allocated, private and government investments guided towards certain areas rather than others, and decisions on who is involved and how they are decided are made (Haughton G & White, 2019). The choices that planners, officials or developers make can therefore benefit or disadvantage certain groups of peoples. Planning frameworks should, therefore, aid in achieving these above components of a sustainable community and ideally centre economic, environmental and social justices.

Of course, the context of this research within which local or regional development, sustainable or not, takes place is within the realm of New Zealand planning control. Like many other Western countries (such as the UK, Australia and the US), the use of buildings and land is both limited and circumscribed by a capitalist economic system (Kirk, 2018). New Zealand echoes Britain’s pattern of controlling and limiting over-development which stems largely from the private initiatives in development, the private ownership of land and the prevalence of commercial interests for commercial development which are essentially business ventures aimed to make a profit (Kirk, 2018). Applying for planning permission is the primary mechanism through which development control is exercised where such applications are

sent for scrutiny and decision by local planning authorities (such as the Hamilton City Council) whose job it is to oversee plans for the area. These planning authorities then assess the suitability of the development in the context of regulations, neighbouring land uses etc. Government intervention in this process is typically put as 'being in the best public interest', and is usually linked with catchphrases such as 'promoting suitable land use', 'safeguarding the environment' and so on, all of which are notoriously difficult to define (Kirk, 2018). Local planning officials are situated within larger, national tiers of authority or legislative frameworks such as: The Resource Management Act (RMA), Local District Plans, and Building Codes, among others.

An important component to consider here is understanding the social and spatial structures that are at play. Society is generally characterised by inequalities of access to housing, educational opportunity, political power, job conditions and opportunities, wealth security, income and so on (Kirk, 2018; Westergaard & Resler, 1975). These inequalities "have a spatial dimension and manifest themselves very noticeably in the differences in amenities and services available in residential areas" (Kirk, 2018, p. 16). Consider, for example, the quality of schools in certain neighbourhoods, the parking spaces, amounts of traffic, the different standards of housing, the safe areas for children to play, noise level etc. which starkly change between certain suburbs or neighbourhoods of a city. People are therefore "distributed throughout urban areas according to a variety of constraints placed upon them – most importantly, the availability of housing they can afford, and given this, their perceptions of what constitutes a convenient or attractive residential areas" (Kirk, 2018, p. 16). Of course, intersectional inequalities arise here too and individuals are at risk of experiencing further inequalities based on their race, ethnicity, gender, disability or a combination of them. Amenities and services are thus not evenly or equitably distributed across all levels of an urban society. One could argue, therefore, that social policy and land-use planning are needed to redistribute spatial resources, but as recognised in research in the early 1970's:

in some cases the power position of a minority may be reinforced by planning decisions [and so] the effect of this is to double penalise the poor: they get fewer rewards from the economic system anyway; now, in addition, they are further from urban facilities and so may have to pay more to get the same services as the rich (Pahl, 1975, p. 148).

Four decades later, many of the same limitations and issues remain.

Kirk (2018, p. 18) therefore recognises that there are three underlying principles which aid in guiding public intervention in resource allocation:

positive discrimination in favour of groups disadvantaged by the market mechanisms; planning which follows the market and where people's access to facilities is based on their ability to pay; and (or) a reinforcing mechanism where the planned distribution of resources discriminates in favour of those advantaged by the economic system, and hence widens the differentials which already exist.

With regards to this research into the Peacocke development, points ii and iii above are relevant. The role and significance of public intervention is, however, highly contested between those who view it as a desirable diluting and taming of capitalism (to create a 'mixed economy') and those who view it as an enabler for capitalism to grow (thereby sustaining a 'capitalist economy') (Kirk, 2018). A key function of the government is a balancing act between weighing the demands made by various competing interests (typically business and sections of labour) so as to be able to provide a political and economic climate within which businesses can operate profitably (Blackburn, 1967). Despite some scenarios of the opposite, public intervention in the economy is mainly thus enabling a fundamentally capitalist system to continue to operate (Kirk, 2018). Capitalist expansion is, nevertheless, uneven particularly when it comes to who benefits from it, the waste it generates and its plunder of the natural environment – all of which are antithetical to creating sustainable communities (Blackburn, 1967; Kapp, 1978).

Case study

Hamilton city is New Zealand's largest inland city with a population of 160,000 (in 2016), 19% of which is Māori (Hamilton City Council, n.d.-a). It also features New Zealand's longest river, the Waikato river, which flows for 16km through the city. Hamilton has a number of unique attributes including 145 parks and gardens as well as 63 sports areas which contribute towards the cities over 1,000 hectares of open space (Hamilton City Council, n.d.-a). It is also home to various New Zealand science research facilities and is the centre of one of the richest agriculture and pastoral areas in the world (Hamilton City Council, n.d.-a). Hamilton's economy contributes around 3.4% to the national GDP and is one of New Zealand's fastest growing cities.

Due to very high population growth, Hamilton expects to need enough land for an extra 12,500 homes by 2028 and 31,900 by 2038 (Hamilton City Council, 2018b). While this places enormous pressure on the city's infrastructure and the demand for land to meet these needs is evident, it is imperative that these needs are not met through a reinforcement of existing or future social inequalities, food security

and negative water, energy or food trade-offs. Managing these trade-offs and social dynamics will be essential to ensuring that the promises of a 'sustainable community' are in fact being met.

Hamilton City Council (HCC) has subsequently identified and fast-tracked the 720-hectare Peacocke programme (620-hectares to be developed) as a development area to meet the needs of the expanding city. This plan will meet 30% of the projected demand for housing in Hamilton City in the 10-year 2018-2028 period and 25% of the demand over 30 years (Hamilton City Council, 2017). The location of the planned Peacocke community and growth area in relation to Hamilton can be seen in **Figure 1**. Costing the Hamilton city \$290.4 million, this project falls in line with the Council's plan to invest \$2 billion in the 2018-2028 time period to "set the platform for planned, sustainable growth and to look after Hamilton's future transport, infrastructure and community facilities" (Hamilton City Council, 2018a). This project requires commitment to a number of different aspects including: new infrastructure (roads and a bridge which will be the longest and highest, respectively, in the city); new services (water and stormwater services and electrical connections); development of sports parks; updating of planning rules; native fauna and flora protection; and stream restoration. HCC's chief executive Richard Briggs has been quoted as describing the Peacocke project as being "not just our (HCC) biggest investment in growth, it's our biggest environmental investment having 15 hectares of gully restoration, around 30 wetland areas and over 100,000 new native plants" (Our Hamilton, 2019).



Figure 1. The location of the Peacocke development in relation to Hamilton (Hamilton City Council, 2018b).

The Peacocke development will aid in meeting the following objectives set by HCC:

- Becoming the third largest city economy in New Zealand by 2025
- Increasing the amount of developer ready land to meet the National Policy Statement on Urban Development Capacity requirements
- Supporting the provision of affordable housing
- Building a vibrant community that integrates with the rest of Hamilton
- Enabling coordinated strategic infrastructure and land use
- Ensuring financial sustainability for both the HCC and the Community

Peacocke is historically significant due to its low banks along the Waikato River which made it easy for Māori to access land from the river which was also a fruitful place to grow kumara (Hamilton City

Council, n.d.-b). Within Peacocke, there are two pā sites where Māori defensive settlements or villages were located which will be “celebrated, protected and respected” during the development (Hamilton City Council, n.d.-b). More recently, a significant portion of the development area has been farmed for generations by the Peacocke family (hence the current name choice for the development) (Hamilton City Council, n.d.-b).

It is also worth considering the local and national context within which this case study exists. New Zealand “has a centralised unitary system of government in which the central government has given local authorities certain regulatory authority but the activities of local governments are ultimately controlled by government legislation” (Murphy, 2016, p. 2537). There are a number of local and national legislative frameworks, acts and policies that are involved in shaping developments such as these and include:

- The Resource Management Act (RMA)
- The Local Government Act
- The Housing Act
- The Land Transport Act
- The Building Act (which sets that standards for the building codes)
- The Local Area Plan
- The Integrated Catchment Management Plan (ICMP)
- The District Plan
- The Structure Plan

Project funding

Over the 2018-2028 10-year period, the HCC has pledged to spend NZ\$2 billion in the city’s biggest capital programme (Hamilton City Council, n.d.-b). Whilst 90% of the required finances will be self-funded through development contributions and subsidies, funding has also stemmed from the Government’s Housing Infrastructure Fund offering a \$180.3 million 10-year interest free loan as well \$110.1 million infrastructure subsidies from the New Zealand Transport Agency (Hamilton City Council, n.d.-b). This funding will be for key strategic infrastructure needed for the development, namely:

1. A bridge at Cobham Drive and Wairere Drive
2. An extension of Wairere Drive
3. Upgrading the current rural Peacocke Road to an urban road
4. Arterial roading and an intersection at SH3/Dixon Road
5. Land to build the north-south arterial roading within Peacocke

6. A transfer pump station and pressure main (Hamilton City Council, 2017).

The development has also been described as a “ground-breaking example of how well-managed growth can enhance and protect nature”, where “planning for quality, sustainable growth provides an opportunity to support the natural environment” (Hamilton City Council, 2019b). The key environmental investments of the development include over 100,000 new native plants, the removal of weed species, 30 wetland areas, the installation of artificial bat roosts, pest and predator controls, 1.5km of stream restoration and 15 hectares of gully restoration (Hamilton City Council, 2019b). Whilst Peacocke may be the city’s biggest-ever investment in the environment, it would be useful to ascertain what exactly ‘sustainable growth’ for the HCC looks like and what aspects it may or may not include. The environment, largely in terms of gully restoration, is evidently centre-point, but it is not always clear how a ‘sustainable community’ is going to be achieved. Community development has received some attention with former Hamilton Mayor Andrew King quoted as saying “the vision of Peacocke is to enable the development of an attractive and sustainable community” with the development being “more than just housing – it’s a community which enhances our culture, our environment and our social connections. Sustainability is at the heart of our plans for Peacocke” (Hamilton City Council, 2019a). Again, however, it would be worthwhile to understand what a ‘sustainable community’ looks like to both the HCC and the local community groups.

Research questions and objectives

This thesis examines the FEW nexus and the Green Star framework to establish their relevance and potential as planning tools for sustainable community development within New Zealand. The aim is also to understand the diverse perspectives on creating sustainable urban communities particularly among local government officials and members of various community organisations. This research will therefore involve interviews with these actors. Understanding differing perspectives is a key component to ascertaining a planning framework’s usefulness and appropriateness as various perspectives will highlight any social challenges or considerations which may or may not be addressed by a framework.

The two primary research questions for this study are:

- 1) What are the implications of the diverse perspectives on creating sustainable urban communities in the context of the Peacocke development in Hamilton?
- 2) Are the FEW nexus and the Green Star frameworks relevant and useful planning tools for sustainable community development in New Zealand?

The research objectives therefore are:

- To understand and assess how concepts such as ‘sustainable community’ and ‘sustainable development’ are understood by city officials and community organisations, and their implications for sustainable urban development.
- To understand how the Green Star Communities framework has influenced the planning and design of the Peacocke development
- To assess the relevance and applicability of the food-energy-water nexus and the Green Star Communities frameworks in the context of promoting sustainable development in urban New Zealand.

Thesis overview

This chapter has introduced key considerations in sustainable urban development. Firstly, it introduced the FEW nexus and Green Star, which are the two frameworks being examined in this research. They are both explained in more detail in Chapter two where their processes, challenges, critiques and usefulness are discussed. This chapter also introduced the case study for this project, the Peacocke development in Hamilton, New Zealand.

Chapter three not only presents the research approach, direction and methodology of this research but explains how and why the case study approach was used. The chapter goes on to explain how data was collected and analysed and why the specific interviewees were chosen.

Chapters four, five and six present the findings of these interviews. Chapter four discusses the differing perspectives and framings of society and development that were demonstrated by the various interviewees. Here, the different discourses about society and development are identified and examined, including conflicts over ideas, housing design, the role of stakeholders and planning shortfalls. Chapter five imagines a sustainable community, how this can be achieved and the challenges present in sustainable community design. Chapter six evaluates whether the FEW nexus and Green Star framework are appropriate tools with which to achieve this vision.

Chapter seven, the final and concluding chapter, provides a summary of the research. It also identifies the limitations and implications of this research as well as suggested future avenues of research.

Chapter 2: Planning Frameworks for Sustainable Development: A Critical Review

This chapter provides a review of the scholarly literature on the two frameworks being assessed in this research: the FEW nexus and the Green Star Communities framework. For each, a background and history of the framework is given followed by their respective critiques and challenges. It is worth noting that the original sole thesis focus was on the FEW nexus in an attempt to provide insight into how resource trade-offs and interrelationships are currently being identified and considered in the planning phase of large developments such as Peacocke. The FEW nexus was chosen as a key framework because it can be applied at various governing levels, it can work as a sustainable development framework, and it has not been used in the context of New Zealand before. Over the course of this study, however, two factors became evident:

1. The HCC were already using the Green Star Communities framework to guide the planning and design of the Peacocke project, and
2. The FEW nexus was not the best framework to be used in the unique context of the Peacocke project. This was because the nature of the Peacocke project consists of numerous stakeholders and actors each playing their own significant role in designing and shaping the development. For example, I envisioned being able to do a FEW nexus assessment of the Peacocke project as a whole with the system boundaries shown below in **Figure 2**. However, the reality was that while the HCC was able to guide the Peacocke development through Structure Plans¹, the development itself was being carried out by a number of developers who will be designing and building each Peacocke sub-division differently. Each sub-division would therefore ultimately need its own FEW nexus assessment (identified in **Figure 3** with the yellow star indicating where in the original system each developer exists). To further complicate this issue, the Peacocke Structure Plan is yet to be finalised by the HCC so to do a presumptive nexus assessment of either scenario (figure 2 or figure 3) would lead to inconclusive and speculative results.

¹ A structure plan can be defined as “a framework to guide the development or redevelopment of an area by defining the future development and land use patterns, areas of open space, the layout and nature of infrastructure (including transportation links), and other key features and constraints that influence how the effects of development are to be managed.” (Quality Planning, n.d.).

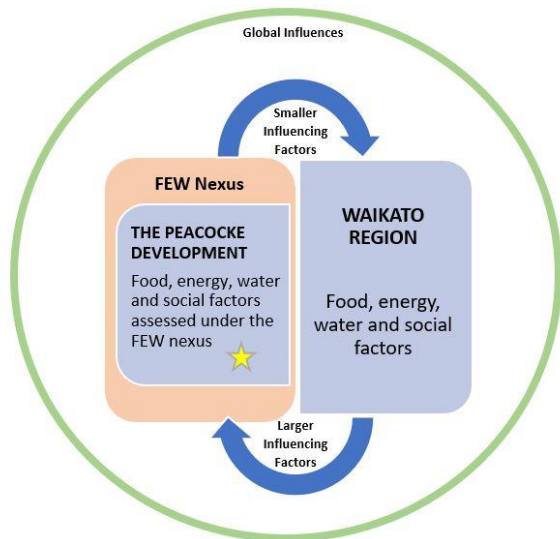


Figure 2. The anticipated FEW nexus system of the Peacocke development

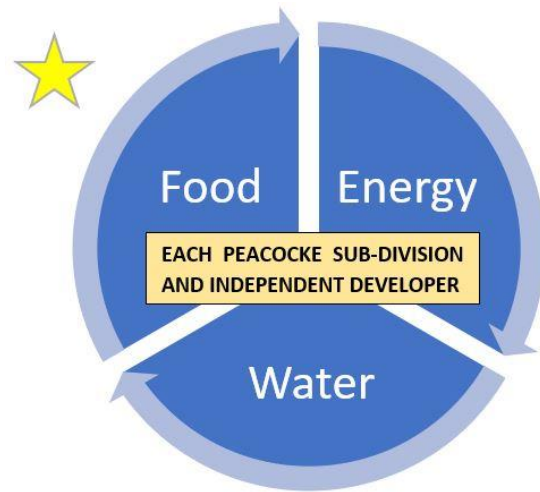


Figure 3. The FEW nexus system of each developer / Peacocke sub-division

As such, reflecting on the data I had collected throughout the research it made sense for the direction and focus of this study to shift towards incorporating Green Star as a key component to the study (alongside the FEW nexus) as well as including an analysis and discussion of the differing discourses at play surrounding sustainable communities, what they mean, how they are achieved and what they look like based on my interviews with community organisations, council officials and other stakeholders.

The Food-Energy-Water nexus

Background, history and evolution of the nexus

Resources such as food, energy and water are crucial for poverty reduction, human well-being and sustainable development (FAO, 2014). However, due to climate change, urbanisation, international trade, mobility, population growth, diversifying diets and economic development, demands for these resources are significantly increasing and placing immense strain on their supply resulting in resource scarcity (FAO, 2014). Drivers such as natural resource degradation and climate change are placing further strain on these already limited natural resources by reducing their ability to provide adequate services (Aboelnga et al., 2018). As such there is an increasing urgency and need to ensure that these land, water and energy resources are able to feed the world's growing population.

Historically, frameworks designed to aid policy-makers in natural resource management have been typically characterised by isolated policy and sectoral approaches (Pittock, Hussey, & McGlennon, 2013). This has led to segmented planning and resources stresses, ultimately undermining the relationships between resource systems and sectors (Pittock et al., 2013). The unintentional

consequences of such policies and frameworks can worsen food, energy and water stressors, social livelihoods and weaken sustainable development initiatives (Bizikova, Roy, Swanson, Venema, & McCandless, 2013). The FEW nexus thus emerged as a framework to better understand how these resources interact and, in turn, how best to minimise and manage their associated environmental impacts (Heard, Miller, Liang, & Xu, 2017). Liu et al. (2017) illustrates the FEW inter-linkages and interactions within the realm of climate and land use change in **Figure 4**.

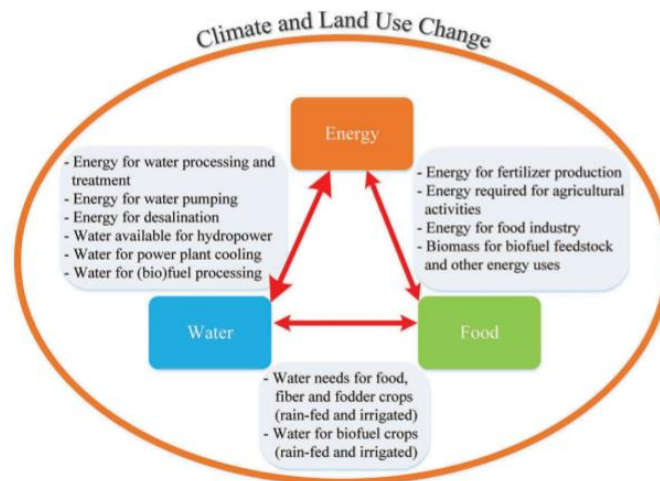


Figure 4. The FEW nexus as identified by Liu et al. (2017)

A focus on the connectivity between resources is not, however, a new phenomenon. Following the food commodity price shock in 2007, these relationships, linkages and trade-offs gained renewed attention due to a number of global food security crises happening at the time (Beddington, 2009). In a 2009 report, Beddington (2009, p. 1) identified the “intrinsic link between the challenge we face to ensure food security... and the need to sustainably manage the world’s rapidly growing demand for energy and water”. Drawing on reports from the International Monetary Fund (IMF), the United Nations Development Programme (UNDP), the Food and Agriculture Organisation (FAO), the International Water Management Institute (IWMI), the Intergovernmental Panel on Climate Change (IPCC) and the World Bank, Beddington recognized that water, food and energy security for the growing global population needs to be tackled alongside climate change concerns (Beddington, 2009). It was, however, the ground-breaking report “*Water Security: The Water-Food-Energy-Climate Nexus*” (World Economic Forum Water Initiative, 2011), which really emphasised the future challenges and relationships between climate, finance, business, people, cities, security, trade, energy, agriculture and water. That same year “*The Water, Energy and Food Security Nexus – Solutions for the Green Economy*” conference in Bonn, Germany (also referred to as the Bonn 2011 conference) was held, which thrust the nexus into the mainstream. As a prelude to the conference, Hoff (2011) published his influential paper titled “*Understanding the Nexus*” and subsequently formalised the first FEW nexus

framework. Here, Hoff (2011) laid the foundations for understanding nexus thinking as a focus on system efficiency and addressing externalities across multiple sectors rather than on the productivity and success of an isolated sector. This FEW nexus framework, designed around available water resources, was thus the first in this field to identify resource interdependencies integrated with global trends.

Since then, numerous organisations, conferences, research or forums have expanded on the framework and used it as an organisational and policy-making concept. Over time, many different versions of the FEW nexus have emerged. Some frameworks, as used by the Nexus Regional Dialogue Programme, for example, include ecosystem and/or the environment functions to be located at the centre of the nexus (termed the WEFN Nexus)(UNEP, 2017). Other versions have a central focus on land use (Howells et al., 2013) or food (Ringler, Bhaduri, & Lawford, 2013). Some scholars, such as Biggs et al. (2015), criticize previous frameworks for failing to recognize and consider livelihoods and the relationships between the natural environment and human populations. As such, they suggest an *Environmental Livelihood Security Nexus* that recognises that sustainable livelihoods are central to achieving successful sustainable development (Biggs et al., 2015).

These variations have, however, also led to different interpretations of why and what the FEW nexus approach is in the first place. Hoff (2011) describes nexus thinking as a focus on overall system efficiency and addressing externalities across the sectors. Allouche, Middleton, and Gyawali (2015), on the other hand, propose a focus on making the interdependencies between the sectors visible through the integrations of the sectors, whilst Dupar and Oates (2012) argue that the nexus is a simple way in which to make clear choices regarding trade-offs in policy (Scott, 2017). Nexus approaches can also be interpreted in terms of the absences or the overlooking of FEW linkages which can lead to incoherent and contradictory policy-making in the creation and application of policies in different sectors (Howells et al., 2013). Importantly, the

nexus approach encourages monetisation of natural resources and ecosystem services to enable the assessment of trade-offs and synergies, but it does not reflect social externalities (e.g. inequalities and human rights) [and so] local priorities and needs may be overlooked by the wider economic and nexus calculus (Scott, 2017, p. 5).

It is key to therefore acknowledge that unless policy and research specifically include a critique of such social inequalities, there is risk that power structures and resources allocations may be reproduced by nexus approaches (Artioli et al., 2017).

The different nexus models are, nevertheless, required and can suit various needs depending on conditions, the issues needing to be addressed and scale (Liu et al., 2017). In order to adequately address and be prepared for challenges arising from increasing global populations, innovative and flexible forms of governance are required (Allouche, Middleton, & Gyawali, 2014). As such, there is no one framework designed to suit the needs and requirements for every circumstance and nor should there be an attempt to make one. Rather, trans-disciplinary and multi-disciplinary approaches coupled with better coordination between researchers, sectors, stakeholders and natural resource managers within nexus studies are needed to accurately assess the trade-offs and synergies involved (Liu et al., 2017).

The role of urban governance

A central component of the FEW nexus approach is that synergies can occur as a result of particular sector policy objectives while others may rely on policy objectives being made in another sector (Weitz, Huber-Lee, Nilsson, Davis, & Hoff, 2014). In general however, public policies are still typically sector-based when it comes to their institutions, goals and objectives (Affolderbach & Schulz, 2016). This harmonising, coordination and alignment of public policies, incentives, regulations and strategies ultimately require governance. This can be understood as “the formal and informal processes and institutions for integrated policy- and decision-making across the FEW sectors” (Scott, 2017, p. 6). The ability for governing organisations to collaborate with each other between sectors and to understand nexus links and resource relationships is key to ensuring effective nexus implementation (Scott, 2017). Both vertical (between levels of government) as well as horizontal (cross-sectoral) coordination is essential for nexus approaches and so it is important to understand these governance and institutional relationships and how they may, or may not be, influenced by political economy factors (Scott, 2017). The various levels of government and political authorities reinforce the economic relevance of cities at a metropolitan and urban level and through national economic development strategies, can identify cities as key area for innovation and economic production (Brenner, 2011; Crouch & Le Galès, 2012). Whilst the nexus trade-offs and synergies are determined by local-level decision-makers, Bréthaut, Gallagher, Dalton, and Allouche (2019, p. 160) note that it is critical to include a variety of meaningful groups to the table to ensure that institutional barriers are most effectively overcome. In further elaboration, merely considering the interrelationships and linkages between resources does not automatically deem the policies to be sustainable or equitable since “while management schemes can appear to be apolitical, their implementation and institutional designs can privilege certain groups over others” (Scott et al., 2016, p. 117).

Though the nexus primarily focuses on ensuring the provision of food, energy and water resources to meet human needs, there is risk that such a focus promotes anthropocentric goals at the expense of

environmental value (Artioli et al., 2017; Flint, Kunze, Muhar, Yoshida, & Penker, 2013). As such, the nexus can be perceived as “a response offered within a capitalist system to ensure the ongoing availability of natural resources” and to therefore not challenge it could be to utilize it as a tool to foster neoliberal policies and current inequalities and power structures (Allouche et al., 2015; Artioli et al., 2017, p. 217). As a result, applying the nexus draws attention to the political dimensions and influences at work.

Critiques and challenges to the framework

While actual implementation of the Nexus as a management tool remains fairly limited, there are also still large gaps in the knowledge and information base of FEW relationships and connections (Liu et al., 2017). Much of the research and literature within the FEW Nexus domain has focused on the need to ensure that the security of a resource in one sector is not compromised when decisions are made in another (Aboelnga et al., 2018; Al-Saidi et al., 2017). The FEW nexus “is also limited by the lack of systematic tools that could address all the trade-offs involved in the nexus” highlighting the need for further research as well as tool and software development for systematic analysis (Liu et al., 2017, p. 1714). Barriers to the implementation of FEW nexus approaches identified throughout the literature include the typically historical system of sector-based and isolated government departments, regulatory mechanisms and policy decision making (Aboelnga et al., 2018; Bizikova et al., 2013; Scott, 2017). Nexus approaches have often only been deemed effective when sectoral, institutional or governmental co-ordinations and relationships are strong and working (Scott, 2017). Additional barriers to successful implementation include:

- A lack of trust and willingness to cooperate across groups of actors belonging to different government levels and disciplines (Aboelnga et al., 2018; Lele, Klousia-Marquis, & Goswami, 2013; Scott, 2017)
- A “lack of clarity about what a ‘successful’ nexus approach looks like in practice and how this can be achieved, monitored and evaluated” (Leck, Conway, Bradshaw, & Rees, 2015, p. 454)
- Unequal distributions of capabilities and power between the sectors (Aboelnga et al., 2018; Bizikova et al., 2013; Conway et al., 2015; Howarth & Monasterolo, 2016; Rasul, 2016; Scott, 2017)
- Differing sectoral and institutional interests and frameworks (Aboelnga et al., 2018; Weitz, Strambo, Kemp-Benedict, & Nilsson, 2017)
- A “lack of communication between the sectors” and challenges integrating knowledge across sciences or sectors due to the use of different languages, focus and concepts (Aboelnga et al.,

2018, p. 12; Bhaduri, Ringler, Dombrowski, Mohtar, & Scheumann, 2015; Leck et al., 2015; Weitz et al., 2017)

- Since nexus approaches typically engage with real-world problems and practitioners, incomplete knowledge or information regarding social or natural systems (coupled with the apparent difficulties in translating the information differently) can be difficult to overcome (Leck et al., 2015)
- The failure to include considerations such as the “political economy in resource allocation, linkages to markets and equitable approaches for negotiating inter-temporal trade-offs” ((Leck et al., 2015, p. 453); see also Allouche et al. (2014)

Systems approaches, such as FEW nexus thinking, have also been critiqued as being under-politicised or inadequately theorised, particularly from relational and historical perspectives (Middleton & Allen, 2014). As more and more actors in the private sector pay attention to and incorporate nexus thinking and resource management, there is a concern and risk that the nexus will be used merely to legitimize and/or re-label business-as-usual agendas rather than actively address issues of sustainability (Leck et al., 2015). Finally, Allouche et al. (2014, p. 23) explain that “food, water and energy have never been conceptually separated in the way that experts have sought to understand them. Indeed, it may be that the WEF nexus is the (re)discovery by experts working in silos of what practicing farmers and fishers already knew”.

Despite these challenges, there are numerous incentives for civil society, businesses or governments to adopt FEW nexus approaches, including minimising the risks and trade-offs of adverse cross-sectoral impacts and improving financial effectiveness and efficiency of development projects by achieving multiple sustainable development goals (Bazilian et al., 2011; Hoff, 2011; Pittock et al., 2013). It is evident that resource management is a fundamental component of achieving sustainable development, so too however is the development and protection of livelihoods and social systems. FEW nexus frameworks should therefore be inclusive of environmental justice considerations and the contextual social systems and dynamics to ensure sustainability is achieved across all spheres and social classes of a society.

The ‘environmental livelihood security’ FEW nexus

Since livelihoods are a fundamental part of sustainable development, utilizing a FEW nexus framework that incorporates a livelihood perspective is a key component of my research. Biggs et al. (2014) suggest a concept termed ‘environmental livelihood security’ (ELS) which accounts for the food, energy and water requirements for livelihoods at multiple institutional levels and spatial scales after identifying synergies between nexus approaches and the development of sustainable livelihoods. ELS

essentially seeks balance between human demand on the environment and natural resource use in order to achieve and promote sustainability (Biggs et al., 2014). As such, an integrated nexus livelihoods framework was developed and adapted by Biggs et al. (2015) to allow for practical implementation of the ELS concept. Whilst many other FEW nexus frameworks fail to incorporate livelihood and/or social aspects, integrating these components can “be effective for promoting equity amongst individuals and communities in local and global development agendas” and thus relevant to the context of this study (Biggs et al., 2015, p. 389).

The Biggs et al. (2015) ELS FEW nexus framework was chosen as the nexus model for this study because of its strong social and environmental justice links. The conceptual framework for exploring ELS combines the key concepts of the FEW-climate nexus with the core elements of the Sustainable Livelihood approaches in an attempt to achieve a sustainable balance between human demand and natural supply (**Figure 5**) (Biggs et al., 2014). Another way to perceive the ELS FEW nexus is in **Figure 6** where the links between food, energy, water and livelihoods are conceptualised and required to balance with each other in order to achieve a sustainable system (Biggs et al., 2015).

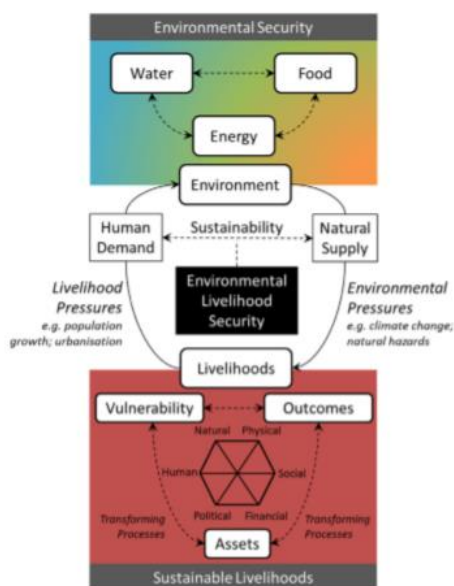


Figure 5. The Environmental Livelihood Security framework as described by Biggs et al. (2015)

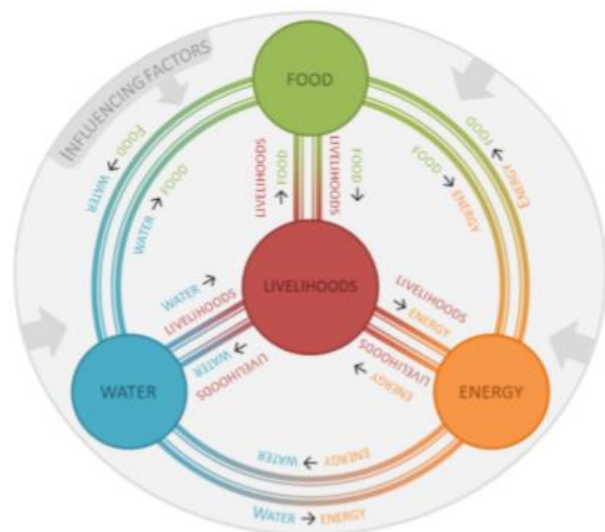


Figure 6. Environmental Livelihood Security linkages and the influence of external factors such as governance, population growth and climate change (Biggs et al., 2015)

The ELS FEW nexus as described by Biggs et al. (2015, p. 396) is a “useful tool for monitoring a system’s progress towards achieving environmental livelihood security”, but it is important to ascertain and evaluate where the FEW interconnections are within the system. Typically, considerations are usually given to individual sectors within a system (i.e., an in-depth analysis of the water sector within a particular system) without much consideration given to the other two or three sectors (Aboelnga et

al., 2018). Identifying which water, energy, food and social elements of any development to look at will help ascertain *where* these synergies and trade-offs in the system are. Synergies generally indicate interactions where “progress in one favours progress in another” whereas trade-offs implies “progress in one which hinders progress in another” (Putra, Pradhan, & Kropp, 2020, p. 2). Synergies can, and should, therefore be leveraged wherever possible while trade-offs can lead to resource insecurities (Cai, Wallington, Shafiee-Jood, & Marston, 2018). Once these aspects and relationships have been identified, they are then plotted into the ELS FEW nexus to deduce overall findings.

External influencing factors also need to be considered and factored in but can be difficult to quantify or accurately determine. The Pacific Islands, for example, are vulnerable to a number of external factors ranging from climatological (droughts or flooding) to meteorological (tropical cyclones) and geophysical (earthquakes) (Deacon, 2012; Forbes, James, Sutherland, & Nichols, 2013). Other external factors, which may need to be described qualitatively, could include international trade, geopolitical conflict and future water pricing (Biggs et al., 2015). Identifying the interactions, synergies and trade-offs between these water, energy, food, social and external influencing factors is a crucial component of the ELS nexus framework being able to provide a holistic perspective of the development. Integrating social livelihood components with those of natural resources contributes towards creating an “integrated and holistic approach to measuring and achieving sustainable development outcomes across multi-scale systems to better-inform policy and development agendas” (Biggs et al., 2015, p. 396).

Green Star

Background

Green Star was launched by the Green Building Council of Australia (GBCA) in 2003 and became the country’s largest voluntary and holistic sustainability rating system for communities, fitouts and buildings (GBCA, n.d.-b). Recognising that the built environment “is the world’s largest contributor to greenhouse gas emissions, it also consumes around a third of our water and generates 40 per cent of our waste”, this framework attempts to address this by improving the wellbeing and health of both the communities and the people, boosting productivity and improving a buildings environmental efficiencies (GBCA, 2020, p. 3). Essentially, it is an internationally recognised sustainability rating system designed with the intention of transforming the way that built environments are designed, constructed and operated (GBCA, 2020). The framework achieves this by (i) contributing to achieving a sustainable economy and market transformation, (ii) protecting and restoring our planet’s ecosystems and biodiversity, (iii) improving our quality of life and health, (iv) minimizing the impact of climate change and, (v) striving for communities and buildings to achieve resilient outcomes (GBCA,

2020, n.d.-b). To become Green Star certified, any project needs to undertake an independent verification process which aims at ensuring that high standards across a variety of sustainability categories have been met. The trademarks of the registration certification have been approved by the Australian Competition and Consumer Commission and so it is important to note that any project outside of Australia seeking Green Star certification will be assessed by these Australian standards although several credits of the Green Star Community tool have been modified to address New Zealand specific requirements.

Key features of what a Green Star-certified project can achieve are identified as (GBCA, 2020, p. 4):

- Lowering operating costs and increasing asset value
- Using 66% less electricity than the average Australian building
- Using 51% less potable water than the average Australian building
- Boosting productivity due to better indoor environments
- Producing 55% fewer greenhouse gas emissions than average Australian buildings
- Improving the health and wellbeing of occupants
- Increasing student learning and engagement
- Speeding up recovery times of hospital patients
- Reducing risk and 'future proof' investments
- Delivering a competitive edge in a crowded marketplace

Although it is a relatively new framework with only 2,500 certifications issued, so far 60,000 people live in Green Star rated apartments; 750,000 people work in Green Star rated offices; 1,300,000 people visit a Green Star rated shopping centre each day; and, among other statistics, such buildings have collectively resulted in a 55% average reduction in emissions (840 million kgCO₂e emissions avoided) (GBCA, 2020). According to GBCA (2020), this is equivalent to avoiding 160,000 passenger vehicles being driven for one year or the annual energy use of 90,690 homes. By the end of 2019, Green Star had certified 1,062 Performances, 963 Design and As Built (the documentation and record drawings showing any deviation to the original design of any given build or project), 286 Interiors and 43 Communities (GBCA, 2019).

There are currently four Green Star rating tools: Design and As Built (used to guide the sustainable design and construction of hospitals, retail centres, public buildings, industrial facilities, universities, offices and schools); Communities (used to improve the sustainability of projects at a community or precinct scale); Interiors (guiding the transformation of interior fitouts); and Performance (aimed at improving the operational efficiency of existing buildings) (GBCA, 2020). From here, each tool uses a rating scale to measure the best practice and sustainability outcomes for any given project. As seen in

Figure 7 below, Green Star Communities, Interiors and Buildings can achieve a 4-6 rated Green Star certification while Green Star Performance can achieve a 1-6-star certification. Once a project team has submitted their required documentation for assessment and review, a Green Star rating is awarded to that particular project.



Figure 7. The Green Star rating scale (GBCA, n.d.-b).

Green Star thus assesses communities, buildings or interiors against a variety of environmental impact categories that align with the SDGs and include looking at all stages of the projects lifecycle from the architectural drawings, to the construction materials, interior paints and furniture and finally, to its efficiency in operation (GBCA, 2020). For *Green Star Buildings*, these are: responsible design, procurement and build; health; resilience; positive contributions; the creation of inclusive spaces; encourages connections between people and nature, green spaces and natural corridors; leadership in innovation; and people and improving the social health of the community (GBCA, 2020). For *Green Star Communities* these categories are: economic prosperity; innovation; liveability; environment; and governance (GBCA, 2020). For *Green Star Performance, Interiors and Design and As Built* these are: best management practices; innovation; emissions; ecology and land use; materials; water; transport; energy; and indoor environment quality (GBCA, 2020).

Since its inception in Australia, other Green Building Councils across the globe have adopted the framework and made it their own. The Green Building Council of South Africa (GBCSA) adopted Green Star in 2008 and have expanded on the system to include a socio-economic category as well as introducing a new zero carbon certification scheme (GBCA, 2019). The GBCSA have subsequently awarded 452 Green Star certifications throughout Africa (GBCA, 2019). In 2007, the New Zealand Green Building Council (NZGBC) introduced Green Star NZ with an expansion into the residential sector with their own rating system for homes called Homestar (GBCA, 2019). The NZGBC have issued 160

Green Star certifications to projects within NZ (as of June 2019)(GBCA, 2019). During my data collection it became evident that the HCC was utilizing the Green Star Communities framework to help guide the Peacocke development. For this reason, an elaboration on only the Communities framework will be given.

Green Star - Communities

Green Star Communities “assesses the planning, design and construction of large-scale development projects at a precinct, neighbourhood and/or community scale” (GBCA, 2016). Since land development and precinct projects are often complex, at times taking years to deliver, certification has been designed to last a maximum of five years after which the project can recertify (GBCA, 2016). This affords projects the opportunity to improve or re-assess their approach as well as being recognized for delivering on-the-ground progress (GBCA, 2016). Recertification will occur under the rating tool with which their previous certification was achieved and will therefore not be held subject to any amendments or clarifications in later tool or framework revisions (GBCA, 2016). Once the development is complete, however, it is certified with a rating for the life of the community. As mentioned, there are five main categories within this framework, which are (GBCA, n.d.-a):

1. **Governance:** The aim here is to recognise and encourage developers within the sector to demonstrate leadership by creating and maintaining strong governance practices. This category promotes industry and community capacity building as well as transparency and engagement while seeking to ensure that community projects are resilient to a changing climate.
2. **Liveability:** This encourages the development of active and healthy lifestyles and rewards communities that demonstrate a high level of inclusiveness, activity and amenity. It recognises developments that are culturally rich, accessible and safe.
3. **Economic prosperity:** This encourages community capacity building, investment in skills development and education and affordable housing and living. It recognises projects that promote productivity and prosperity particularly through emerging opportunities in the digital economy.
4. **Environment:** This category promotes resource efficiency and management by encouraging buildings, transport and infrastructure to have reduced ecological footprints.
5. **Innovation:** this recognizes the application of innovative strategies, procedures and practices that encourage sustainability within the built environment.

For GBCA, a sustainable community “embodies the principles of sustainable development, respecting ecological limits and natural resource constraints, encouraging prosperity and well-being while

optimising conditions for human development” (GBCA, n.d.-a, p. 4). Importantly, the GBCA make clear that this framework is not intended to provide specific strategies or development solutions. Rather it is designed to enable stakeholder engagement during the development, growth and progression of sustainable communities; encourage excellence and innovation in approaches to future community planning; provide national consistencies and a “common language around the definition of best practice sustainable communities”; provide a foundation for continuing and consistent evaluation and assessment of sustainable communities; and “promote integration and collaboration across the spectrum of sustainability issues relating to sustainable communities” (GBCA, n.d.-a, p. 7).

Critiques and challenges to the framework

One of the main challenges to sustainability frameworks and assessments such as Green Star is that they are essentially aiming for a dynamic and moving target. It is challenging to therefore set benchmarks and requisites that need to be met in order to achieve certification when perceptions of sustainability and evolutions of a neighbourhood or community change over time (Komeily & Srinivasan, 2015). For Green Star, since benchmarks are set to Australian standards and legislation, there is therefore risk that while benchmark standards remain static or challenging to change, the goalposts may change overtime. As such, since the Green Star certifications themselves, once issued, last indefinitely, there is the absence of post-certification evaluations thus lacking the ability to respond to changes overtime. Additionally, since Green Star certifications are largely development focused, top-heavy and expert-led, they are at risk of failing to adequately include an assortment of urban stakeholders (Boyle, Michell, & Viruly, 2018). Such frameworks are therefore typically based on criteria defined by urban planners or designers and thus typically ignore local values or knowledge sets (Boyle et al., 2018; Sharifi & Murayama, 2013).

Importantly, it is key to recognize that property development is a business and developers can hope to achieve exposure and measurable publicity should they achieve certification (Rivera, 2009). There is thus a capitalist and market-driven nature to certification tools such as Green Star which raises the following critiques and challenges:

1. There is the risk for developers or government agencies to “chase points and prioritize criteria that offers the most points towards accreditation” (Boyle et al., 2018, p. 8; Komeily & Srinivasan, 2015; Sharifi & Murayama, 2013)
2. Since many Green Star assessments are carried out by developers, their “primary objectives often do not fully correspond with the development of sustainable neighbourhoods” (Berardi, 2013; Boyle et al., 2018, p. 8). Thus using these frameworks can be at risk of becoming a form of ‘greenwashing’ where developments or communities can achieved a ‘sustainability’

accreditation without fully engaging with all aspects of sustainability (Sharifi & Murayama, 2013). “Audit-style assessment processes encourage ‘creative compliance’ which [can] create dysfunctional behaviour [and] mean that a neighbourhood could acquire accreditation without any requirements on the occupants to change their behaviour” (Boyle et al., 2018, p. 8; Garde, 2009; Power, 2000).

3. Due to the increasing demand and market for green-certified neighbourhoods, there has subsequently arisen a premium that has become associated with living in such certified areas (Boyle et al., 2018). Consequently, developers target higher-income groups to be the occupants of these developments leaving poorer performing neighbourhoods to not be considered for the use of such tools (Boyle et al., 2018). “This creates elitist enclaves of sustainable neighbourhoods surrounded by neighbourhoods deprived of similar qualities and privileges” (Boyle et al., 2018, p. 8; Sharifi & Murayama, 2013).
4. The cost associated with expert consultation, application fees and certification mean that many developers, neighbourhoods or government bodies who do not have the funding or resources are likely to avoid utilising such a framework (Boyle et al., 2018; Elgert, 2018; Garde, 2009; Sharifi & Murayama, 2013). This restricts some projects from receiving accreditation that otherwise may have met the criteria or be deemed sustainable (Spinks, 2015).

Many top-down development tools are dominated by the ideology that sustainable development is an outcome rather than a process (Boyle & Michell, 2017). While Green Star Communities does make an attempt to incorporate urban governance into their framework, there is also a risk that it assumes that a sustainable city ought to be governed in a specific way (Elgert, 2018).

Conclusion

This chapter has reviewed the literature on the two key planning frameworks being examined in this study: the (ELS) FEW nexus and the Green Star Communities framework. It also provided the rationale behind choosing each framework for this study. Understanding the role each framework can play in achieving sustainable development as well as the challenges and critiques they hold in application or theory is key to ascertaining the usefulness of the framework within the context of this study.

The following chapter discusses the research methodology used in this research.

Chapter 3: Research Methodology

Sustainable development frameworks and tools are increasingly used to guide planning decisions in the design and monitoring of new housing developments. While there is no record of any infrastructure, property development, environmental or social projects within New Zealand stemming directly from the FEW nexus framework, given its use as a guide for urban development in other country contexts, there is a case to explore its potential usefulness for New Zealand. Similarly, while the Green Star framework continues to gain attention in New Zealand, it is worth considering how this framework may be helping to shape urban sustainable development. There is also a case to examine the similarities and differences between the two frameworks, and their relative strengths and weaknesses. These considerations will be achieved by undertaking a qualitative case study approach. Using interviews to examine the diverse perspectives on creating sustainable urban communities among local government officials, developers and members of various community organisations will help to ascertain a planning framework's usefulness and appropriateness. Perspectives on what a community should include or look like are a fundamental component of sustainable community design. They also allow for a reflection on the wider systemic views that participants may have about development and what assumptions or discourses are present that underpin development to them. As such, this study will assess whether the two abovementioned frameworks are able to achieve the sustainable community visions expressed by the research participants.

This chapter discusses the methodological decisions and processes that underpinned this research. It begins by providing an overview of the research approach followed by an outline of the research questions and objectives. Following this, an explanation for adopting a case study approach and qualitative data collection is given. An overview of the specific data collection methods and the use of discourse analysis is also provided, ending with a summary of the research ethics and chapter as a whole.

Research approach

The Peacocke development in Hamilton will be used as the case study for this research. Case study approaches can be defined as “an empirical enquiry that investigates a contemporary phenomenon in depth and within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident” (Yin, 2009, p. 14). Ultimately, this allows for an in-depth analysis and detailed understanding of the complex nature of a particular place, event or situation (Willis, 2014). Stake (2008, p. 443) goes on to further note that case study research “is defined by interest in an individual case, not by the methods of inquiry used [and that] the object of the study is a specific, unique, bounded system”. As such, the spatial boundaries of this research are the Peacocke

development and Hamilton city (with overarching national legislation taken into consideration) while the temporal boundary is the year 2020, focused on how development frameworks link to the Peacocke development today.

Case study research, such as this, can also be explanatory, descriptive and explorative in nature (Yin, 2009). This therefore suits this research as the Peacocke development is a relevant, current, local and dynamic case study where, combined with wider discourse analysis, will allow for this research to explore various perspectives on sustainable urban community development and the usefulness of the FEW nexus and Green Star frameworks. The Peacocke development is a worthwhile case study as it is a new development that has been positioned (and marketed) to realize some of the housing requirements within Hamilton city. Adopting a qualitative case study approach is therefore a useful way in which to evaluate planning frameworks for sustainable community development in the context of the Peacocke project in Hamilton.

A qualitative approach was chosen for this study due to its method of locating “the observer in the world” where a researcher attempts to interpret or make sense of the meanings people bring to them in their natural setting (Denzin & Lincoln, 2000, p. 3). In contrast to the desire for objective measurement in quantitative research, qualitative research focuses on the collection and study of empirical data obtained through observational studies, interviews and case studies (Denzin & Lincoln, 2000). This research approach suits the study at hand as it allows for the best way in which to approach the complexities of environmental, political, and social sustainability issues.

A key component of qualitative research is the uncovering of themes, understandings, concepts and patterns during data collection, which allows connections to be made between sources and data (Suter, 2012). These connections play a fundamental role in identifying various practices and behaviours at play. During the data collection and interview stage of this research, various themes surrounding sustainable community design, framings of society, conflicts over ideas and housing designs, among others, emerged which have led to being the basis of analysis and discussion in Chapters four and five.

Research questions and objectives

The two primary research questions for this study are:

- 1) What are the implications of the diverse perspectives on creating sustainable urban communities in the context of the Peacocke development in Hamilton?
- 2) Are the FEW nexus and the Green Star frameworks relevant and useful planning tools for sustainable community development in New Zealand?

The research objectives therefore are:

- To understand and assess how concepts such as ‘sustainable community’ and ‘sustainable development’ are understood by city officials and community organisations, and their implications for sustainable urban development.
- To understand how the Green Star Communities framework has influenced the planning and design of the Peacocke development
- To assess the relevance and applicability of the FEW nexus and the Green Star Communities frameworks in the context of promoting sustainable development in urban New Zealand.

Research design

This study uses the case study of the Peacocke development to assess the FEW nexus as described by Biggs et al. (2015) and the Green Star Communities framework and the potential of these to contribute to local and regional sustainability in Hamilton, New Zealand. The FEW nexus was chosen as one of the framework for this study as it “provides a more integrative approach (than other adapted FEW frameworks) to monitoring and evaluating sustainable development across multiple spatial and temporal scales, while still ensuring that a people-centred livelihoods focus remains at its core” (Biggs et al., 2015, p. 395). This framework encompasses the fundamental components of the FEW nexus (the assessment of the relationships and interconnections of the resources), whilst also integrating components of the ELS concept. As such, this specific approach and framework has the potential to contribute to achieving local (or global) targets such as the Sustainable Development Goals (SDGs) in a more equitable and holistic manner whilst also having the capacity to be applied to both larger and smaller scales (Biggs et al., 2015). The Green Star Communities framework was also chosen as it has become a key tool used in the design of the Peacocke project by the HCC. This is a worthwhile framework to include as the five categories of assessment (governance, liveability, economic prosperity, innovation and environment) all play a fundamental part in the design and development of energy efficient and sustainable builds and communities.

The Peacocke case study has involved a review of available documents on the development and an in-depth analysis of semi-structured interviews undertaken with Hamilton City Council officials (HCCO) and various community groups. The first group of research participants, the HCCOs, were chosen as the HCC is actively involved in putting together the structure plan for the Peacocke development. The HCC have also publicly promoted the development as a ‘sustainable community’, and the interviews were a way of gaining insight into what it understood by these claims and how it aimed to achieve a sustainable community. Community groups were chosen as the second group of research participants

as they were able to provide unique and different perspectives on social issues, environmental justice and the development of sustainable communities.

Having these two groups allowed for an evaluation and an in-depth analysis of what sustainable development means in the context of creating a sustainable community, an indication of what the perceived roles and responsibilities of each party are and where there may be common ground or differences between the two when it comes to the common themes, understandings and concepts. Importantly, what became apparent during the interviews is that while HCCOs spoke largely from a local and national legislative standpoint, community groups spoke from a broader system thinking perspective, offering contrasting perspectives reflecting different value sets. This research therefore focuses on the HCC, the Peacocke development, the Green Star framework and the ELS FEW nexus as described by Biggs et al. (2015).

Data collection

Data collection consisted of two stages, each justified and described below:

1) Participant selection and recruitment

As mentioned above, research participants consisted of two groupings: HCCOs and community groups or individuals (CGIs). An internet search into the key HCCOs who have been involved in the Peacocke strategy plan development led me to identify participants from the HCC. I interviewed HCCOs from various departments to ensure I achieved a range of perspectives, insights and values. An internet search also allowed me to identify my key local CGIs, again with the intent of identifying CGIs that focused on different economic, social, environmental or well-being aspects. All participants were contacted via email and sent information about the research, an information sheet and a consent form.

Following this process, interviews were set up with five HCCOs, five community organisations and one independent consultant. To keep anonymity consistent throughout this research each interviewee was allotted an alpha-numeric code to be used when referencing them. These codes were listed alphabetically depending on whether they were either a community group, individual or Hamilton City Council official. However, to give context to their responses and comments a brief description of their department, work or organisation is given in **Table 2** below. Community groups or individuals were given the code "CGI" and then allocated a number depending on their alphabetical ranking, for example, the first three listed community groups or individuals became "CGI1", "CGI2" and "CGI3". Hamilton City Council officials were given the code "HCCO" and then again were listed alphabetically so that the first three will be "CCM1", "CCM2", "CCM3" and so on.

Table 2. The interviewee organisation and their associated code.

CODE	ORGANISATION / DEPARTMENT DESCRIPTION
CGI1	An organisation centred around regenerative housing and community-based living
CGI2	An organisation working with people who have intellectual disabilities
CGI3	An organisation advocating on behalf of the environment
CGI4	An organisation aimed towards fostering belonging and social inclusion
CGI5	An individual practising in the field of sustainable housing
CGI6	An individual who is both a chairperson of CGI3 and has vested interest in the political dynamics of planning
HCCO1	HCC consultant working with the Green Star component to the development
HCCO2	HCC Community and Social Development team member
HCCO3	HCC Sustainability and Environment Advisor in Strategy and Planning
HCCO4	HCC Peacocke project team member
HCCO5	HCC Planner in Economic Growth & Planning

2) Semi-structured interviews

Interviews are typically carried out so that the interviewer can gain information from the interviewee. They are generally “an interchange of views between two or more people on a topic of mutual interest, sees the centrality of human interaction for knowledge production, and emphasizes the social situatedness of research data” (Cohen, Manion, & Morrison, 2017, p. 506). Since they are based on the ability of participants to discuss their understandings and interpretations of the world, they tend to be intersubjective where the data collected needs to be understood within the context of who is asking and answering the questions (Cohen et al., 2017).

Semi-structured interviews, which were chosen as the interview method for this research, allowed for open-ended questions to be asked and tailored for each interviewee. This suited the data collection and interview approach needed for this study as interview questions, while overarchingly all covering similar themes and topics, needed to be tailored between the two research participant groups, between HCCOs departments and the CGIs. Generally, all HCCOs received more-or-less the same interview questions and all CGIs received more-or-less the same interview questions to maintain consistency within each category. HCCOs in a more senior position and overseeing the Peacocke structure plan were, however, asked more specific Peacocke-orientated questions than other HCCOs. Interviews with close project collaborators within the HCCOs allowed conversations to take place regarding the linkages between resources, what sustainable initiatives they are including in the development, how the Green Star framework is guiding their work and what they are hoping to achieve from the development. It was made clear to all participants (particularly to all CGIs) that knowledge of the Peacocke development was not a requirement, but rather their thoughts and

opinions surrounding sustainable community design, socio-economic challenges, community needs, and sustainability concepts were asked.

Semi-structured interviews took place as one-on-one meetings at a venue of their choice, typically their office with the exception of two interviews taking place at a local coffee shop, two interviews at their homes and one interview taking place over Zoom. Interviews ranged between 45 to 75 minutes in length. All interviews were recorded using the voice-recorder application on my mobile phone and later transcribed. At the start of each interview each interviewee was provided a consent form and a copy of the information sheet previously sent to them via email. Utilizing semi-structured interviews also allowed for me to ask further questions or follow up on answers during the interview that may be prompted by the interviewee's answers.

The sample size of my study (11 interviews in total) enabled the identification of key discourses surrounding sustainable development frameworks, sustainable community development and resource use. While these discussions cannot reflect all that is to be said about sustainable community development and framework usage, the themes and discourses discussed were enough to provide an in-depth understanding of the opportunities and challenges present in terms of utilizing the FEW nexus and Green Star framework within the context of the Peacocke development.

Data analysis

While the primary focus of the research was thematic analysis, as defined by Clarke, Braun, Terry, and Hayfield (2019), a discourse analysis defined by Dryzek (2013c) was also used to draw out deeper implications. Data analysis took place in the following two ways:

1) Textual analysis

A desktop analysis of the FEW nexus and Green Star frameworks took place to ensure that both frameworks were well understood. Further desktop work consisted of researching the Peacocke development (mostly utilizing the HCC website) as well as reading documents such as the Hamilton Urban Growth Strategy, the Housing Infrastructure Fund: Detailed Business Case, and the Waikato 10-year District Plan for context.

2) Interview data analysis

As all interviews were recorded, each interview was transcribed shortly after the interview took place to ensure any additional thoughts or comments were recorded and kept together with the transcription notes. During the transcription process key themes were highlighted and over time these similar themes between the interviews were grouped together so that a summary could be easily

made of each theme. Additional key word and phrase searches were done to easily search for and pull-out relevant content pertaining to each theme or topic.

Research ethics

This research was approved by the University of Waikato Human Research Ethics Committee and was undertaken in accordance with the committee's guidelines and procedures. All participating interviewees were provided with verbal and/or written information and opportunities to ask additional questions at any time during the study. They were also provided the opportunity to remain anonymous, review their transcript and pull-out of the study if requested. Written consent was taken prior to undertaking the interviews. All of the interviews were carried out at a time and place convenient to the participants.

Conclusion

This chapter has provided an elaboration of the study's research methods and the justification for utilizing semi-structure interviews and a qualitative methodological approach. Such an approach positioned me to explore the differing perspectives on sustainable community design and the relevance of using the FEW nexus and Green Star frameworks in which to achieve these visions. The following chapter discusses some of the key themes and topics to come out of my research, namely: the different framings of society and development at play; conflicts over ideas; housing design; the role of the developer and planning shortfalls.

Chapter 4: Framings of Society and Development

This chapter identifies and analyses the diverse perspectives on sustainable urban community development (research question one) by assessing how concepts such as ‘sustainable community’ and ‘sustainable development’ were understood by the HCCOs and CGIs. In undertaking the textual analysis of the interviews, dominant environmental discourses were identified (see Dryzek (2013c)).

From the interviews it became evident that there were conflicting framings of society and development by the CGIs and the HCCOs. On the whole, community discourses reflected a critical perspective which challenged the current system at a macro and systemic level. They presented society as framed around capitalism and mechanistic principles, and critiqued both the HCC and the current approach to property development as being too focused on economic aspects. Local government and planning discourses, by contrast, typically reflected a micro lens that focussed on the implications of regulatory institutions and legislation. These conflicting lenses reflected a disconnect between government planning and community acceptance of such plans. The key themes and differences identified in the interviews and elaborated on throughout this chapter are:

- Competing framings of society and development
- Competing values in planning
- Competing values in housing design
- The role of banks, funders, the government and developers, and
- Planning shortfalls and resilience

Competing framings of society and development

Urbanisation has, at times, occurred alongside physical planning and the growth of infrastructure investment (Kirk, 2018). Here the central government undertakes its own development of providing sewage systems, water supply, roads and bridges to complement that of the developers. We see this in the Peacocke development whereby funding from the Housing Infrastructure Fund for infrastructure was a requirement for the development to go forward. These services “are characterised by their large-scale, collective nature, often requiring substantial capital to be invested before any return will be forthcoming” (Kirk, 2018, p. 40). Two arguments can be made here, (i) that the role of the central government is reduced to serving the needs of private capital (Lamarche, 1976), and (ii) that central governments are increasingly using this investment as part of regional policy or physical planning to help determine the location of economic activity, rather than passively reacting to it (Cullingworth, 1972). Both, in this instance, are true. A number of CGIs expressed concern about the ‘handing over of the design of our city’ to developers who tend to typically prioritise profit and miss the mark when it comes to truly meeting the community’s need and addressing social and

economic inequalities (CGI1; CGI3). What is demonstrated in the Peacocke development is that pre-approved funding for the development's infrastructure has both served the interests of private developers and has ultimately helped to shape and guide the structure plan of the development as a whole. The argument that central government's aid in determining the location of future development is evident by various HCCOs discussing how the Peacocke structure plan will help guide development in the area over the next 40-50 years (HCCO1; HCCO4; HCCO5). The structure plan sets the high-level principles for development and the expectations around housing density, where green spaces should be and where roads should go. While it is not a totally fixed and prescriptive document, it sits at a high level using various levers (typically economic ones) and other strategies or documents such as the District Plan to help guide development (HCCO5). So, while CGIs' sentiments may express concern over developers having control of the design of the city, it is, in fact, central government which has played the most influential role in establishing the boundaries and limitations of the developments (at least from an infrastructure standpoint which development now has to be built around).

A recurring theme from the interviews was that current planning discourses are too centred around "Promethean" ideas of continued economic growth (Dryzek, 2013a) HCCO2 notes that while social outcomes are gaining more attention, the HCC were, up until recently, "a lot more focussed on growth, economic and individual economic prosperity". An area where Prometheanism is particularly dominant is within our institutions where "a capitalist economy geared to perpetual economic growth, and a political system whose main task is to facilitate the conditions for that growth" is evident (Dryzek, 2013a, p. 64). Here, a key characteristic of a Promethean discourse is that 'growth is good', which is a shared understanding among political elites or central governments as opposed to the public who are typically more risk averse (Dryzek, 2013a). This risk averse thought is shared by CGI1 and CGI3 who note that such a 'growth is good' attitude centred around increased monetisation, natural resource exploitation, over-consumption and massive waste generation, all of which are unsustainable. So "we need to think about reducing, reusing and lessening our overall impact" which is not typically present in Promethean thinking (CGI1). Murphy (2016, p. 2537) highlights how even the RMA, where local councils are responsible for regulating land use activities through their own district plans, are essentially "designed to simplify and speed up the planning process, with the ultimate goal of promoting economic growth and positive employment outcomes".

The Promethean discourse also reflects a particular human-nature relationship whereby there is denial of environmental limits and confidence in the ability of humans and technology to control nature (Dryzek, 2013a). Historically, particularly in the 'West' in the nineteenth century, during the industrialisation period, nature came to be represented as being subdued and needing to be controlled (Macnaghten & Urry, 1997). At the time, and still present in Promethean thinking today,

“modernity involved the belief that human progress should be measured and evaluated in terms of the domination of nature, rather than through any attempt to transform the relationship between humans and nature” (Macnaghten & Urry, 1997, p. 7). This discourse became apparent in the interview with CGI1, CGI2 and CGI3 who noted that the idea that humans have control over nature needs to be re-shaped and re-learned so that we learn to live with and alongside nature rather than managing and controlling it. To take this further, in the opinion of CGI1, specific metaphors or framings of society and people’s place within it, such as ‘people being cogs in a machine’, run the risk of being too minimalistic and reductionist which foster and perpetuate the exploitative nature of capitalist and Promethean workings. These mechanistic paradigms of people, nature and resources and the relationships between the three in turn continue to generate the social problems, inequalities, disconnect and resource exploitation that we see today (CGI1). Macnaghten and Urry (1997, p. 7) echo this idea by noting that “the dichotomisation (of man and nature) has led to exceptional levels of exploitation and degradation of land and landscapes”. Furthermore, Dryzek (2013a) notes that critiques of the Promethean discourse include its lack of recognition that economic growth coincides with increased resource depletion, congestion and pollution.

Another discourse frequently alluded to in the interviews is that of economic rationalism and the importance of the market. HCCO2 acknowledged that “the central government has believed that the market will dictate what is right and so that has kind of led to a lot of making sure that the council cannot be a bureaucratic stoppage to development”. This was echoed by HCCO4 who explained that the HCC is currently trying to identify what the market wants to do in terms of housing. Market discourses are often discussed under different terms: free-market conservatism, neoliberalism, classical liberalism or market liberalism (Dryzek, 2013b). Economic rationalism “may be defined by its commitment to the intelligent deployment of market mechanisms to achieve public ends... [where] forces of the marketplace [can be] powerful tools for changing individual and institutional behaviour” (Dryzek, 2013b, p. 123). Market-led discourse in development prioritises the role of business and transaction which risks pricing many people out of the system leading to social inequalities (CGI3). HCCO1 indicated that the justification for energy-efficient and sustainable developments (not within Peacocke) are purely to achieve a market advantage where sections could be sold for as high a price as possible rather than an actual incentive to development sustainable housing for any other reason. HCCO4 goes on, however, to note that the “current district plan currently does not dis-allow alternative housing models to be developed but the problem is that nobody is making that happen and so it comes down to what does the market want to do?” They state further that “developers will always respond to what’s going to sell and if the market shifts and people want to buy that sort of product (a more energy efficient and sustainable home) then I’m sure the developers will support

rules that will put that in place". These two statements touch on the fact that even legislative requirements are largely influenced by market forces. It was, therefore, also recognised that one of the primary limitations to implementing sustainability initiatives is the market itself and the need to push the market towards supporting options other than business-as-usual (CGI3; HCCO4). Due to growth being imperative to the typical market in a capitalist system, CGI3 and CGI6 also critique the market for being an unsustainable basis on which to base our economy and livelihoods.

Competing values in planning

It became evident throughout the interviews that without clear regulation, environmental and sustainable considerations are at risk of being ignored. This is particularly evident in comments about community gardens. CGI3 noted that while they felt as though the Hamilton community has strongly wanted food aspects (such as community gardens or fruit trees) to be included in the Peacocke development, that both the HCC and the developers do not seem to take these ideas seriously once they realise it starts to eat into their profit margins. These ideas then fall into the trap of becoming a 'nice to have' rather than a necessity to the development. According to Holland (2004), planning for sustainability should require the integration of economic, environmental and social concerns. Community gardens can be a means by which to create useful, high quality, attractive and sustainable public spaces which cater to the diverse needs of a community (Holland, 2004). Urban agriculture, or community gardens, "will provide a source of food close to where people live, with the effect of reducing food miles, thus having environment benefits, and providing a further source of employment, and so delivering economic benefits too" (DeKay, 1997; Holland, 2004, p. 290).

Of course, community gardens cannot solve all social or food deprivations and needs within a community (Holland, 2004). CGI6 also reiterated some concerns around community gardens by noting that they are most beneficial for people who are in rental properties or apartments and thus have no land. Thus, low density housing suburbs where everyone has the opportunity to utilize their own garden space are unlikely to have residents reliant on community gardens (CGI6). And so, while the HCC in principle may support or encourage the community garden space, they need to be considered within the context of who will be utilising the garden resource, whether there will even be a need for one in any given neighbourhood as well as who will take on the ownership and maintenance of the space. HCCO2, HCCO3, HCCO4 and HCCO5 noted that while community gardens are allowed in Peacocke in theory, they should be managed and run by community facility groups as they can typically fail quickly should there not be a strong kaitiaki or guardianship and ownership of them. Holland (2004, p. 285) also recognises the importance of this by stating that "community gardens are open spaces managed and operated by members of the local community for a variety of purposes".

There is thus a need to establish what central government's role is in implementing or encouraging the inclusion of 'nice to have's' that are not a legislative requirement. We see here the community hoping that the HCC and developers include community gardens in their plans. Concurrently, HCCO2 highlighted the difficulties in implementing community gardens from the top-down by saying "I think it's a waste of time if it's me that has to tell you that you should be doing it. I'm a fan of public space orchards, and we could play a role in having fruit trees in public spaces, but I don't know if council are growers of vegetables". HCCO2 also noted that one of the biggest obstacles to having fruit trees is the maintenance and social issues that they bring such as the presence of rats and the risk that people may throw fruit at each other. Additionally, for Green Star Communities accreditation criteria needs to be met in terms of access to fresh food which HCCO5 explains simply means access to a supermarket. There is thus little to no legislative requirement that allows for such social, environmental and economic considerations to be included in development.

The same sentiments apply when looking at the protection of important natural ecosystems. In instances where a portion of the development encroaches into the territory of endangered pekapeka bats, questions were raised by the CGIs as to what the development or particular suburb would look like if the well-being of the bats were integrated into the design of the community. This could be done in a way that properties are required to have bat houses on the property or that from the on-set people moving into the area are taught about why their neighbourhood is important and how and why they should care for it (CGI6). This has a number of benefits: firstly, by not just sustaining the bats well-being but improving it; secondly, by fostering a sense of community and place amongst the residents moving in; and thirdly, educating the community about their surroundings. By not valuing, protecting or prioritising the surrounding natural resources, companies, farmers or local residents take the risk that they can get away with polluting and destroying them (CGI6). To the HCC, this conflict between biodiversity and urban development can, at times, be a barrier to get over where one area of government is saying 'more houses, more houses' and another saying 'stop the houses we want to protect the bats' (HCCO4). So, while the HCC is still trying to navigate these conflicting legislations and priorities in Peacocke, HCCO4 did note that longer-term spatial planning has helped. There, therefore, needs to be a "convergence of ecological sustainability and social justice so that policy is influenced in more holistic ways" (Holland, 2004).

Competing values in housing design

A strong theme that emerged from interviews with the CGIs was that housing needs to be better designed to cater for the differing needs of the community. Such designs should be inclusive of considerations for better insulation, improved energy and water use, disabilities, age, family size, affordability and intergenerational living. CGI2 notes that while "we're not saying every house has to

meet a certain persons changing needs overtime, we [need] to try and make sure that houses meet most people's needs". The current status quo of building for an able-bodied family of four is not an accurate representation of the community demographic and so housing should better cater for the diverse family and individual needs. It is important to note that structural solutions and better designed houses "are more effective than individual action and are likely to reduce socio-economic inequalities in the determinants of health" (Graham, 2007; Howden-Chapman, Crane, Chapman, & Fougere, 2011, p. 587). Howden-Chapman (2004) identifies the following components of housing that can affect the physical and mental health of its inhabitants: the physical structure of the house; seasonal differences; the indoor environment; noise pollution; household crowding; damp and mould; multiple housing deprivation (having poor housing over the course of a lifetime); housing tenure; housing discrimination; and, housing wealth among others. The home should be a place of nurture, rest, love and restructure and yet, for the majority of New Zealanders, their home is where they are going to get sick and develop asthma, respiratory illness, rheumatic fever or coughs and colds (CGI5). The design of houses should therefore not be undervalued as the poor design, performance and quality of both new and old housing in New Zealand has had an incredibly negative impact on the health of New Zealanders (CGI5).

The lack of diverse housing options that cater for people with different needs naturally generates social inequalities and continues to provide fewer housing options for a vast majority of the population, particularly the disabled. CGI2 notes that most houses are typically designed for three to four physically-abled people. According to CGI6, nine out of 10 houses should be an accessible build as it allows for the greatest number of people who are able to use it for a longer period of time. Furthermore, many houses are not designed to LifeMark standards, which is a framework with which to design, build and assess a home to ensure it suits the needs of young to old individuals, where considerations such as wider doorframes or corridors to allow for crutches or wheelchairs are taken into account. In fact, for CGI2, who deals with clients who are both physically and mentally disabled, they have had to create and implement their own housing frameworks, assessments and technologies to ensure that they have more energy efficient and healthier homes as the nature of the people they support depend on having healthy, accessible and alternatively designed houses. HCCO5 acknowledges, though, that the LifeMark framework can be brought into the Peacocke Structure Plan but it becomes difficult when trying to force developers to develop with that framework at the core of their house design. Currently, levers could be pulled which incentivise this behaviour through a reduction in rates or development contributions, for example, but it is something outside of the current District Plan (HCCO5). This reiterates the notion that developers will typically only react and implement alternatively designed houses when there is an economic incentive for them to do so.

When it comes to affordability, recommendations within the Structure Plan (which has not been finalised, so these are speculative figures based on comments made in the HIF Detailed Business Case Report) call for developers to make contributions to affordable housing by developing 10% of the houses at 65% of the mean dwelling price of the city in which they are located (Hamilton City Council, 2017). However, this provides “no guarantee that the units will be affordable and there is no mechanism for ensuring that they remain affordable” and is also not a regulatory requirement for developers to achieve (Murphy, 2016, p. 2542). Affordability and accessibility for ageing populations should be a key consideration in house design. Intergenerational living is also poorly catered for, which plays a key role in community development and resilience through the transfer of knowledge across generations (CGI4). It also should be worth recognising that “having affordable housing (either through Community Land Trust, social housing, co-housing or other alternative models) adds life to the economy as people can subsequently afford to spend more money on supporting local business rather than buying cheap products from multi-national franchises” (CGI1). This leads to the regeneration of the community, keeps money local, fosters a sense of belonging, agency or capability and raises their ability to make mindful and conscious decisions, all of which increase both the overall value of their life as well as everything around them (CGI1). Such considerations are not fundamentally difficult or unattainable, it is simply thinking about those things and the different needs of different people. In terms of affordability, HCCO4 notes that while it is difficult to know the expected house prices in 2023, houses within the Peacocke development overlooking the Waikato River are expected to reach roughly \$1 million. While this is by no means ‘affordable’, the Business Case for the development aimed at achieving 10% affordable housing, but there is no obligation for developers to meet this mark (HCCO4). HCCO2 notes that “in Hamilton, under 50% of the population own their own homes, so affordability has to be in both renting and purchasing in which case you need to have smaller, bigger, the different and the LifeMark designs which all help to address affordability”. In an attempt to aid in achieving these goals through economic incentives such as reduced development contributions, the District Plan is likely to have maximum lot sizes to encourage smaller section sizes and higher density (HCCO4). Community Land Trusts are, however, another opportunity where affordability can be met (HCCO4).

Certain types of housing seem to be ‘locked in’, limiting the innovation that is required for sustainable house design. There is a tendency from building officials, building inspectors, building consent processors, builders etc. to continue with the status quo who just want to know that their job is safe once all the assessment papers are ticked (CGI5). This demonstrates a lack of interest in innovation or improvement and an attitude from the industry that says ‘I sold this house last year so I can sell it again this year because we do not really need to innovate - why would we change the thing that makes

us money?’ (CGI5). CGI5 also finds that there is a lack of political will when it comes to reforming the housing industry to improve the Building Performance Index (BPI) standards which would force designers to think differently and improve their work. Similarly, CGI5 finds that most people are not interested in investing in better performing or passive homes because they don't want to spend the extra money implementing rainwater tanks or retro-fit houses with eco-friendlier options when there is no market demand for them to do so. As mentioned above, perhaps if houses were better designed for an individual’s changing needs over time, people could envision themselves staying in a home for longer and consequently will have an incentive to seek better performing homes. Importantly, there needs to be better opportunities to innovate, and legislation should be designed to push us towards innovation (both within the building industry and for the people buying in to homes). Currently, CGI5 has found that the industry is conservative, restrictive, not innovative, it is business as usual and you will have to fight against the system, which is what he has come to accept. HCCO4 acknowledged that “because we are council, we cannot say that all developers need to have Green Star sections but the developer might choose to enter into a Green Star community framework and then sell it like that and so it is the developer who holds the control over whether he or she wants those sorts of things to happen” (such as having passive house designs).

A final demonstration of the competing values in housing design is the lack of will from the public to see the long-term value of having energy-passive homes. HCCO5 notes that most people only see the cost of actually purchasing a house, and puts this down to education and the need to recognise that while an extra \$10-15,000 may be needed now, money will be saved in the long-term (HCCO5). However, as houses are already expensive, the current housing climate and context make it difficult for people to understand that. This is worsened both by the poor legislation surrounding water use at a new build and the equally problematic attitude of New Zealanders that 'it is my God given right to use water' (CGI5). Here, a vast majority of the population has come to expect continued, uninterrupted water supply, and as such, water and water conservation as a nation is generally undervalued (CGI5). Having the right acts and regulations in place is crucial for allowing local city governments to act, and progress is taking place, albeit it in slow incremental steps. In the meantime, local city councils are sitting as the middle-person between central government and the community trying to leverage what they can from the regulatory frameworks above them to influence consumer, individual and developer behaviours below them.

The role of banks, funders, the government and developers

The values of developers, central governments and their sources of finance powerfully shape the kinds of development we are currently getting. “Not all of our banks will lend to different family members [for co-housing]... and so this becomes a barrier to achieving co-housing” recognizes HCCO2. Shearer

et al. (2016, p. 811) note that “the primary risk faced by developers is market risk, the risk of not selling or leasing at anticipated rates and prices... [particularly in terms of] interest rates, consumer tastes and the untested appeal of a new product”. As such, banks tend to be risk-averse and typically prefer loaning to larger, more established clients (Shearer et al., 2016). Funding, which is critical to any form of development, is mostly undertaken by large financial institutions such as pension funds, insurance companies and banks. Thus, “confidence in property as a secure investment... is based on the unique nature of land and property, the fiscal advantage of income from property, and the growth of rents overtime” (Kirk, 2018, p. 39). Murphy (2000) recognises that private institutions have been reluctant to offer loans and mortgages to Papakainga’s or alternative models of housing. This concern is shared by CGI3, CGI6 and HCCO2 who call for bank institutions to be less risk averse and more mature with their investments and support alternative development models such as, Community Land Trusts, co-housing or papakainga’s as they are not new and scary propositions. At their core, these models are structured around collective living rather than the typical profit-making model that influence most bank-funded housing developments.

A paradox emerges when politicians are asked to reform development legislation as the (economic) success of the industry is what drives policy decisions in the first place and so politicians who play a key role in influencing policy are simultaneously being influenced by the industry (CGI1). As such, “it is almost to everyone’s benefit that these industries carry on because that is where the money is” and what, in fact, needs to happen is an unravelling and systemic restructuring where industry success is not solely based on GDP (CGI1, CGI6). A key point here, brought up by CGI3, is that “the capitalist framework is so artificial because we are saying land has a monetary value that anyone can own and sell and that actually, good quality, socially designed, well designed community housing is our right. It’s not something I can just choose if I can afford it”. Furthermore, since people view property ownership as an investment, ownership of a house becomes directly linked to their financial security or ability to sustain their family (an individualist notion of security) (CGI3). However, it is worth questioning this idea of ‘security’ and asking how it can be fostered in ways other than home ownership. Collective communities, for example, have the ability to provide security for each other but to create these relationships and interactions, cities and urban areas need to be better designed to encourage interaction (CGI3; CGI4). When people are living more individual and isolated lives, represented in the current housing models and developments we see today, there tends to be a disconnect between people and place, causing mental well-being to decrease, internal conflict or unhappiness (CGI4).

Another paradox is present in the role of the developer. Here, the short-term focus of developers can, however, also be worsened by the short-term lending constraints placed on funding where developers

are likely to have to repay banks within a few years (Shearer et al., 2016). This places developers in a difficult spot: catering for the longer-term market of more expensive, sustainable and energy-efficient houses (where the market is not quite there yet) or the short-term realities of production and financing commitments (Shearer et al., 2016). HCCO4, however, notes that the people who have the most influence in setting and meeting better development outcomes are the developers as they are the ones who typically appeal new requirements in the District Plan. In turn, developers hinder many sustainable development initiatives. Market awareness and lack of education are also to blame for the lack of innovation and alternative housing models as, according to HCCO4, many people do not know any better or trust their developer to have built their house properly and so are continuing to drive the market towards business-as-usual practices and not demanding better (HCCO4). This is worsened by the fact that community members hardly ever submit to District Plan proposals and so such plans end up being dominated by developer input who influence and manipulate the planning frameworks to make it easier for them to develop and make money whereas the community don't express the same amount of drive in wanting to actively change things or save money through having better designed houses (HCCO1). Generally, however, HCCO1 notes that there does not appear to be sufficient political appetite to impose higher standards than the Building Code, which, at the moment, is the absolute minimum standard. Economic pressures mean that most developers will chase a minimum standard or only pursue a higher standard if there is economic benefit to them. For councillors to enforce better than minimum standards, they need to get sufficient political support which requires getting the public motivated about change which can be difficult (HCCO1). In the meantime, the best way to incentivise and encourage developers to design and build better is through using economic instruments such as development contributions or rates (HCCO1).

Overall, there seems to be a number of barriers prohibiting regulatory change at a local and central government level. This is largely due to the influential role developers play in shaping District and Structure Plans who, in turn, can be influenced by the funding received from banking institutions. It is worth considering that gaining access to funding is critical for any developer. However, "if lenders in the post-Global Financial Crisis environment are increasingly risk-averse, and unwilling to finance new or innovative products, this will act as a disincentive to produce such products" (Shearer et al., 2016, p. 824). When asked on what role HCC can play in enforcing particularly development outcomes, HCCO2 noted that "we are limited because we are not developers so our work is really about setting the rules and encouraging developers and giving mechanisms potentially to some of our community housing providers or not-for-profits to do something differently. It is not passing the buck of responsibility so much as it is recognizing that we do not and cannot do everything".

Planning shortfalls and resilience

There is a recognition and sense of urgency that while organisations or people understand the pressure and need for systemic change, developments fail to often lead from that space or have the same drive and vision for change (CGI1; CGI3). Ultimately, as summarised by CGI1:

the government are meant to be looking after the people, the land and people's systems and economies – they have that role to play and to implement what is best for everybody whereas developers have short-term goals and will likely not have to deal with issues from their development 20 years down the line, so who then bears that long-term cost? It is the government and so they need to have the best interest for everyone and enforce above minimum standard practices.

Similarly, the effects of climate change are going to impact New Zealand locally, regionally and nationally, and so there is an opportunity to act now. Yet the inaction of politicians (in the view of CGI6) to only act on things when it is right in front of them is detrimental to the long-term resilience design of our communities. There is a “responsibility, not just on current generations, but on future generations to envision a world where we are responding to our most pressing issue of our generation” (CGI6). Importantly, when it comes to the urgency of needing to create a resilient community, it is risky, and perhaps irresponsible, to leave this up to the chance that developers will decide to do more than the bare minimum. When it comes to building resilience to climate change at a local-level and city scale, it is key that innovation starts now. In terms of community resilience, HCCO3 explains that is centres around how the community will operate and knowing what to do in emergencies or civil defence scenarios (HCCO3). This, however, in itself is a fairly limited notion of what a resilient community means.

Responding to climate change in the context of Peacocke has focused predominately around adaptation rather than emission reduction, which has meant making sure future climate scenarios around flooding, increased rainfall intensity and river levels and stability have been considered in the design (HCCO3). While there is an acknowledgement that some areas need to be improved, clarity also needs to be given around how far advance is HCC planning for. HCCO3 recognizes that there is no current framing that ensures that climate change is considered from the start, so there is an opportunity to continue to evolve and improve planning process. While climate change is addressed in the ICMP, it largely focuses on the mode shift from individual vehicles towards buses, walking and cycling through the design of the road and pedestrian networks (HCCO5). However, in terms of each building, HCC cannot become prescriptive in terms of what they should look like and will receive a lot of push back (largely from developers) if they did (HCCO5). While New Zealand is starting to wake up

to the changing water patterns, rainfall and water use, as cities grow, these challenges are likely to become exacerbated (CGI5). Water shortages also become more visible in summer when restrictions are in place, therefore affecting people directly. In contrast, energy supply and use are consistent throughout the year, so there is not the perception and awareness that there is an energy over-use. Innovations such as grey water reuse or rainwater harvesting tanks are not that 'out there', and, rather than reacting to severe water shortages, there is an opportunity to make these changes now. Because a large proportion of New Zealand's energy is from renewable sources, people do not understand that they still need to reduce their energy usage (HCC03). CGI5 recognizes that good changes are happening in this country but they are slow, and argues that the real innovation and hard work is coming from small organisations or individuals rather than national or local government.

From a community perspective, the following are the perceived barriers and shortfalls in government planning: the dominance of the market (CGI3); the struggle to include social amenities (such as gardens, museums and swimming pools) alongside housing development to meet the needs of the growing populations (CGI3); the barriers to bringing together different sectors to reduce competition over funding (both in government and outside of it)(CGI4); the lack of adherence to Treaty principles (CGI4); the failure to integrate and connect retirement communities into general community areas (CGI4); and, the gap in translating the SDGs and the Climate Act down to the local government level (CGI1).

From the HCC officials' perspectives, there are a number of shortfalls or barriers in the planning process too. The lengthy process of constructing the Structure Plan and the subsequent appeals by developers can result in the community or their aspirations being left behind because the process goes out of the HCC's control when appeals end up in Environment court (HCC05). This also puts the court in a position to make decisions that are potentially not environmentally-focused or sustainable when ruling in favour of the developers. There is also a perspective that the consumer is the one who needs to put pressure on the developer to demand and ask for higher house standards due to the struggles local government face in implementing regulations from the top down (HCC05). HCC03 noted that there is also a lack of clarity in what council's role is and, as HCC is funded by rates, they are conflicted between acting in a way that HCC (the elected councillors and policy/planning staff) thinks is right, or in a way that diverse rate payers think they should be acting. This is a similar concern expressed by CGI6 (who receive government funding), who said "how much can you try to change and influence that hand that feeds you?" One of the biggest challenges, however, is that the RMA, the Local Government Act, the Transport Act and the Building Act are not consistent with each other. Without such consistency, it becomes easy for people to argue out of things because they can pick and choose which legislation to follow (HCC01).

HCC officials make it clear that they are striving to do things at a level that is better than what has been done in the past, and express concern about putting something too radical out there that certain people or parts of the community would not be happy about (HCCO5). It is important to also acknowledge the timeline of the Peacocke project. The road corridors were considered in 1964, Peacocke became part of the city in 1980, the first structure plan was developed around 2007 and was then updated in 2012, which set the infrastructure and the Southern Links boundaries, and put into motion the principles on how they were going to be used (HCCO1). So, what is happening now, through community consultations and Structure Plan reviews, is largely what is going to take place in between the designated boundaries and strategic infrastructure, and so community input on vehicles, for example, cannot have any effect as decisions on roads have already been made (HCCO1). There has, nevertheless, been support expressed for the Peacocke development primarily in terms of its location by CGI2, CGI3, CGI6, HCCO3, HCCO4 and HCCO5. From a geographic perspective it pushes the Hamilton CBD into the centre of the city, as well as it being a sizeable development connected to the river and gullies which will hopefully inspire other developments to do the same (HCCO2). CGI2 notes that northern developed suburbs like Rototuna are difficult to get to, have expensive housing and are expensive to travel to. It was also recognised that by HCC having their infrastructure certified as a Green Star Community, it shows developers that 'this is what we're doing, what are you going to do?' (HCCO4). This is reiterated by HCCO2 who hopes that if the Green Star framework is a success in Peacocke, it will be easier to implement elsewhere and Green Star accreditation may become the norm or standard for developments going forward.

Summary

This chapter has highlighted some of the competing values present in the framings of society and development. These competing values were evident in views on planning, housing design, development, planning shortfalls and the role of the banks, funders, local governments and developers. In 'competing framings of society and development' the concepts and discourses of Prometheanism and economic rationalism emerged as a key rationale behind the government's justifications for continued economic growth and development. CGIs strongly opposed such discourses due to the fact that they typically foster social inequalities. Here, CGIs expressed a macro-level critique of such a framing of society and called for the redefining of successful development that is not solely focused on economic growth and GDP. These two discourses provided a context to the housing industry we are experiencing today while also identifying the micro and macro lenses through which the HCCOs and CGIs view and critique development respectively.

'Competing values in planning' demonstrated the need for social and environmental considerations to be included in the regulatory frameworks of a development. Without such regulations, features

such as community gardens are at risk of becoming a 'nice to have'. HCCOs here noted the challenges surrounding the implementation of community gardens, namely: challenges of ownership and the inability to enforce community gardens to be introduced.

'Competing values in housing design' explored the CGIs calls for needing alternative housing models and designs which are able to cater for the community in ways such as: affordability, multi-generational living, aging populations and accessibility. HCCOs recognised their inability to force developers to implement such housing options and instead have called on the community to demand more alternatives from the developers. Developers, meanwhile, continue to build the status-quo as they do not need to innovate or build alternative models as they are able to easily sell what they have always built. It is clear here that regulation to ensure improved housing design is required. 'The role of banks, funders, the government and developers' demonstrated the complexity of the housing development industry, particularly in terms of how such developments are shaped, influenced and at times manipulated by the various actors at play. This section highlighted the need for funding institutions to be more lenient and risk tolerant to lending to the development of alternative housing models.

The last sub-section, 'planning shortfalls and resilience' touched on the current shortfalls perceived by the CGIs and HCCOs when it comes to planning and the development industry. For CGIs, these largely focused on the need to reframe our society thinking away from having an economic focus, an adherence to Treaty principles and relaxed zoning amongst others. HCCO shortfalls centred around lengthy planning and framework processes and inconsistencies among overarching Acts and legislation. Discussions around climate change and resilience highlighted the responsibilities developers and governments play in building resilience within a community.

With such competing value sets at play, the research now turns to the imaginaries of sustainability that were evident in the interviews with community organisations and planning officials.

Chapter 5: Imaginaries of a Sustainable Community

This chapter focuses on the way the interviews revealed different imaginaries of a sustainable urban community. Here, research question one is explored. It draws on the concept of a 'social imaginary', with the goal of identifying competing 'urban imaginaries' in the Peacocke development. Potter (2020, p. 1536) explains that "urban planning in the modern global city commonly deploys imaginaries". This allows for experimental and imaginary approaches to constructing a sustainable urban community, including approaches to address climate change, resource security and community resilience (Hoffmann, 2011). Imaginaries, as described by Paterson (2016, p. 16)

can be thought of as the cognitive underpinning of experimental governance, in that [they] provides an account of a larger historical scene within which experimental efforts to address climate change [and sustainable community development] may be understood.

Typically, imaginaries exist within specific cultural, economic and political contexts (Mills, 1959). Using imaginaries within the realm of climate politics, for example, is important as it allows us to focus on the specific problems we face (Paterson, 2016). For example, when considering how to move away from reliance on motor vehicles in an attempt to reduce carbon emissions, imaginaries allow the following questions to be asked: what would daily life look like if it were not centred about driving to the supermarket, transporting children to school, commuting, complaining about fuel prices, parking spots or traffic? What would an economy look like if it did not have a motor vehicle sector and what would the negative and positive consequences of this be? Importantly, "imaginaries ... enable people to situate their current lives in their historical contexts in order to facilitate them imagining how those lives may be transformed" (Paterson, 2016, p. 18).

One of the things that emerges from the interviews is that the idea of a sustainable community resonates with people in a variety of different ways. Identifying the competing imaginaries that emerged from the interviews will be a useful way to juxtapose their contrasting visions and perspectives. Key imaginaries by the CGIs are generally depicted as being 'transformative' while HCCOs imaginaries are typically 'reform' based, involving a slow shift from the status quo.

The first section of this chapter therefore imagines a sustainable community where imaginaries that emerged from the interviews were used to construct an imaginary sustainable community with a particular focus on housing design and community design. Later in this chapter, I will also discuss the limitations and challenges to implementing and achieving sustainable communities.

Imagining a sustainable community

The concept of a 'community' in itself is difficult to define but is generally understood as an "ethos in which people come together united in a common purpose" (Holland, 2004, p. 288). It can typically be characterised as a collection of people with opposing perceptions, religions, skills, views etc. who achieve collectively agreed outcomes by working in a cooperative way (Khan, 1999). Hempel (1999) defines a sustainable community as one that links social well-being, civic democracy, ecological integrity and economic vitality in a way that fosters a sense of reciprocal obligation and high quality of life among its members. According to Holland (2004), the features of a well-functioning community include the following:

- It is well established, where people feel safe, they want to belong to it and feel part of the community
- There is environmental responsibility and awareness
- Members are aware of the differing needs of the people within the community and attempt to meet those needs
- There is economic opportunity
- There is a common value set shared amongst all the members
- Participation and consultation are apparent in decision-making processes
- Diverse local structures are involved in the process
- There is quality of opportunity, and
- It allows for self-development through community activities, skills development and training.

So, to take these ideas further, what would a sustainable community look like? How do CGIs and HCCOs envision a community that is self-sustaining? What would a community look like that is not dependant on water and energy services and infrastructure? What would it mean for the community if zoning laws allowed people and commercial interests to mix and integrate?

Transformative sustainable community imaginaries, largely expressed by the CGIs, demonstrate a radical revisioning of a society. Here, human-nature relationships, food resilience and community relationships become the centre-point for community design. CGI3 imagines a community where everyone has a real connection with the land, the seasons (either for growing food or for foraging) and the bush. Such a community would have a collective security and resilience amongst the people where members would no longer live isolated lives, but rather can rely on each other in times of need (CGI3). Sustainable communities need to function in a way that encourages resilience, whether this is through responding to the changing climate (by having rainwater harvesting tanks in times of drought, for example), creating food security (by ensuring access to and skill development for planting and

growing vegetables), or the post-Covid-19 climate of people needing to feel confident in being able to make it through a lockdown (CGI5; CGI6). Other imagined ways of being would be a community that has less fencing, less individual ownership and more papakainga (co-housing) (CGI3). These ideas can transcend into how water, wastewater and sewage services are designed and utilized and can, instead, feature combined water collection points; localised water solutions; rainwater capturing and storing; compost hubs; and, worm bio-digesters (CGI3; CGI6). Other social aspects could include: ensuring that the right mix of people who will take ownership and care of the community are involved (CGI6); improved health and well-being (HCCO4); improved recognition of our cultural history (HCCO4); carbon neutrality (CGI1; CGI6); dominance of public transport, cycling or walking (CGI3); location of daily needs (schooling, supermarkets, doctors, employment etc.) within walking distance (CGI3); location of food systems closer to urban areas (CGI1); a sense of connectivity, pride and high levels of happiness among the people who live there (HCCO4); the prioritising of the well-being of its most vulnerable with the infrastructure to support that (CGI6); and, ensuring that food resilience is built into the design and running of the community (CGI1; CGI6).

For such collective and sustainable communities to work, however, people need to feel like they belong to it, that they have an equal voice and will benefit from this different model of living (CGI4). Otherwise, members may have little vested interest in putting in the hard work and energy that it requires to sustain such living over the long-term (CGI4). There is thus a reciprocal relationship in sustainable community living, where people within the community need to understand their role in the system, how they are going to benefit and how they are going to add value so that each individual acts not only as a receiver of all the benefits, but also a giver of time, skill, energy or resources (CGI1).

Even though some HCCOs are sympathetic to the idea of sustainable communities, their approaches and interpretations are very much within the existing legislative and institutional structures, thus reflecting a 'reform' imaginary. Here, ideas are confined to regulatory thresholds, consumption and pollution levels, economic aspects and, waste disposal. Such ideas included: reduced air emissions (HCCO4); reduced stormwater discharge in the Waikato River (HCCO4); accessibility to nature (HCCO4); increased biodiversity (HCCO4); low levels of pollution (HCCO3); the ability to sustain the use of the land and not overuse resources (HCCO2); and, where recycling and waste management systems are present, to reduce the amount of waste entering the landfill (HCCO2). Economic aspects could include: the ability to delivery truly affordable housing (HCCO4); encouraging local economic development or mini enterprises so that money stays within the community (CGI6; HCCO2; HCCO4); and, not bringing in chain stores or multi-national franchises (CGI6). None of these are 'new' or 'transformative' ideas and, instead, demonstrate an adherence to current planning thoughts and legislative requirements.

While an in-depth study into working out the realities and limitations of such imaginations may be needed in and of itself, these questions, thoughts and ideas have certainly imagined a scenario of what *could* be. Imaginations such as these which rely on the behaviour change of individuals also runs the risk of people become objectified “rather than active agents continually remaking their lives in complex social settings” (Paterson, 2016, p. 21; Shove, 2010). Lastly, while imaginations can be deemed *too* transformative when calling for new ideologies and worldviews, they are not impossible and are still useful considerations to have when planning for urban development (Paterson, 2016). The following two sections delve deeper into the possibilities of imagining better housing and community design.

Housing design

There are numerous ways in which to imagine housing to be more sustainable or accessible to the everyday person. Transformative imaginaries regarding housing design emerged from the CGI interviews where ideas focussed on land ownership, accessibility and functionality. Here, house design could include the terracing, high rise or high-density of housing areas with surrounding greenspace, plazas and allotment gardens (CGI3). So, while each person may have to give up their individual ownership of land, they still have access to greenspace and commercial and social areas where people could come down from their house and gather in those spaces (CGI3). There should also be a relaxing of zoning laws which would allow for opportunities for shops or spaces to organically evolve over time (CGI4). Here, people should be allowed to live upstairs and run a shop downstairs, for example, making life easier for that family (CGI4). In this instance, people no longer need to commute far distances to work and they are able to care for the young, elderly or sick at home while working. This also allows children to grow up around the shop and within the community, who then become familiar to everyone else living in the community who, in turn, are able to look-out for that child (CGI4). This way of living fosters a sense of belonging, togetherness, security, community and resilience where people are able to turn up for each other in times of need. Children who grow up in this environment, who feel like they belong, will also be less likely to leave when they are older, or if they do, are likely to return, and so there will be less fracturing of families and growth will remain within the bubble of that area (CGI4). This is particularly relevant to the Māori whose sense of place is so instrumental to who they are as an identity, so “being able to affirm individual identity that is wrapped up in a place creates a vested interest in being there and making sure it is cared for” (CGI4).

As mentioned, there is a desire and expression of need for more variety of housing scenarios such as the papakainga (CGI3). Houses should be designed to accommodate and be more inclusive right from the start and be able to grow and shrink with the changing family structure over the years (CGI6). Each house has the potential to be designed with level access, wider doorways and wider hallways so that

they meet the changing needs of a person's life over the years, rather than having to spend money retrofitting it at a later stage (CGI2). Life-term tenancies or very long-term tenancies could be considered since those who can only afford to rent struggle to connect with their changing communities when relocating (CGI3). This is opposed to those who are able to own a home, and thus have the privilege and security of being able to stay in one place (CGI3). Importantly, there is a need to encourage intergenerational living which leads to intergenerational transmission of knowledge (CGI3, CGI4). This also allows people to have easier access to their older and younger generations as opposed to the stress and challenge of visiting family located in different suburbs around town (CGI3).

Furthermore, it is not inconceivable to imagine that every individual plot could have the opportunity to grow food or have collective food areas and CGI5 goes on to suggest that there is no reason why the Peacocke development could not be producing 30-40% of its own food. Considering the recent Covid-19 lockdowns, it is no longer unimaginable that people would not want to live in an environment or a community where they do not have to commute to the supermarket for the bulk of their food when they could go outside and harvest it or collect from and share with their neighbours. New Zealand's wet, moderate climate is particularly advantageous to growing food, and while you would never be able to grow it all, there is an awful lot that a community could grow and share collectively (CGI5). Roofs and gutters can also be designed to be able to collect pristine, crystal clear water (most of which comes off the Tasman sea where there has been no smoke, nuclear power stations or pesticides). So, while rainwater is typically pumped through stormwater drains into the Waikato River, an opportunity is lost where individuals could collect and reuse that water in their homes as grey water. Where appropriate, there could also be legislation that rain water tank and water filters are mandatory, and where it is also possible (and for this there may be less opportunity), there exists opportunity to deal with your own wastewater on site (CGI5). At Peacocke, as suggested by CGI5, it could be possible to have 90-95% of the houses built with water collection, and for maybe 50-60% of the houses to have on-site waste disposal. This means that at an infrastructure level, less supply lines and waste lines would be needed. Unfortunately, with the way this development has been structured, this is unlikely to occur since the infrastructure has been put into place prior to the community and sub-division plans being finalised.

The thermal performance of any house is the most important thing, according to CGI5, as it allows for homes to be warm in winter and cool passively in summer. This largely comes down to good, innovative building design which considers aspects such as building orientation, the size and shape of it, the complexity of the exterior, thermal mass, air tightness, insulation, energy efficiency and shading inventing (CGI5). To help achieve this, there should be a performance framework assigned to each build so that buyers or renters know what the energy and water efficiency of the house that they are

buying in to is (CGI5). In terms of solar energy, however, since 85% of New Zealand's energy production is already sustainable there is less motivation to invest money and resources into installing more renewable energy technologies (CGI5).

Community design

Imaginations of community design, again largely 'transformative' from the CGIs focus on thoughts such as accessibility, skill sharing and development, community identity and resource ownership. HCCO imaginations, in contrast, were limited to the boundaries of the Peacocke Structure Plan and focused on security, public transport and infrastructure development.

One of the key components of CGIs' community design is accessibility. People need to have easy access within and out of their community as many people may be unable or unwilling to travel to support their family network (CGI2). This is particularly important for community members who are mentally or physically challenged and who are more inclined (at times out of necessity) to stay in certain areas because their family or their doctors might be there (CGI2). This again touches on the need for a shared community of interest and security. Public transport is also key and needs to be fully integrated into the design of the community, however this may look. It should be easy and accessible for people with disabilities to take public transport but it also should not be complicated to get between communities, suburbs, areas and cities (CGI2; CGI4; CGI6). Public transport could also be in the form of smaller shuttle services (as opposed to larger buses) particularly in areas with smaller populations (CGI4). Seating on the shuttle could be booked online, cheap to use and run by either a city employee or a volunteering member of the community. In terms of vehicle space and usage in a community, an idea could be to put the parking footprint in one area so that there are no vehicles in the inner part of the suburb since not each person needs their own parking spot (CGI3; CGI4). This not only increases interaction but people will become less likely to use their vehicle as much as it will no longer be as convenient to get in it and go (CGI4). It may also encourage the use of bicycles and by placing bike railings at every home, multiple spaces for visitors to park their bike become available (as opposed to the overcrowded of streets with vehicles) (CGI4). Similarly, not everybody needs to own a big van or multiple vehicles, but, rather, larger vehicles could be community owned (either donated by the HCC or fund-raised by the community themselves) which can be borrowed by people when needed or used as part of the shuttle service mentioned above.

Collective community living also recognises that everybody has skills, resources and property which should be shared (CGI3, CGI4). Not everybody needs their own lawnmower, electric drill, kayak, trampoline etc. but rather a tool shed for garden care and recreational items could be used by the community to share their appliances and equipment (CGI4). The tool shed could also be used as a

place to use the equipment, to make a shelf or do some building or repair work. It could be run by a system where before you are given the keys to the tools, you have to show selected community members that you know how to work with them safely (CGI4). Alternatively, rules may be established where certain equipment is not allowed to be used without having someone else present. A community hall with a kitchen could be used to host events, throw birthday parties or the kitchen used if someone needed to cook a big meal (CGI4). Community halls can also be used as the centre place for dentists or optometrists, for example, to come to the community once or twice a year to meet everybody, have a meal and provide their services to anyone who may need them or who may not be able to travel into town to see them (CGI4). If the community decides that a craft room is missing, then a craft room could be created at the community hall with sewing machines etc. to be loaned. When a newcomer moves into the neighbourhood, they are shown the procedures on how everything works as well as being introduced to the neighbours. Importantly, it is the community who decides on what system to use and how they are going to implement it to keep them, and the assets, safe (CGI4).

Collectively, this means that each person does not need their own big house to accommodate all of these things which get used only every so often. But instead, people can live in smaller, more energy efficient spaces and use the bigger community spaces as needed (CGI4). This also forces integration and establishes bumping spaces and communication between people, which again, fosters belonging and a sense of community and collective security. Parks could be designed better in terms of having better bumping spaces by providing community garden space that is accessible to everyone, composting facilities, fruit trees and things to do for all ages (CGI3, CGI4). It is key to have a variety of different spaces, including private spaces, and activities as some people thrive in some areas and skillsets and not others (CGI3). Other items could be chicken pens or bee hives for the community to then decide how they are going to share up the resources (fresh eggs and honey) or create little economic projects such as selling the eggs and honey to generate income which can be used by the community when needed (CGI4). Fruit trees, vegetable gardens, chickens or bees are unlikely to be abused or exploited by the community members if they have a sense of respect and ownership of them (CGI4). For community gardens to be successful, a school, individual or cluster or people should take primary ownership of the garden and work with the community to decide how best to share the resources and put the community at the centre of such decisions (HCCO3).

Having a collective and sustainable community aids in establishing the identity of the neighbourhood, suburb or development, and linking it to key environment or natural aspects is the easiest and best way to do this (CGI6). Suburbs which are home to the pekapeka bats, for example, could start fostering their community identity by running bat education evenings, bat house-making workshops and bat

monitoring programmes so that the identity of the community is linked to its place. This has a number of benefits: people become educated about the bats and in turn will be more willing to protect them; the bats' well-being and habitat is improved; the community establishes and secures its identity; and, they will have a vested interest in caring for the environment and the community as a whole (CGI6). This has follow-on effects where community engagement will then extend beyond the bats towards other community development projects. Neighbours in historically rich kumara or fruit tree areas could do the same process within their area of historical or cultural significance and so collectively, the Peacocke development could have a mix of identity specific suburbs.

Community imaginaries expressed by the HCCOs, however, are confined to their expectations and assumptions of what the Hamilton community would like as well as the development of good alternative transport route options and infrastructure. HCCO2 and HCCO4 have expected that feedback from the Hamilton community about what they want to see in Peacocke is making places easy to get around; people wanting financial control of their space; affordable housing; greenways (undeveloped land set aside for environmental protection or recreational use); blue ways (water trails in lakes or rivers used for recreational use); a feeling of connectivity in the neighbourhood; and, a feeling of safety. According to HCCO4, connectivity is promoted in the District Plan with rules to support the connectivity between particular areas. For example, buffer zones such as shared paths alongside gully systems that are safe and wide to cycle through which support connections between areas (HCCO4). HCCO2 notes that connectivity is promoted through the way the roads are structured where walking and cycling create 'eyeballing' connections so that individuals become familiar with their neighbours. Furthermore, utilizing nature, biodiversity and greenways can create connection which we should not underestimate. HCCO4 notes, however, that council's role is really to put in the infrastructure, the parks, community infrastructure and to write the rules but that in terms of actually developing a growth area, it is the people who own the land and the developers that drive that. It was also evident that the community members themselves need to decide on what they want out of their community, how that change is going to happen and who may lead it (HCCO4). As such, any design of a sustainable community needs to be a co-design from the very beginning which may require skilled facilitators and the buy-in to the cost and the process of what that entails (CGI1). Fundamentally, clarity needs to be provided on the realistic roles and responsibilities that the HCC and community members have in making this a success.

There is therefore an unclear understanding of how and who drives the development of a community as described above. It is evident that a sustainable community needs to extend beyond the realms of the physical structure of buildings, parking lots, community gardens and sheds. Instead, questions could be asked such as: what would a sustainable community look like if local governments were not

restricted by current regulatory frameworks? What would a sustainable community look like if developers played no role in the location of services, buildings and infrastructure and, instead, communities were included in meaningful ways in wielding decision-making power as to what was to be developed, where and how?

Challenges to sustainable community design

There are, nevertheless, particular challenges that arise with establishing effective sustainable communities. Firstly, it is important to recognise that definitions and meanings of what it is to be sustainable change over time and so what may be deemed a 'sustainable community' today, may not be deemed sustainable in a number of years down the line (Hempel, 1999). As such, communities need to be able to adapt to these changes and be open to continuous learning and re-development (CGI4). Even more challenging is defining what constitutes a sustainable community in the first place. Whether developers, local governments or community members are attempting to define and design a sustainable community, conflicting ideas of what they may entail is likely to always occur.

Aspects elaborated on in the interviews included the need for people to know how to form relationships and how to figure out conflict (CGI3). While often challenging, this can be overcome by drawing on the wisdom of people who have lived that way and so a key component to establishing such a community is identifying the voices of the people who need to be listened to (CGI3). Furthermore, the people within the community need to actively want to live in such a way (CGI3). The processes need to therefore be clear around decision making and the responsibilities of each individual, which is not always easy but, optimistically, CGI3 notes that "we have probably lived enough in this time of very individualistic living to know that actually it is not really working". It is key to also recognise that when planning for ways in which to include different demographics of people in a community, people's experiences and limitations cannot be generalised whether it be around certain disabilities, cultures or ethnicities (CGI4, CGI6). The same demographic or group of people will experience things differently in different places. So, to ensure that people experience a sense of inclusion and belonging, it is critical that such intersectional inequalities are addressed by accurately representing all demographics in the planning process, community discussions, and leadership positions, and asked about how places can be better designed for their needs (CGI4, CGI6). In terms of community gardens, craft rooms or tool sheds, HCCO3 acknowledged that the community are the right people to be asking 'we have this space, what should we put here?' So, such discussions and decisions for Peacocke's design should not yet be happening as the community is not yet there. Of course, this runs the risk of having a community that may not want to utilize such resources but that needs to be deemed the choice of the community at that point in time (HCCO3). HCC should, however,

play a role in the initial set-up of the community and igniting the discussions between the members (HCCO3).

It is worth remembering the context of the Peacocke development within Hamilton. As Hempel (1999, p. 60) notes, “given that today’s community needs and opportunities can be heavily influenced by international trade arrangements and foreign investment, it is difficult to devise allocation rule that work to the benefit of both individual communities and regions (or global systems) as a whole”. Here, while a sustainable community has been imagined not specifically in the context of Hamilton, the reality of having a sustainable community within the Peacocke development will demonstrate this exact point. The development has ultimately been positioned as a response to a housing shortage within Hamilton. As such, trade and employment opportunities are an intrinsic component of the relationship between Peacocke and the Hamilton city (if not even further out into the region). The Peacocke development is ultimately subsidizing for city growth by providing the housing necessary for the people to make this growth happen.

While imagining a sustainable community is possible, the realities and limitations to achieving this vision can be difficult, particularly in the absence of any concrete examples (Hempel, 1999). Despite the challenges flagged by Hempel, there are numerous successful examples of such ‘alternative’ forms of community both here (such as Earthsong in Auckland and Riverside in Lower Moutere Valley) and around the world. As Hempel (1999, p. 45) notes, however, “even if persuasive examples could be found and unifying visions embraced, few contemporary institutions or systems of governance appear flexible enough to carry out such visions in a timely manner”. Ultimately, short-term adaptability and long-term foresight play a crucial, and difficult to manage, role in establishing communities where economic vitality, social justice and environmental quality are at its core (Hempel, 1999).

Summary

This chapter has presented an analysis of the imaginaries of sustainable communities, based on the interviews conducted for this research. Here, thoughts and ideas have imagined a scenario of what *could* be. Two sustainable urban imaginaries were identified: transformative and reform. Transformative imaginaries, largely expressed by the CGIs, demonstrate a radical revisioning of a society. Here, human-nature relationships, food resilience and community relationships become the centre-point for community design. In contrast, HCCOs’ approaches and interpretations fell more within the existing legislative and institutional structures, thus reflecting a ‘reform’ imaginary. Here, ideas were confined to regulatory thresholds, consumption and pollution levels, economic aspects and, waste disposal.

Such imaginaries progressed from innovative and energy-efficient building design to how community members could operate in their day-to-day lives. Housing design largely focused, again, on the introduction of alternative housing structures, smart energy and water efficient design as well as the ability to run commercial businesses from home. Community design focused on communal aspects such as the introduction and utilization of community tool sheds; halls; gardens; and, the sharing of resources, for example, vehicles, food and even chickens (eggs) and bees (honey). Accessibility and inclusion of all demographics of a community were made apparent alongside the need for fostering a sense of safety and belonging among community members.

Challenges to creating a sustainable community were also discussed and centred largely around competing definitions of what a sustainable community entails, the responsibilities of local governments and community members in achieving this vision as well as limitations to implementing such a vision in the context of the Peacocke development in Hamilton.

The next section turns to the Green Star Communities and FEW nexus frameworks and assesses their ability in being able to achieve sustainable community design in Hamilton, New Zealand.

Chapter 6: Using the FEW nexus and Green Star framework to build a sustainable community

Urban infrastructure projects, such as the new Peacocke development, have the potential to become the interface between society and nature by managing the resource flows which influence both social justice and economic development considerations (Monstadt, 2009). Sustainable development tools and frameworks, such as the FEW nexus and Green Star, are increasingly used to guide planning decisions in the design and monitoring of new housing and sustainable developments. It has thus been worth considering how these frameworks may help to shape urban sustainable development and sustainable communities as described in Chapters four and five above.

Using a case study approach alongside the use of qualitative data collection and interviews, diverse perspectives on creating sustainable urban communities among HCCOs and CGIs were revealed. These perspectives are drawn on here to help to ascertain the usefulness and appropriateness of these frameworks in sustainable community design. They also allow for a reflection on the wider systemic views that participants have about development and what assumptions or discourses are present that underpin development. Using the Peacocke development as a case study allowed for a real-life, current and local context. Since case study approaches are defined by a bounded system and are a unique specific case, it allows for, in this instance, an in-depth assessment of the frameworks to be made that are specific to the context of the Peacocke case study (Stake, 2008). So, while an evaluation of the frameworks is made here, the same sentiments, findings and recommendations may not be applicable to a case study of a different nature.

Chapter four highlighted some of the competing values present in the framings of society and development. These competing values were evident in views on planning, housing design, development, planning shortfalls and the role of the banks, funders, local governments and developers. Here, the concepts and discourses of Prometheanism and economic rationalism emerged as a key rationale behind the government's justifications for continued economic growth and development. CGIs strongly opposed such discourses due to the fact that they typically foster social inequalities and expressed a macro-level critique of such a framing of society and called for the redefining of successful development that is not solely focused on economic growth and GDP. These two discourses provided a context to the housing industry we are experiencing today while also identifying the micro and macro lenses through which the HCCOs and CGIs view and critique development respectively. The perspectives identified in Chapter four also demonstrated the need for social and environmental considerations to be included in the regulatory frameworks of a development as well as exploring the calls for needing alternative housing models and designs which

are able to cater for the community in ways such as: affordability, multi-generational living, aging populations and accessibility. It also touched on the current shortfalls perceived by the CGIs and HCCOs when it comes to planning and the development industry. For CGIs, these largely focused on the need to reframe our society thinking away from having an economic focus, an adherence to Treaty principles and relaxed zoning amongst others. HCCO shortfalls centred around lengthy planning and framework processes and inconsistencies among overarching Acts and legislation.

Chapter five presented an analysis of the imaginaries of sustainable communities, based on the interviews conducted for this research. Here, thoughts and ideas have imagined a scenario of what *could* be. Sustainable urban imaginaries were split into two competing ideas: transformative and reform. Transformative imaginaries, largely expressed by the CGIs, demonstrate a radical revisioning of a society. Here, human-nature relationships, food resilience and community relationships become the centre-point for community design. Whereas, HCCOs' approaches and interpretations fell more within the existing legislative and institutional structures, thus reflecting a 'reform' imaginary. Here, ideas were confined to regulatory thresholds, consumption and pollution levels, economic aspects and, waste disposal. Such imaginaries progressed from innovative and energy-efficient building design to how community members could operate in their day-to-day lives. Challenges to creating a sustainable community were also discussed and centred largely around competing definitions of what a sustainable community entails, the responsibilities of local governments and community members in achieving this vision as well as limitations to implementing such a vision in the context of the Peacocke development in Hamilton.

These insights and perspectives are useful when assessing the effectiveness of the FEW nexus and Green Star frameworks as it allows for two primary assessments to be made:

- i. Is the framework operating through a micro or macro lens?
- ii. Is the framework exacerbating or demonstrating any of the critiques being presented (i.e., a focus on Prometheanism and economic rationalism and the fostering of social inequalities and the planning shortfalls identified)?

A framework operating at a micro-scale lens may fail to include bigger picture social, livelihood, economic and environmental aspects and thus risk continuing the status-quo. On the other hand, frameworks operating at the macro-scale risk ignoring the social inequalities, on-the-ground realities or community perspectives, thoughts and ideas into their planning. Both, therefore, present their challenges. Nevertheless, in the context of this case study and research, having now identified what the HCCOs and CGIs deem to be the elements of a sustainable community and what their critiques are of current planning systems – these two frameworks should be achieving their visions and not

reproducing these same critiques. In very simplistic terms, imagined sustainable communities are not being achieved through current planning and development practices, and so, if frameworks were to be referred to as a 'sustainable community framework' they would need to achieve different outcomes.

This chapter examines perspectives on the two frameworks expressed by the CGIs and HCCOs, assesses their usefulness, and addresses the second research question of this study: are the FEW nexus and the Green Star frameworks relevant and useful planning tools for sustainable community development in New Zealand? Here, assessments are made with regards to the relevance and applicability of the two frameworks in the context of promoting sustainable community development in urban New Zealand. HCCOs in particular were able to comment on their direct experience using the Green Star framework and so were able to provide a unique perspective on its usefulness and capabilities.

Green Star Communities

Since the HCC has been using the Green Star Communities framework to guide their thinking and planning around the infrastructure component to Peacocke, specific feedback around the usefulness of the framework was able to be given. The Green Star framework was introduced when the HCC were looking for a framework that was able to balance the infrastructure decisions in a way that supported the council's four well-being principles (HCCO1). Within Peacocke there are the existing rules which should be sufficient to achieve a 5-star Green Star Communities accreditation because the current planning rules are effectively adequate or a whole lot better than Australia (HCCO1). Green Star allowed an opportunity for the HCC to assess and govern themselves against the Green Star standard which has genuinely "positively changed things" (HCCO1). Overall, the Green Star accreditation has been an aspirational part of the development where "the process itself forces questions to be asked that will have different outcomes than if we never had that box to ask questions, it forces conversations which is great" (HCCO2). HCCO3 reiterated this opinion by saying that it has helped HCC to have a goal and an interest while also enabling more people to engage with the need to think differently and plan for climate change, community resilience and thinking that has typically not been the norm (HCCO3). HCCO1 goes on to say that "we did not have such a standard before and so if we raise standards, then that is more likely to become business-as-usual in the future". So, if, for whatever reason, water quality measures cannot be addressed now, the framework asks and forces you to think about what the strategy would be for addressing it in the future (HCCO1).

While the Green Start Communities framework and its five principles are outcome focused, they are un-achievable if an integrated approach to its application is missing (GBCA, n.d.-a). Sustainable

communities develop by merging various behaviours and approaches throughout their actions, they require collaboration to recognise the complexity of development processes and need all stakeholders and actors involved to work collaboratively towards a shared outcome (GBCA, n.d.-a). This is easier said than done. We can see above that the HCCOs and the CGIs express different views on what makes a sustainable community, how such a community should operate and the roles and expectations that each play in making that happen. The framework does, however, aid in defining each community's boundaries; adopting a systems approach; applying the principles in an accountable and transparent way; adapting the principles for the context and acknowledging and applying existing guidelines, codes, plans and tools (GBCA, n.d.-a).

This framework is not an attempt at replacing existing mechanisms, frameworks and tools used to guide the development of sustainable communities but instead provides the broader context for them to be considered in design, application and development (GBCA, n.d.-a). This therefore uses macro- and micro-lenses and contexts. It is also recognised "that planning plays a major role in defining the character and development of communities from a structural perspective and this framework serves to enhance that process and provide a mechanism to utilise best practice approaches to deliver sustainable outcomes" (GBCA, n.d.-a). Considering the success the framework has had in shifting HCCOs' mindset around planning and engagement, I certainly think it is a beneficial framework to utilize going forward. Reservations come when ascertaining whether it is the *best* framework the HCC could be utilizing. Reed et al. (2011), for example, found that the Green Star system has lower building regulation standards than the UK BREEAM (Building Research Establishment Environmental Assessment Method) system so a 6-star Green Star and an 'Excellent' BREEAM office building are not equivalent with regards to their environmental impact or sustainability features.

Overall, the Green Star Communities framework has limitations in this context. While the Peacocke project is likely to receive a 5-Star accreditation, this is only for the HCC-driven infrastructure of the development. This is potentially less people-centred and more process- and outcome-centred than other aspects of the development. Developers, on the other hand, are not obligated to build Green Star Communities or Green Star Buildings, and so, while the infrastructure for Peacocke may be Green Star approved, the individual house builds may not be. Furthermore, it would be worth assessing the difference in building standards between Australia and New Zealand to see whether this framework improves our current standard or not. HCCO1 notes that "within Peacocke, there are the existing rules which should be sufficient for us to get to five stars because the current planning rules are effectively adequate or a whole lot better than Australia". This implies that the Green Star framework standard is not far off the current New Zealand standard and so doubt is raised as to exactly *how* much better the development now is. While the Communities framework has been modified to include several

credits which address New Zealand requirements specifically, all Green Star projects have to be certified by the GBCA.

In ascertaining whether the Green Star Communities framework is a useful tool to promote the development of sustainable communities, in the context of what has been seen at Peacocke, it may be too optimistic to say so. There is, however, potential that the mind shift changes in HCCOs on liveability, governance, economic prosperity, innovation and environment aid in achieving the key foundational aspects of what makes a sustainable community and should help in overcoming many of the critiques identified by the participants. The context of Peacocke means that each developer, sub-section or neighbourhood has the potential to be a business-as-usual non-Green Star development and so having an overlaying Green Star Communities accreditation may not necessarily result in achieving the on-the-ground realities of what makes a sustainable community. If each developer, however, were to guide their work utilising the Green Star Communities framework alongside the Green Star Buildings and Interior framework then better standards will be achieved.

The FEW nexus

The FEW nexus, while having the potential to include wellbeing aspects depending on the variation of the nexus used, is typically not a framework centred around wellbeing at its core. It is a framework primarily focused on food, energy and water resources. It could be a useful framework in 'back-casting' development by identifying the trade-offs and synergies present, re-modelling it to reach the desired outcomes (more synergies and fewer trade-offs) and thus identifying where to focus development modifications. As such, HCCO1 suggested that perhaps it is better suited to drive national or regional policy and so by the time such policy reaches the District Council level, decisions as to how to join together the social elements, liveability or environmental livelihood security aspects within it are then made (HCCO1). This, however, could defeat the point of using the ELS FEW nexus as described by Biggs et al. (2015). We have seen that challenges to implementing sustainable initiatives (from both the CGIs and the HCCOs) have overwhelmingly reflected a lack of overarching national policies which enforce better housing standards. Continuing to therefore focus national policies on resources only removes social well-being and livelihood security from being present and supported in national-level legislation. Well-being frameworks, as recognised by HCCO1, are much easier to translate at a local level than business case and economic based models.

There is, however, evidently a need for greater efficiency in energy and water usage and management in cities as well as a desire from communities for improved food security. Whether the FEW livelihoods nexus can address these issues within a small context such as this is unlikely. However, this particular nexus does provide a holistic and equitable way in which to look at a development but it may be better

suiting in the context of one stand-alone project or house. Yet, when looking at the criteria established in previous chapters as to what constitutes a sustainable development, the FEW nexus could certainly play a role in demonstrating the trade-offs and synergies between energy efficiency, water efficiency, cultural activities, sanitation, income diversification, access to water, access to food, water quality, landscape management, waste water treatment, knowledge transfer, transportation, emissions, carbon emissions and local economic development amongst others.

As mentioned, to utilize the FEW nexus in the context of the Peacocke development would require a nexus assessment of the development as a whole and then a nexus assessment of each sub-division or developer. A nexus assessment of the Peacocke project as a whole, however, could indicate which negative trade-offs are unable to be transformed into a synergy due to regulations or legislation. This has the opportunity to focus policy makers on reforming restrictive legislation so that it instead becomes an enabler or positive synergy. This has the potential to address some of the critiques expressed by the CGIs and HCCOs who note that restrictive legislation is a barrier to achieving some sustainability goals. Similarly, doing a nexus assessment of a developer sub-section will indicate which synergies could be utilized further or what role local council could play in synergy creation at a developer scale.

The FEW nexus has, however, received a number of critiques which are similar to many of the concerns expressed by the participants. Though the nexus primarily focuses on ensuring the provision of food, energy and water resources to meet human needs, there is risk that such a focus risks undermining environmental value while promoting anthropocentric goals (Artioli et al., 2017; Flint et al., 2013). As such, the nexus can be perceived as “a response offered within a capitalist system to ensure the ongoing availability of natural resources” and to therefore not challenge it could be to utilize it as a tool to foster neoliberal policies and current inequalities and power structures (Allouche et al., 2015; Artioli et al., 2017, p. 217). Systems approaches, such as FEW nexus thinking, have also been critiqued as being under-politicised or inadequately theorised, particularly from relational and historical perspectives (Middleton & Allen, 2014). As more and more actors in the private sector pay attention to and incorporate nexus thinking and resource management, there is a concern and risk that the nexus will be used merely to legitimize and/or re-label business-as-usual agendas rather than actively address issues of sustainability (Leck et al., 2015). As such, if using the FEW nexus, it is critical to use a variation of the framework, such as the ELS FEW nexus, that incorporates aspects other than just the food, energy and water resources. In the context of the Peacocke development, and in light of its many critiques or challenges to overcome, I am doubtful that it is the best framework with which to achieve a sustainable community development in Hamilton.

Summary

This chapter reintroduced the FEW nexus and Green Star framework and assessed their usefulness in being able to guide sustainable community development in the context of the Peacocke development. Both frameworks demonstrated their limitations and concerns and were hindered by the unique context of the Peacocke development. The FEW nexus, however, has the potential to influence legislation and policy decision-making at a local and national scale while the Green Star framework has clearly demonstrated its ability to shift the mindset of HCCOs towards more holistic planning and thinking.

It is fair, therefore, to say that neither framework is the perfect exemplar of a sustainable community development framework. However, in light of the diverse perspectives identified by the research participants in terms of sustainable community design, it is unlikely that any framework will be able to achieve such a vision without its limitation and challenges.

The final chapter provides a summary of the research and its main findings, reflects on the implications of these, and identifies limitations and makes recommendations for further research into sustainable community design and the usefulness of planning frameworks.

Chapter 7: Conclusions and Recommendations

Numerous planning frameworks have emerged over the past decades to inform decisions about the design and development of sustainable communities, raising questions about which framework to use within which context. Different frameworks are informed by various definitions and perceptions of what makes a sustainable development and what a 'sustainable community' or development looks like. This thesis examined two of these frameworks, the FEW nexus and the Green Star framework, and how these frameworks have potential to shape urban sustainable development and sustainable communities within the context of the Peacocke development.

This research attempted to answer two questions:

- 1) What are the implications of diverse perspectives on creating sustainable urban communities in the context of the Peacocke development in Hamilton?
- 2) Are the FEW nexus and the Green Star frameworks relevant and useful planning tools for sustainable community development in New Zealand?

Chapters four and five revealed a number of diverse perspectives on creating sustainable community development. Competing values were evident in views on planning, housing design, development, planning shortfalls and the role of the banks, funders, local governments and developers. Prometheanism and economic rationalism discourses typically reflected the views of the HCCOs while CGIs generally expressed a macro-level critique of such a framing of society and called for the redefining of successful development that is not solely focused on economic growth and GDP. The perspectives identified in Chapter four also demonstrated the need for social and environmental considerations to be included in the regulatory frameworks of a development as well as exploring the calls for needing alternative housing models and designs which are able to cater for the community in ways such as: affordability, multi-generational living, ageing populations and accessibility. It also touched on the current shortfalls perceived by the CGIs and HCCOs when it comes to planning and the development industry. For CGIs, these largely focused on the need to reframe our thinking away from an economic focus, and on relaxing zoning amongst others. HCCO shortfalls centred around lengthy planning and framework processes and inconsistencies among overarching Acts and legislation while also highlighting the complexity of the housing development industry, particularly in terms of how such developments are shaped, influenced and at times manipulated by the various actors at play.

Chapter five presented an analysis of the imaginaries of sustainable communities, based on the interviews conducted for this research. Here, thoughts and ideas have imagined a scenario of what *could* be. Sustainable urban imaginaries were split into two competing ideas: transformative and

reform. Transformative imaginaries, largely expressed by the CGIs, demonstrate a radical revisioning of a society. Here, human-nature relationships, food resilience and community relationships become the centre-point for community design, whereas HCCO's interpretations accepted existing legislative and institutional structures, thus reflecting a 'reform' imaginary. Such ideas were confined to regulatory thresholds, consumption and pollution levels, economic aspects and, waste disposal. Such imaginaries progressed from innovative and energy-efficient building design to how community members could operate in their day-to-day lives. Challenges to creating a sustainable community were also discussed and centred largely around competing definitions of what a sustainable community entails, the responsibilities of local governments and community members in achieving this vision, as well as limitations to implementing such a vision in the context of the Peacocke development in Hamilton.

In response to the second question, discussed in Chapter six, both frameworks, despite their limitations, have the potential to be useful planning tools for sustainable community development in New Zealand in a different context. The perspectives identified in chapters four and five helped to identify the FEW nexus and Green Star Communities framework's usefulness in sustainable community design. Both frameworks had limitations in the unique context of the Peacocke development. The Green Star framework was recognized as influencing the way the HCCOs operate, but questions were raised about whether it had potential to challenge the current New Zealand building standards and codes. The usefulness of the FEW nexus largely depends on the variation of the nexus being used. Since it typically focusses on food, energy and water resources, a nexus that is inclusive of social livelihood aspects (such as the ELS FEW nexus defined by Biggs et al. (2015)) is preferred so that social inequalities or considerations are not ignored or worsened. The FEW nexus, however, has the potential to influence legislation and policy decision-making at a local and national scale while the Green Star framework has clearly demonstrated its ability to shift the mindset of HCCOs towards more holistic planning and thinking but would be most influential if utilized in collaboration with Green Star Design & As Built, Interiors and Performance.

The challenge in comparing criteria and indicators in the FEW nexus and Green Star (or any other assessment tool) is that different tools and frameworks have different values inherent within them and "different parties have diverging viewpoints and opinions about the weighting of different indicators and criteria" (Haapio, 2012, p. 169; Haapio & Viitaniemi, 2008). Actors in urban development, the building sector or even the community value issues differently and, as seen, also approach these planning challenges through different lenses and discourses. However, to achieve greater resource efficiency and to meet the criteria set above as to what makes a sustainable development and community, it is clear that significant policy development, research and action is

needed across multiple scales. It has also become evident that the influence that elected members have on council projects is important. The current government has demonstrated the desire for engagement with the community, and the re-focusing on the four well-beings in the Local Government Act has fundamentally changed the way that HCC operates (HCCO1, HCCO3). It can be particularly challenging trying to meet sustainable or community-focused goals within a government that is not supportive of such as HCCOs become restricted in where they can go with their thinking. However, when decision makers are encouraging and supportive of that, it empowers staff to be able to achieve much more.

In either scenario, whether utilising the FEW nexus or the Green Star tool, it ultimately reflects the state of the region that it is in, and it depends on building culture, way of living, building codes, regulations and national standards. However, no urban or city region can achieve sustainability on its own. Regardless of environmental or housing policies and local land uses, “a prerequisite for sustainable cities is sustainable use of the global hinterland” (Rees & Wackernagel, 2008, p. 236). Cities and the people within them play a critical part in aiding to achieve global sustainability. Of course, with all the various frameworks and tools available, assessments and standards between them can be confusing to ascertain. Questions can therefore arise such as *‘is the full-nexus synergy the same as a 6 Green Star rating?’* Or *‘are the tools or standards assessed by each the same?’*. These are questions which cannot be answered within the scope of this study. However, transparency between rating tools and having common metrics or standards for key issues such as greenhouse gas emissions have the potential to aid in making such assessment tools more useful in the market and competitive to one another (Reed et al., 2011).

Significance of the findings

This study attempted to determine whether the FEW nexus and Green Star Communities frameworks could be used as tools for sustainable community development within the context of the Peacocke project in Hamilton, New Zealand. While the unique context of the development hindered the ability to fully apply each framework to the case study, it has clearly demonstrated the challenges faced by development frameworks in implementing sustainable development.

It has also contributed to the scholarship on urban sustainable design in New Zealand as the FEW nexus framework has not been used in the New Zealand context before and there have only been a handful of Green Star Communities projects certified in New Zealand.

While, in this instance, the frameworks have been unable to integrate fully with the development, communities are not always able to fully integrate, or be represented by, frameworks either. This study has highlighted the diverse perspectives surrounding sustainable community development and,

in turn, the difficulties of fitting these perspectives into any given development framework. It has thus reinforced the need for community perspectives, ideas and thoughts to be recognized and included in community planning.

It is also evident that the Peacocke development is being shaped by various factors: the HIF funding from the government which is funding, and therefore shaping and limiting, the infrastructure of the development; the Peacocke Structure Plan developed by the HCC; legislation such as the RMA and Buildings Codes etc.; and, developers who have, in their own way, manipulated and influenced local or district Area Plans. The ability for legislation to, at times, contradict one another further complicates the issue of local governing body's trying to enforce developers to implement sustainable practices.

Lastly, this study has found that both the ELS FEW nexus and the Green Star Communities framework have potential to be used as frameworks to guide sustainable community development in New Zealand. The FEW nexus has the potential to influence legislation and policy decision-making at a local and national scale while the Green Star framework has clearly demonstrated its ability to shift the mindset of HCCOs towards more holistic planning and thinking. If used in a more appropriate context, or alongside complementary tools such as the Green Star Design & As Built, Interiors and Performance, both frameworks can become useful frameworks in New Zealand.

Limitations of the research

One limitation of this research was the inability of both the FEW nexus framework or the Green Star Communities framework to fully work in the unique context of the case study. While this did allow for added discussions surrounding the critiques and limitations of the frameworks, I think it would have been useful to have been able to do an in-depth analysis of either framework using a more appropriate case study. This would have allowed me to do an in-practice assessment of either framework in action.

A second limitation to the study is the lack of developer perspectives. Since developers play such a key role in both designing and developing communities, as well as influencing and manipulating District Plans, it would have been worthwhile to have gained their perspectives on planning frameworks, what makes a sustainable community and sustainable legislation. Attempts to interview developers for this research were not successful.

The community groups interviewed were generally groups or individuals committed to social justice perspectives and diverse notions of environmental and social sustainability. As such, it may not be surprising that their comments have reflected an awareness of how politics work and the difficulties of enabling systemic change that is confronted at a local level but is reflective of larger national patterns.

Finally, the limited timeframe of this research and having only one year to complete the study meant that other information or development frameworks could not be utilised to create a more thorough and in-depth assessment. Furthermore, the concise scope of this research did not allow me to do a thorough assessment of the local and national Acts, policies and frameworks which shape development in New Zealand. This would have been a useful way in which to identify the inconsistencies between the Acts.

Future research areas

This research touched on two topics of interest, namely: sustainable community imaginations and sustainable development frameworks (FEW nexus and Green Star). In terms of the Green Star Communities framework, future research could include an assessment of the usefulness of the framework in a context different to that of this case study. A case study where the framework is being used on all aspects of the development (Infrastructure, Design & As Built, Interiors and Performance) would be useful to ascertain its usefulness when all aspects of the development are considered together. Furthermore, research comparing the benchmark standards between NZGBC and GBCA would provide an insightful indication as to whether the Green Star benchmarks are, in fact, better than current development standards.

Similarly, a FEW nexus assessment could be carried out on a more appropriate stand-alone development to determine its usefulness in practice. Utilizing the ELS FEW nexus model to carry out this investigation will also aid in establishing whether the ELS version of the FEW nexus model does accurately translate into improving livelihood security. If so, the ELS FEW nexus could become a key framework in managing the trade-offs between resources and social livelihoods in future developments.

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