Exploring shared impact measurement: developing a framework for future action for the Zero Waste Network Aotearoa

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Abstract

The Zero Waste Network (ZWN) represents community resource recovery enterprises (CREs) working to shift communities towards a circular economy via zero waste education, reuse and recycling activities in Aotearoa New Zealand. The CRE model produces a range of impacts, however there is currently no standardised approach to reporting these. This thesis aims to develop a framework of action towards the implementation of shared impact measurement within the ZWN.

It was found that research participants understand and communicate CRE impact in a variety of ways. It is proposed that there are environmental, cultural, social and economic dimensions to CRE impact. These are explored and analytical and reporting tools are presented for each.

Aiming to have practical application within the ZWN, this thesis uses an action research approach, involving ZWN members in its design and implementation. Interviews, a survey and focus groups were undertaken, allowing for a variety of qualitative and quantitative data to be collected. These were analysed using coding and basic statistical analysis methods.

Key words: Impact, zero waste, community resource recovery, circular economy, action research

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Abbreviations

AR	Action research
CO2	Carbon dioxide
CRE	Community Resource Recovery Enterprise
FTE	Full-time equivalent
GHG	Greenhouse Gas
MFE	Ministry for the Environment
PAR	Participant Action Research
WRAP	Waste Resources Action Programme
ZWN	Zero Waste Network

"No one can define or measure justice, democracy, security, freedom, truth, or love. No one can define or measure any value. But if no one speaks up for them, if systems aren't designed to produce them, if we don't speak about them and point toward their presence or absence, they will cease to exist."

– Donella H. Meadows

Chapter 1. Introduction

> *"Waste is a global issue. If not properly dealt with, waste poses a threat to public health and the environment. It is a growing issue linked directly to the way society produces and consumes. It concerns everyone"– (UNEP, 2015 p.2).*

1.1 Overview

Annually, the world generates an estimated 2.1 billion tonnes of waste. This is expected to grow to 3.40 billion tonnes by 2050 under a business-as-usual scenario (Kaza; Yao, Bhada-Tata & Van Woerden, 2018, p.17). In Aotearoa New Zealand, the total amount of waste disposed of in municipal landfills each year is an estimated 740 kg per person, a total of 3.68 million tonnes (MfE, 2019, p.14). This is increasing annually, with a 48% increase over the last 10 years (Sage, 2020).

The problem with waste is generally summarised as twofold - 1) the negative impacts it can have on people and the environment, and 2) the additional strain on resources in inefficient, wasteful systems. An often-quoted example of the first point is that by 2050, the ocean is expected to contain more plastic (by weight) than fish (Ellen McArthur Foundation, 2016, p.17). This is due to the 8 million tonnes of plastics that end up in the ocean each year. The same research offers an example of the second point, calculating that over 90% of plastics produced are derived from virgin fossil feedstocks, with only 15% collected for recycling (Ellen McArthur Foundation, 2016, p.17).

On the other hand, waste also represents a massive opportunity. Zero waste is an approach that envisages a world where nothing is wasted and all resources are valued and reclaimed. A zero waste approach is concerned with changing the current waste management system across a range of levels in society, including the institutions that set the social, economic and political structures we live within; the infrastructure and systems needed to undertake waste management activities, and; the behaviour of groups and individuals (Zaman, 2015, p.14; Abson, Fischer, Leventon, Newig, Schomerus, Vilsmaier, von Wehrden, Abernethy, Jager & Lang, 2017, p.33).

The Zero Waste Network (ZWN), represents an historically important part of the diverse global zero waste movement that is concerned with achieving a zero waste world. ZWN also makes a critical contribution within the Aotearoa New Zealand waste sector. Members of ZWN are community organisations working towards zero waste through reduction, reuse and recycling activities, and are referred to throughout this research as Community Resource Recovery Enterprises (CREs). As a group with a strong history of collaboration (Trotman, 2018, p.5), and with significant drivers for communicating the effectiveness of their work, ZWN members are good candidates for the development of a shared model that collects, analyses and presents data about their impact collectively.

This research employed an action research methodology, creating arenas for dialogue and mutual learning between the participants and researcher, using multiple data collection methods including semi-structured in-depth interviews with key stakeholders, a survey of ZWN members, and focus groups, with the aim of developing framework of action for the development of a shared impact methodology for the ZWN.

The lack of data collection and analysis in Aotearoa New Zealand's waste sector is a widely acknowledged challenge that "hampers our ability to plan appropriate activities to improve waste management and minimisation" (Ministry for the Environment (MfE), 2010, p.3). This has been recognised as a significant obstacle to good waste management in Aotearoa New Zealand for many years (Parliamentary Commissioner for the Environment, 2006, p.5). This research aims to address the challenge of limited data by exploring the contribution of the community sector to waste minimisation in Aotearoa. Because of the broader social and environmental missions ZWN members seek to achieve, this research will also offer insight into their contribution to issues such addressing climate change and local economic development outcomes. It will also have the potential for use outside of ZWN. For example, for charities that run opportunity shops there may be significant value in robust tools that allow them to report on the reuse activities. The research is also timely in respect to a number of central government initiatives, such as Statistics New Zealand's Ngā Tūtohu Aotearoa – Indicators Aotearoa New Zealand project which includes several waste related measures, but currently lacks a methodology for how to report on many of these.

In Aotearoa New Zealand, waste management activities are undertaken by public, private and community actors.For example, ZWN is a charitable trust and can be considered as a community actor. This is also true for the majority of ZWN members who are small-medium organisations, operating under a community enterprise model that pairs a social and/or environmental mission with income generation via trading activities. The range of waste related activities undertaken by ZWN members is comprehensive - from waste avoidance education and advocacy, to recycling collections, to landfill management.

With over 100 members operating across Aotearoa New Zealand, ZWN offers a useful starting point for the development of a shared impact measurement methodology. Shared measurement would allow for the collective impact of Aotearoa New Zealand's community resource recovery sector to be further understood and communicated, and could offer opportunities for ZWN members to identify and strengthen best practice. Work on developing a sector-led approach to impact measurement began several years ago when ZWN members were engaged in a series of workshops and meetings. Initial research conducted in 2018 identified three dimensions of impact for further study: environmental, social and local economic impacts.

1.2 Motivation for the study

As community organisations, ZWN members have significant drivers for collecting and communicating data on the individual and collective impact they are having as a sector: it gives community stakeholders reasons to engage with their work, provides funders an understanding of the results their investments are having and guides internal decision-making and direction-setting.

Shared impact measurement is a collaborative approach to the collection, analysis and presentation of data about the difference being made by a group of organisations that have similar goals (Big Lottery Fund, 2015, p.4). A shared approach to impact measurement offers economies of scale, the ability to benchmark across a whole sector, and potential to develop best practice strategies and standards. Adopting a shared approach to impact measurement will also enable CREs to gain important insights into the effectiveness of a range of resource recovery activities that are not currently

considered a priority by the wider waste management sector. For example, while reduction and reuse activities sit at the top of the waste hierarchy with the largest potential for achieving diversion, the focus of the waste management sector is generally recycling and disposal (Bartle, 2014, p.5). Without profit or regulatory incentives for undertaking reduction and reuse, these activities are not commonly reported on or well-understood by the broader waste sector.

Shared impact measurement frameworks have been developed and used by CREs in other countries including Australia, the UK and the US (Allen, 2018; WRAP, 2011; Fortuna & Castaldi, 2016). While these offer important insight into the process of developing an appropriate and effective framework for the ZWN, none fully align with the priorities of the Aotearoa New Zealand context, as identified by ZWN members. Literature on collective impact processes indicates that a 'backbone organisation' is important to the development and ongoing success of shared impact methodologies (Hanleybrown, Kania, & Kramer, 2012, p.1). With 100+ members, and experience in developing and managing collaborative projects across its membership, ZWN is well placed to take on this role, bringing together multiple parties to create a framework that is grounded in the needs and practical realities of members, and the specific context of resource recovery in Aotearoa.

1.3 Research questions

The aim of this research is to develop a framework of action towards shared impact reporting for the Zero Waste Network. The central research question that this thesis seeks to address is: What is an appropriate and effective framework for assessing the shared impact of the Zero Waste Network?

In exploring how to define 'appropriate' and 'effective' in this context, the following supplementary questions will contribute to answering the main research question:

1. What methodologies and tools exist for gathering data on impacts in the CRE sector?
2. What measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work?

3. What are practical and resource considerations that should be taken into account when designing a shared impact methodology for the ZWN?
4. Which existing impact measurement tools fulfil the needs of ZWN members?

1.4 Research approach

This research employs an action research approach. Action research is a form of deliberate and systematic inquiry conducted by or with 'insiders' to a community or organisation (Herr & Anderson, 2005, p.3). Action research has a practical orientation and focuses on dealing with issues, problems, concerns and needs 'in the real world'. This approach was chosen because I am currently employed as the Executive Officer of ZWN, a role I have held for the last eight years. Within an action research framework, the researcher can be considered as an knowledgeable 'insider', as well as functioning as an objective, independent coordinator of the research project.

This research seeks to develop a practical pathway of potential action for ZWN in regard to how the impacts of their work are measured, analysed and reported. In order to do this, the research prioritises understanding the meaning that the various members of ZWN place on the concept of 'impact' and the value that their work has.

This research applies a mixed method strategy, using semi-structured interviews, a survey and focus groups. Initial interviews with stakeholders aligned with the community waste sector helped frame the structure of the subsequent stages of the research. ZWN members were then invited to participate in an online survey comprising a range of Likert scales and open-ended questions, providing insight into their current reporting and impact measurement practices. The survey process also sought to gather data on how participants prioritise different types of impact reporting, audiences, and a range of practical aspects of an impact reporting framework from member's perspectives. Finally, a series of focus groups were conducted with ZWN members to obtain a more in-depth understanding of the practitioner perspectives on three specific issues. The data was analysed utilising quantitative and qualitative methods, including coding of qualitative data using manual and electronic methods to discover trends and to identify divergent opinions. Quantitative methods included basic aggregation, synthesis and visualisation.

1.5 Positionality

The way that researchers view and interpret the world is influenced by their position within it. The researcher's social and political contexts potentially shape the research in a number of ways - from the topic chosen, the questions asked, how participants are approached and interacted with and how the data is interpreted (Lu & Hodge, 2019, p.225). Reflecting on one's positionality can be an important process for researchers in understanding and addressing the power relationships in the research and can enhance insight during the analysis phase (Jacobsen & Mustafa, 2019, p.1).

As an employee of ZWN, my position throughout this research inquiry was as an insider researcher, rather than an outsider who was entirely detached from the research subjects. Instead, I have extensive first-hand knowledge of the setting in which the research takes place, and existing relationships with the participants. This is both a strength and also a potential weakness of the research model, which needs to be understood, and where necessary, mitigated. My knowledge of conversations happening within the network was the main reason to consider shared impact as a topic for research in the first place. Throughout the research process I have discussed my study and gathered data relevant to the topic from these interactions.

A number of measures have been undertaken to mitigate insider bias. Regular self-reflection and conversations with my supervisors were important, as was my professional interactions with other organisations in the community and waste sectors. ZWN works with a number of organisations and agencies, for example WasteMINZ, the Ministry for the Environment, Environment Hubs Aotearoa, Community Energy Network, Ākina and the Sustainable Business Network. These are a way of reality checking, strength-testing and grounding my perspective as a researcher and minimising insider bias.

1.6 Significance of the study

The results of the research will make a significant contribution to the development and adoption of a shared impact methodology that can be deployed across the ZWN. While the ZWN membership base is significant, it does not represent the entire community

waste sector. However, because the level of representation is high the findings will be indicative of the whole sector and will strongly reflect the value of its contribution to New Zealand's overall waste minimisation. In addition, an impact methodology developed for, and with input from, ZWN members is likely to have relevance to non-members who are engaged in similar activities. For example, charities that run opportunity shops may be interested in a methodology that gives them information on the impact of their reuse activities. The outcome of this research, in contributing to quantifying and reporting the value of the impact of ZWN, has the potential to play an important role in unifying and raising the profile and esteem of the entire community resource recovery sector.

Another important aspect of this research is the extent to which it is focused on reduction (behaviour change) and reuse activities. This is significant as most waste data is focused on the bottom of the waste hierarchy (Bartl, 2014, p.5; Allen, 2018, p.15). Change at the top of the waste hierarchy can reset outcomes across a products lifecycle, so carries great resonance, amplifying savings in waste services and infrastructure.

1.7 Thesis outline

This thesis is organised into seven chapters. Following this introduction, Chapter 2 provides background information on the concept of zero waste and describes New Zealand's community waste sector, the Zero Waste Network, and its members. The work that has been undertaken by ZWN to progress the development of a shared impact framework, but is distinct from this research, is also explained.

Chapter 3 reviews relevant literature to address the first research question. This review is focused on the concept of 'impact' and how approaches to evaluating and reporting on impact has developed over time. Four types of impact (social, economic, environmental and economic impacts) are explored, with a focus on how these have been assessed in other impact frameworks internationally, and the elements required to make a robust framework that is appropriate to the context of Aotearoa New Zealand.

Chapter 4 describes the action research approach taken in this research, and the methods used for data collection and analysis. It provides an overview of the participants in the study, and the ethical issues that were considered during this research.

Next, Chapter 5 presents the results of the data collection and analysis. It provides examples of the learnings that came from the action research approach, as well as identifying key themes in the data from each phase of the data collection. Chapter 6 then addresses the final three research questions within the context of the literature, and the data presented in Chapter 5. It synthesizes these learnings into a framework for future action.

Finally, Chapter 7 concludes this thesis with a brief exploration of the academic and practical implications of this research, its limitations and possible future directions.

Chapter 2. Background

2.1 Introduction

This chapter introduces key concepts relevant to the research, as well as providing a brief overview of some of the key contextual factors. It is divided into three main sections. First, Section 2.2 describes the concept of zero waste, including from a te ao Māori perspective. Next, Section 2.3 describes the Zero Waste Network and its members and their role as a part of the waste management sector in Aotearoa New Zealand. Section 2.4 then provides a basic definition of 'impact' and describes the ZWN's previous work on impact measurement.

2.2 Zero waste

Waste, and the task of managing it, is global and ubiquitous (Wishart, 2015, p.12). In the last 100 years rising populations, economic growth, urbanization, and the advent of cheap mass-produced items have resulted in a very different scenario in regards to waste generation than any other time in human history (Mauch, 2016, p.5).

Currently, the world generates 0.74 kilogram of waste per capita per day. This is estimated to increase to as much as 1.87 kilogram of waste per capita per day by 2050 (Kaza et al., 2018, p.17). Peak waste is not expected until around 2100, at which point solid-waste generation rates will exceed 11 million tonnes per day (Hoornweg et al., 2013, p.615). This increase in waste generation is increasing more rapidly than the generation of other environmental pollutants, including greenhouse gases (ibid, p.615).

Poorly managed waste can pollute air, soil and water with material, particles and/or leachate, with potentially significant downstream effects. For example, in the Agbogbloshie scrap yard in Accra, Ghana, the open burning of electronic waste as part of the recycling process has caused serious health impairments in the 10,000 people who gain their livelihoods from sorting and recycling UNEP, 2015, p.17). Greenhouse gas emissions from solid waste treatment and disposal is estimated at 1.6 billion tonnes of

carbon dioxide equivalent greenhouse gas emissions annually (5% of global emissions), which is anticipated to increase to 2.6 billion tonnes of CO2-equivalent per year by 2050 if no improvements are made in the sector (Kaza et al., 2018, p.5). Waste disposal sites can provide breeding grounds for insects, vermin, and scavenging animals, resulting in air and water borne diseases - UN Habitat research has shown that the incidence of diarrhoea is twice as high and acute respiratory infections six times higher in areas where waste is not collected frequently compared to areas where collection is frequent (Hoornweg & Bhada-Tata, 2012, p.25). Managing waste is also expensive: solid-waste management is one of the greatest costs to municipal budgets (Hoornweg et al., 2013, p.615). In 2010 the global solid waste management costs were estimated to be $205.4 billion dollars annually, and is estimated to increase to $375 billion by 2025 (Hoornweg & Bhada-Tata, 2012, p.46).

The consequences of poor design and management in waste are also evident locally. In March 2019, on the West Coast of the South Island, part of the legacy landfill beside the Fox River was washed downstream during a significant rainfall event. 135,000kg of plastic and other waste was exposed and swept over an area of approximately 2100 hectares of coastline and river banks (Law, 2020). With an estimated 110–163 closed landfills vulnerable to climate-induced sea level rise, the Fox River flood highlights a possible future for Aotearoa New Zealand and illustrates the kinds of intergenerational problems that arise from current waste management practices (MfE, 2019, p.15). These practices are based on a linear ‘make-use-waste’ system, in which raw materials are extracted and manufactured into goods, which are sold and consumed, before being thrown ‘away’ and disposed of via landfilling or incineration.

This system is increasingly recognised as being unsustainable. For example, the Colmar Brunton Better World report (2019, p.8) found that the build up of plastic waste was the number one concern for the New Zealanders surveyed. At an international level, the United Nation Environment Programme considers sustainable waste management to be one of the most important global environmental agendas in the twenty-first century (UNEP, 2012, p.4). As concerns about the environmental consequences of inadequate waste management practices grow, zero waste strategies are increasingly considered as best practice for waste management (Zaman & Swapan, 2016, p.32).

Zero waste represents an alternative to the current model of waste management. It is a holistic approach to waste management which considers the whole life cycle of a product from the extraction of resources to the final disposal (Zaman, 2015. p.15). Zero waste is the central concept to the mission, purpose and activity of ZWN. It can be defined as the "conservation of all resources by means of responsible production, consumption, reuse, and recovery of products, packaging, and materials without burning and with no discharges to land, water, or air that threaten the environment or human health" (Zero Waste International Alliance, 2018). This perspective sees the materials and products that we use to live our lives as resources that are to be valued. The goal of zero waste is to minimise and ultimately eliminate waste (ZWN, 2019, p.12).

Dr Paul Palmer coined the term 'zero waste' in the 1970's as part of his work recovering chemicals associated with the technology emerging out of Silicon Valley (Mauch, 2016, p.6). Today, it is at once a conceptual proposition and a set of practices, processes and policies (Wishart, 2015, p.18). For ZWN, zero waste is more than a goal or a range of technical solutions to minimise waste. It is also about creating strong communities. The ZWN manifesto document states "social connection and inclusion are at the heart of resourceful communities" (ZWN, 2019a). It is an innovative and inclusive concept that puts social and environmental justice and solidarity at the forefront (Gutberlet, 2016, p.58).

2.2.1 Systems change

Like other complex issues such as climate change, food resilience and biodiversity loss, waste management has a number of interacting biophysical, social, economic, legal and ethical facets, with significant spatial and temporal variability, and crosses disciplinary boundaries (Abson et al., 2017, p.30). Addressing such issues represents a significant challenge and requires the involvement of many sectors and stakeholders (Taelman, Tonini, Wandl & Dewulf, 2018, p.1). As summarised by Mauch:

> "the transition to zero waste does not occur in a vacuum and cannot simply be legislated into existence. It requires the input of all actors in society working towards a common objective. While changes in cultural values are essential for

achieving zero waste, these changes are meaningless if the institutions in place hamper rather than foster our progress" (Mauch, 2016, p.9).

The US based CRE, Eco-cycle, illustrates the key features of a zero waste system as a series of interconnected parts as illustrated in Figure 2.1 above.

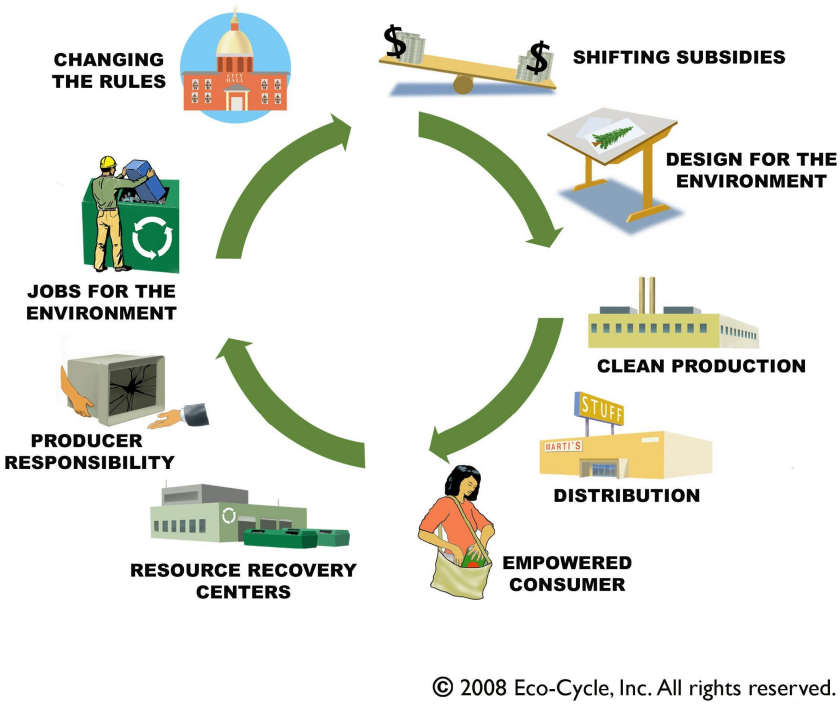


Figure 2.1: The key features of a zero waste system (Eco-Cycle Inc, 2008)

Similarly, ZWN has developed a model to illustrate where opportunities for change towards zero waste can be found (as illustrated in Figure 2.2) that includes interventions at multiple points in the system:

1. Activities and infrastructure: Things that people do everyday to shape behavior which may also help change attitudes, values and behaviour over time, as well as the places and systems that enable people to undertake those behaviours.
2. Processes and flows: Relationships between people and organisations and flows of money, energy and resources.
3. Social structures and institutions: Formal organisations create frameworks for action (and inaction) and channel information flows. These can be based in government, business or civil society.

4. Mindset: Underlying beliefs about what you are trying to do, which set the direction and framework for decision making and determine priorities, individually and across groups of people.

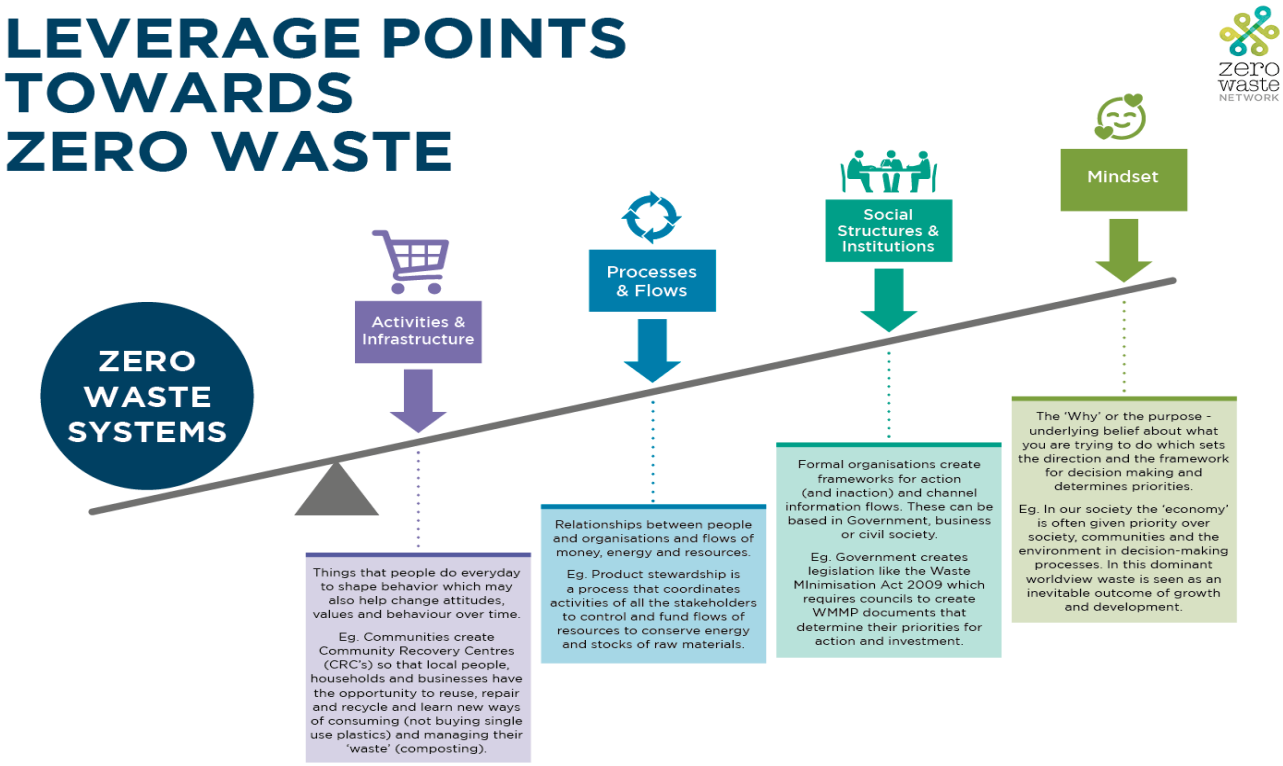


Figure 2.2 Leverage points towards zero waste (ZWN, 2020d)

2.2.2 Zero waste and a circular economy

An overlapping and synergistic concept with zero waste is that of a circular economy. Just like zero waste, the focus of a circular economy is on eliminating waste and optimising the use of natural resources (Lombardi, 2016). The Ministry for the Environment defines a circular economy as:

> An alternative to the traditional linear economy in which we keep resources in use for as long as possible, extract the maximum value from them whilst in use, then recover and regenerate products and materials at the end of each service life. When a product is designed for the longest use possible, and can be easily repaired, remanufactured or recycled (or used, composted and nutrients returned) we consider it to have a circular life cycle. A circular economy is fueled by renewable energy." (Ministry for the Environment, 2020b).

The Ellen MacArthur Foundation (2020) describes the flow of materials through a circular economy, with the aim of minimising leakage of materials out of the system, as well as negative externalities. They define materials as either being part of a biological cycle (e.g. food waste, wood waste) or the technical cycle (e.g the plastic and metals used in computers). This is illustrated in Figure 2.3 below. Lombardi (2016) identifies large manufacturers as the early drivers of circular economy activities, seeking efficiency and savings from the reduction of waste.

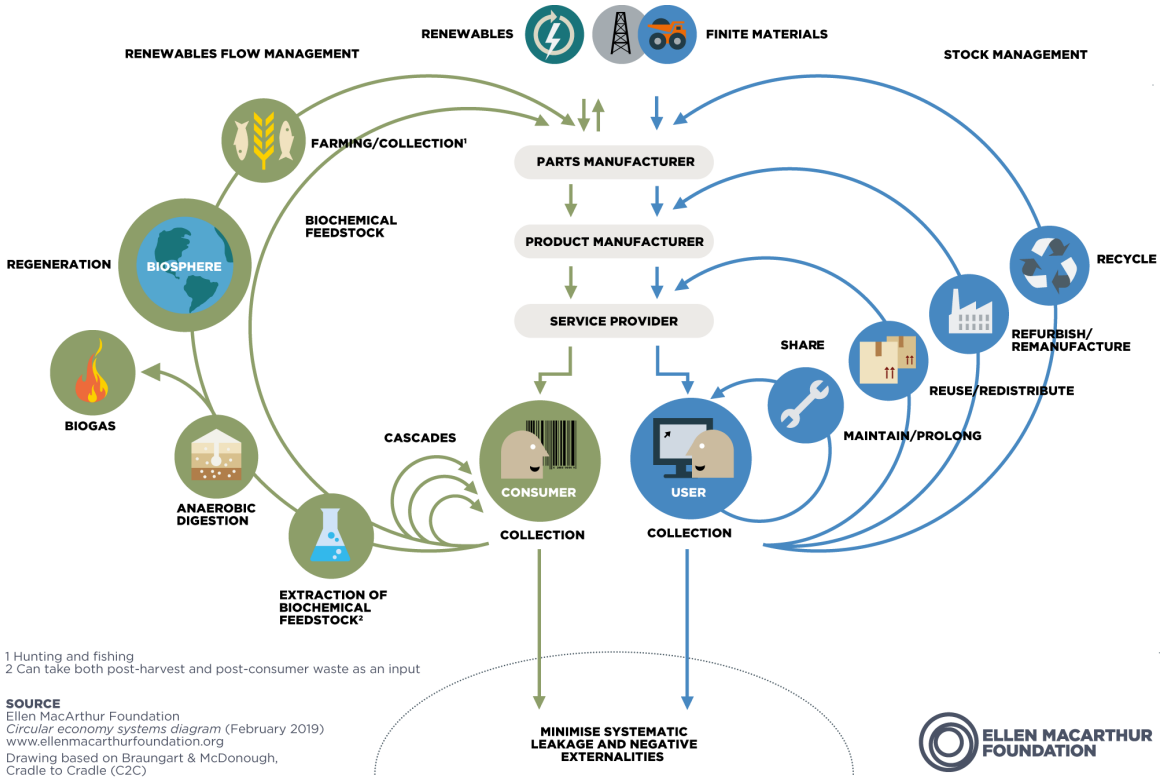


Figure 2.3: Flows through the biological and technical cycles in a circular economy (Ellen MacArthur Foundation, 2020)

If, as a World Bank report suggests "waste is mainly a by-product of consumer-based lifestyles that drive much of the world's economies" (Hoornweg, & Bhada-Tata, 2012, p.3) a circular economy will require more than different business models. Zero waste encompasses a paradigm shift away from unsustainable consumerism and discard-oriented production and consumption patterns (Gutberlet, 2016, p.58). ZWN developed its own definition of a circular economy that incorporates the aim of zero waste as a vehicle for building stronger communities and addressing inequality:

> A zero waste circular economy is one that recognises the intrinsic value of all living things and the ecosystems that sustain life. It creates strong, resilient and equitable communities where people have what they need to live happy and fulfilling lives.
>
> In a circular economy waste has been designed out of the system, no excess is produced and all resources are recovered. A circular economy is restorative and regenerative by design.
>
> A circular economy conserves energy and has transitioned to renewable energy. It is built on a just foundation, with control of resources, production and distribution at the lowest possible level for collective benefit. The circular economy is a human system that values and supports caring, compassion, sharing, equity, peace and justice. (ZWN, 2019, p.12)

2.2.2 The waste hierarchy

A zero waste approach minimises waste, reduces consumption, maximises recycling and ensures that products are made to be reused, repaired, recycled or composted. A guiding concept is that of the waste hierarchy, which provides a framework for establishing the order of preference for different waste management options. The hierarchy draws on the precautionary principle (in that reducing waste causes less harm to people and/or the environment than putting it into landfill will). There are many versions of the waste hierarchy. ZWN's version includes six categories (as illustrated in Figure 2.3). These include:

1. **Reduce:** Reducing the amount of waste produced. If we don't accept or use products that become waste, we reduce resource consumption and prevent those materials from entering the waste stream in the first place. Designing products to last and/or with the recovery of resources in mind is an important aspect of reduction.
2. **Reuse:** Using materials and products over and over for the purpose for which they were designed.
3. **Recycle & Compost:** Sorting and processing materials so they can become feedstock for another product.
4. **Disposal & Unacceptable:** Those materials that are left after reuse and recycling, are disposed of. In Aotearoa New Zealand, landfilling is the most common

disposal option. In other places, incineration of waste is another common pathway, including waste to energy projects. However, zero waste focused groups such as the Zero Waste International Alliance and ZWN identify incineration and waste-to-energy as unacceptable, due to the significant negative impacts on human health, comparably low number of jobs created, large capital investment with low return, and an ongoing landfill requirement for the remaining waste left over from incineration (ZWN, 2020c)

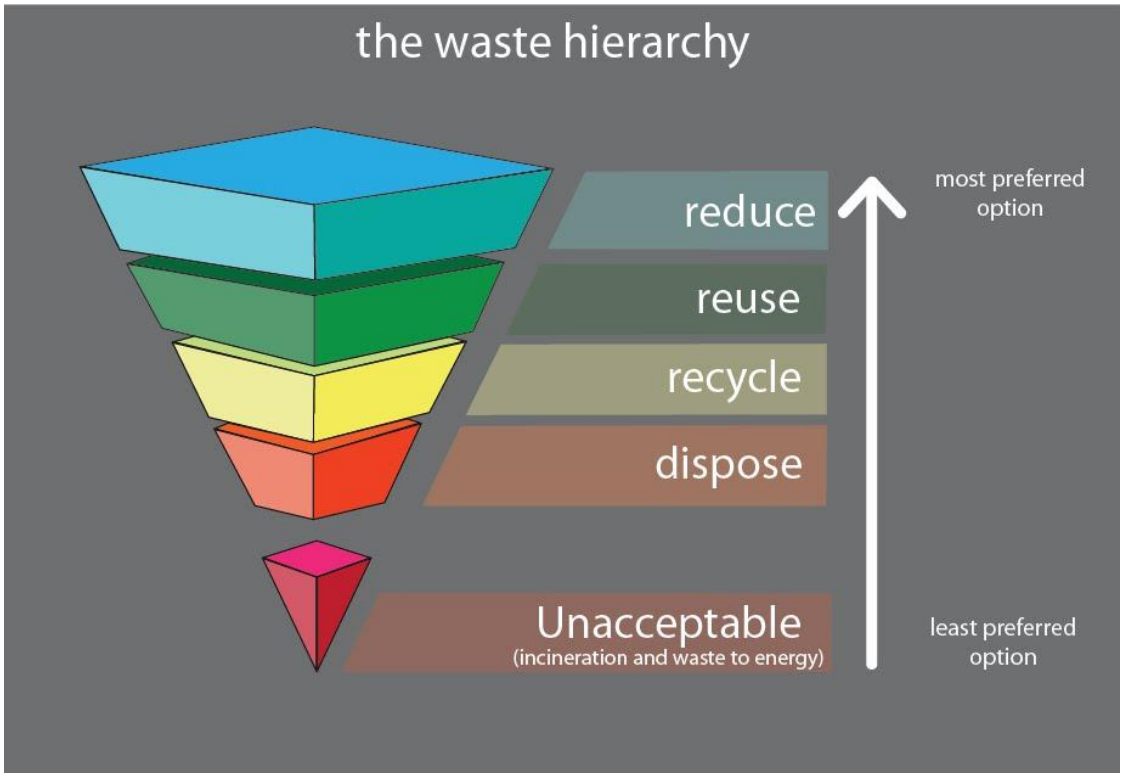


Figure 2.4: ZWN's version of the waste hierarchy (ZWN, 2020e).

2.2.2 Te ao Māori and para kore

"Humans are the only species on the planet that don't live by zero waste principles. The natural world does not create waste. Everything at the end of its life, whether it's a plant or animal, becomes part of another system. A dead insect becomes kai for another insect, a tree that falls in the bush rots and provides nutrients to the earth for new growth. Everything in nature is part of a closed, continuous, endless cycle" (Para Kore, 2020).

Given that this research takes place in Aotearoa New Zealand, it is important to discuss the perspective on para kore (zero waste) that exists from a te ao Māori perspective (the Māori worldview). Mātauranga Māori (Māori knowledge & philosophy) is a unique body of knowledge, developed and practiced over thousands of years, that includes a sophisticated form of resource management (EXITO, 2009, p.1). Integral to this perspective is a holistic and interconnected relationship with the natural world and its resources (Harmsworth & Awatere, 2013, p.274). A traditional Māori worldview considers people as a part of the natural world, tracing their origin back to Papatūānuku (the earth mother) and Ranginui (the sky father), and a range of gods (e.g. Tangaroa, god of the oceans, Tāne mahuta, god of the forests), from which a relationship to all living things exists (ibid, p.274).

Within the context of this whakapapa (genealogical) relationship to the natural world, resource use and waste management are linked to people's cultural and spiritual well-being, as well as that of the health of ecosystems (Harmsworth & Awatere, 2013, p.274). The concept of para kore reflects Māori tikanga (practices) and kaupapa (principles or policies). Some of the main te ao Māori principles relevant to para kore are:

- Kaitiakitanga (guardianship) of the natural environment. This is related to respect for the mauri (internal energy or life force) of Papatūānuku, Tangaroa and other gods, as well as the whakapapa connections between humans and ecosystems (Harmsworth & Awatere, 2013, p.274). The intergenerational protection of highly valued parts of nature and places that is passed on from one generation to the next, in a caring and respectful manner, exists within the concept of taonga tuku iho (ibid, p.274).
- Rangatiratanga (self-determination) is relevant to the zero waste model being employed in local communities with mana whenua involvement, and the recognition that communities have the potential to solve their own problems (Trotman, 2018, p.7).
- The fostering of atawhai (kindness and generosity) and manaakitanga (hospitality and support) between people and the environment through sharing cultural knowledge and traditional practices which ensure nothing is wasted.

- The value of kotahitanga (unity, collective action) outlines a priority to develop partnerships and restore the mauri of Papatūānuku, and the incorporation of mātauranga Māori into waste minimisation practices (Auckland Council, 2018, p.28).
- Whanaungatanga (kinship, connection) is an important value behind the collective action of multiple communities and organisations working to achieve zero waste.
- Respect for and adherence to tikanga. A long held history of tikanga that prioritises the separation of waste streams, especially from the food chain (Pauling, 2005, p.5).

2.3 The Zero Waste Network

In Aotearoa New Zealand part of the community resource recovery sector is represented by the Zero Waste Network. ZWN members are small to medium organisations, often operating under a community enterprise model that ties achieving a social and/or environmental mission with trading activities. ZWN members undertake a comprehensive range of waste related activities - from waste education and advocacy, to recycling collections, and even landfill management. Figure 2.4 illustrates the key players and interactions across the waste management sector in Aotearoa New Zealand.

The Zero Waste Network was established in 2006 and is a charitable trust representing community enterprises across Aotearoa who are working in the resource recovery sector. ZWN's organisational mission is to "connect, educate, enable and inspire members to reach their zero waste goals and to be a unifying voice at local, regional and central government levels around waste and community enterprise issues" (ZWN, 2018a). The network has 107 members. Including 61 full members. These are community organisations working on waste minimisation and resource recovery locally, regionally, and/or nationally. The other 46 members are associates. Including 5 individuals, 11 councils and 30 commercial businesses (ZWN, 2020a).

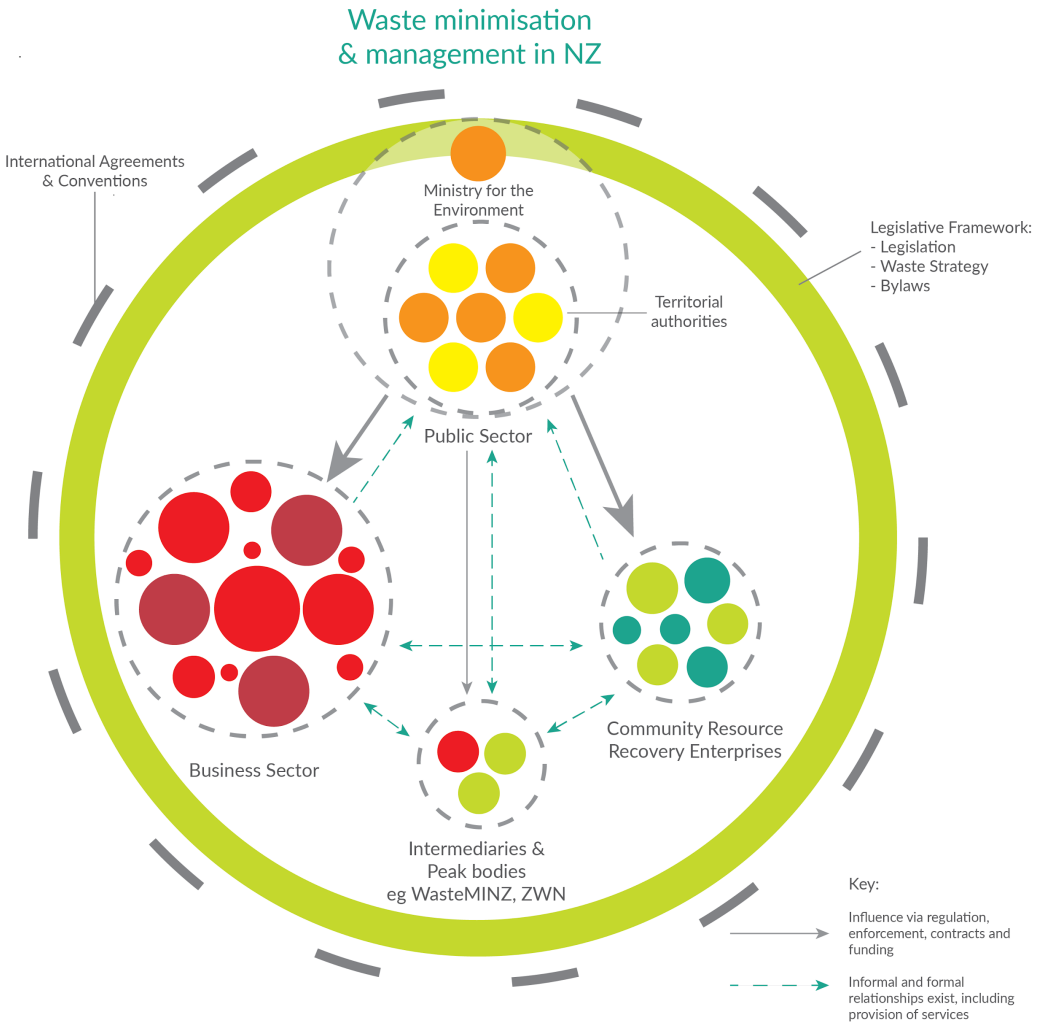


Figure 2.4: Key sectors and interactions in the New Zealand waste sector.

2.3.1 Community resource recovery enterprises

The network is part of what is referred to as the community waste sector: "community-based organisations concerned with waste reduction, re-use and recycling, either through the delivery of services and/or through educational and campaigning activities on waste issues" (Brooke Lyndhurst, 2007, p.7). Community resource recovery enterprises (CREs), operate within the broader waste management sector, involved in many of the same activities as commercial and public-sector bodies, but with a specific organisational structure and mission focus that render them distinct. Commonly, this is a 'community enterprise' structure that ties a social purpose with the trading of goods and services to create a surplus in order to fund organisational activities. Another common structural feature of organisations in the community waste sector is a charitable purpose, whereby

organisations fund their activities, partially or fully, with grants and/or donations, and often incorporating volunteer positions into their workforce.

The definition of the community waste sector employed above encompasses a wide spectrum of organisations. The difficulty in defining the boundaries of the sector means that detailed and comprehensive data on the size and characteristics of the sector is not readily available, nationally or internationally (Hines, Morley, Frater, Cartwright & Chandrashekar, 2008, p.25). Currently, the criteria used by ZWN in their membership approval process for full members is:

> Community based not-for-profit and co-operative groups actively involved in reduction, reuse and recycling projects. These organisations are either incorporated as one of the following: Company Limited by guarantee, Incorporated Society, Trust or Constituted (with a not for profit/charitable status clause) (ZWN, 2018b).

The membership of ZWN includes small, mostly voluntary groups, whose main activity is advocating locally for increased resource recovery and community involvement in waste management. Russell Recyclers are an example of such a group - their activities are largely voluntary and they have a small council contract managing their community's public place recycling bins (Russell Recyclers, 2018). Members also include medium-sized enterprises such as Xtreme Zero Waste who are responsible for the full spectrum of waste management activities in Raglan, achieving a 75% diversion rate and serving close to 30,000 people on their site each year (Xtreme Zero Waste, 2020).

Other ZWN members are focused on education. For example, Para Kore is an independent Māori organisation that integrates mātauranga Māori and para kore principles and practice in its work. It offers support to marae, kōhanga reo (early childhood centres), kura kaupapa Māori (schools) and community organisations to reduce waste.

Although ZWN membership provides a practical way to establish a boundary for who took part in this research, there are many organisations who are active within the community waste sector that are not ZWN members. For example, a large number of plastic-free advocacy groups operate around the country undertaking actions to encourage

their local communities to reduce plastic use. One of these groups, the Palmy Plastic Pollution Challenge, is a citizen science project that aims to gather and present data about locations, and impacts of plastic pollution degrading the mauri of the Manawatū river (Environment Network Manawatū Inc., 2020). Several larger, multi-site ventures such as the Red Cross and the Salvation Army are involved in reuse activities via the operation of their opportunity shops, but are also involved in a wide range of non-waste activities in pursuit of their organisations' mission, and may not define themselves as CREs. The results of this research may have relevance to these kinds of groups, despite the focus on ZWN members.

2.3.2 Characteristics of the network

In the 2019 ZWN full members:

- Recovered 30,000t tonnes of materials through recycling and reuse
- Employed 707 people (460 Full time equivalents)
- Had a combined annual turnover of $30m
- Provided volunteering opportunities for 1510 people (ZWN, 2020c)

ZWN members are involved in a wide range of waste related activities, including:

- Appliance & furniture repair and refurbishment
- Business collections
- Composting programmes
- Drop-off sites management
- e-waste recycling
- Kerbside recycling and waste collections
- Landfill operation
- Operating reuse shops
- Running transfer stations
- Rural waste collection
- Scrap metal yard operation
- Support services/mentoring for new enterprises
- Timber yard operation
- Waste audits and consultancy
- Waste education
- Zero waste event management

Common sources of income for ZWN member include:

- Product sales, direct or wholesale (e.g. reuse shop sales, sales of bales of recyclable materials).
- Provision of services paid for by the end-user (e.g. business recycling collections, workshop fees).
- Provision of services paid under contract (e.g. council recycling collection contracts).
- Grants and donations.

2.4 Impact

Impact is an important concept within this research and its relevance to CREs and the wider non-profit sector will be explored further in subsequent chapters. For now, it is useful to understand the concept broadly. With etymological roots in the latin *imingere* "to push into, drive into, strike against," (Merriam-Webster, 2020), modern usage generally relates to the act of making an impression and/or effect. For example, the Merriam Webster dictionary defines impact as “the force of impression of one thing on another; a significant or major effect” (ibid, 2020).

The first part of this definition relates to visibility; being noticed and/or standing out. The second part relates to the effect something has; how influential something is, or; the change something causes.

This concern with change is a key aspect of the CRE model. CREs seek to change communities' relationship with resources via an impact model that prioritises community-led zero waste activities (McNeill, Barraket and Elmes, 2017, p.5; Allen, 2018, p.1). Another key aspect is the community enterprise (also known as social enterprise) business model, in which CREs “trade to fulfil their mission; derive a substantial portion of their income from trade; and reinvest the majority of their profit/surplus in the fulfilment of their mission” (Barraket, Collyer, O’Connor and Anderson, 2010, p.16). This differs from a traditional business, where profit may go to shareholders. It also differs from a traditional charity model in not relying entirely on donations and volunteers to operate. Table 2.2 presents more detail about these two key features of CREs.

Table 2.1: Key features of the community resource recovery enterprise model

Impact Model	Business model
● Mission driven - established to create a benefit or solve a problem. ● Passionate commitment to the zero waste kaupapa ● Community-led and community-centred. Often, but not always, the community concerned is a geographic one. ● Community development focused - common aims include the provision of meaningful employment, leadership development, and local economic development	● Community owned ● Income derived from sale of goods & services ● Can receive grants and donations ● Mission lock in place - profit is reinvested back into achieving the organisational mission ● Governance and workforce includes volunteer roles

The statement below is an excerpt from a ZWN report on opportunities for waste reduction on Aotea Great Barrier Island and offers an insight into how ZWN discusses impact.

> Community-led resource recovery operations have proven successful in generating a positive social and environmental impact across New Zealand.
>
> Community Recycling Centres are proven to be great generators of local employment. For example, prior to being redeveloped into a community recycling centre, the Waiuku Transfer Station employed one person, three days per week (0.6fte). The community enterprise now operating the site on behalf of Council now has 10 staff and are open five days per week.
>
> Employment is valuable for the economic development of a community, with some economists suggesting a multiplier effect of three times the wages paid. For example, for every dollar paid to a local worker, there is three dollars value for that community in local spend.
>
> Access to materials adds to community resilience. The Kaikoura Earthquakes demonstrated this point with the community recycling centre distributing warm clothing and blankets to evacuated residents and tourists within an hour and a half of the earthquake, despite it being 2am in the morning.

> The environmental impacts of a community-led resource recovery operation are generally measured in terms of diversion of waste from landfill. Continuing with the above examples, Waiuku diverts 65% of the material it receives, and Innovative Waste Kaikoura has reached 77% for its community in the past. (ZWN, 2018c, p.7)

2.4.1 ZWN Impact project

Since late 2017, ZWN has undertaken a range of activities that are relevant to the development of a shared impact framework, including:

- 2017: Theory of Change workshop held at the ZWN annual hui
- 2018: Research report on international approaches to impact as part of the Advanced Zero Waste paper at Massey University.
- 2018: ZWN Board agreed to formalise the impact project
- 2019: Exploring Impact Measurement workshop held
- 2019: Dashboard developed based on ZWN's internal activities

Each of these activities, and their relationship to this research are summarised below.

2.4.1.1 Theory of change workshop

In 2017 a Theory of Change workshop was delivered at the annual gathering of ZWN members, the Strengthening Communities Hui. The Theory of Change process involves the identification and articulation of long term goals, as well a description of the interventions required to bring about the desired outcomes (Taplin & Clark, 2012, p.1)

This workshop offered some useful insight into the long-term goals of network members. The following thematic groupings of long-term goals were identified:

- Increased diversion from landfill, and achieving zero waste
- Community engagement
- Creating meaningful, inclusive employment
- Financial sustainability for our organisation
- Local economic development
- Effective education and behaviour change work

- Development of a zero waste identity (ZWN, 2017, pg. 2).

These were used as a basis for the question relating to organisational goals in the survey of ZWN members in the current research.

2.4.1.2 Research report on international approaches

In 2017 I completed a paper as part of my Master's studies called Advanced Zero Waste. During this I completed a research project focused on identifying the commonalities between how similar projects had been developed and implemented overseas. This was reported back to ZWN members in a number of forums, and their feedback integrated into a series of recommendations. This was then presented to the ZWN Board of Trustees who agreed to formalise the project and allocated a small project budget with the aim of building ZWN member engagement with the project. Four broad thematic areas of impact were recommended, and have been brought into the current research as a way of structuring the survey and focus groups.

1. Economic Development Impacts
    a. Employment - including the number of people employed and volunteering, but also information and stories about how these organisations reduce barriers to employment.
    b. Financial - existing information on financial performance, paired with information about the journey towards being self-funding, and how much they contribute to the local economy.
2. Environmental Impacts
    a. Waste diversion
    b. Wider environmental impacts - such as reducing carbon emissions and reducing energy use.
3. Social Impacts
    a. Participation/reach - information about the reach of organisations such as workshop participants.
    b. Behaviour change and the effects of education programmes - information about how
    c. programmes are leading people to act differently and more sustainably.

4. Cultural Impacts
    a. To what extent this work impacts on cultural identity and engagement.
    b. To what extent this work impacts on place-based identity and engagement.

Each of these themes will be explored in the literature review in Chapter 3.

2.4.1.3 Exploring impact measurement workshop

I jointly facilitated a workshop for ZWN members on exploring impact measurement with Kate McKegg and Louise Were in February 2019. Kate and Louise are evaluation practitioners that were engaged by ZWN for the purpose of helping to identify next steps for the project. A number of ZWN members attended this session and identified behaviour change and reuse as key areas for further research.

Recommendations for future action included:

1. Undertake initial conversations with Vend (point of sale software provider) and the four Auckland Community Recycling Centres and possibly Wastebusters Wanaka, to understand the appetite to utilise Vend consistently to gather data to share a shared impact story.
2. Explore other opportunities for utilising shared tools for shared impact with Waiuku and Wanaka in particular exploring outcomes and impact from educational programmes and the nation-wide plastic-free campaign.
3. Prepare a funding proposal to the Working Together More fund (The Todd Foundation) to commence the development of a collective impact framework drawing on the possible initiatives outlined in points 1 and 2 above.
4. Confirm internal capacity for the work outlined and align to a programme of study to support this work.
5. Review the membership survey and method of collection to gather feedback from the membership that would include:
    a. rating or ranking ideas about domains and well-beings to feed into development of the impact measurement framework,
    b. appetite for contributing to impact measurement,
    c. verifying what current data is being collecting data, and

    d. appetite to utilise common tools.
6. Host a forum during the October Network hui in Kaitaia to present back on the work undertaken and test thinking about the impact measurement framework (Were, 2019, p.1).

These have guided ZWN staff and member activity throughout 2019, with a number of them (for example points 5 & 6) being specifically addressed by this research.

2.5 Conclusion

This chapter has provided context for the research by introducing the concepts of zero waste and impact, describing the wider sector in which the Zero Waste Network operates, and the specific place it occupies within it. This research is the latest piece in an ongoing process to understand the opportunity for shared pact reporting for CREs in Aotearoa New Zealand. As such, this chapter also detailed the previous work that has been undertaken by the ZWN. Building on the information presented in this chapter, the next chapter will engage with the relevant literature on the topic of impact. It defines some key terms and discusses the origins, drivers and criticisms of the impact-focused approach. It then details four aspects of impact, and outlines the types of approaches that have been used to explore these by researchers and practitioners.

Chapter 3. Literature Review

3.1 Introduction

This chapter reviews the literature relevant to impact reporting and measurement and the Community Resource Recovery Enterprise (CRE) sector. It aims to explore the key themes of the research, and specifically, to contribute to answering the first research question: What methodologies and tools exist for gathering data on impact in the community resource recovery enterprise sector? The academic literature lags behind practice in providing theoretical and analytical insights to this field (Ebrahim & Rangan, 2014 p.6). As such, this literature review draws upon a wide range of grey literature from within the CRE sector and the broader non-profit sector, in addition to the academic literature.

It is divided into four main sections. First, Section 3.2 describes the origin of impact as a concept for consideration within the CRE sector. It identifies key terms and outlines the drivers, audiences, and criticisms of an impact focused approach. Next, Section 3.3 introduces four dimensions of impact relevant to CREs that will be explored by this research. These four dimensions are then explored individually, providing examples of tools and methodologies that have been applied by other researchers and practitioners. Section 3.4 then addresses a key issue for the design of a shared impact framework - the balance between qualitative and quantitative data.

3.2 Impact

As discussed in Chapter 2, the concept of impact relates to the causation of change. ZWN members undertake a range of activities in an attempt to achieve change towards zero waste. Zaman (2013, p.683) argues that a zero waste management system requires both an effective implementation strategy, along with a reliable performance measurement mechanism. There is limited academic literature on impact measurement relating to zero waste, however the question of what constitutes appropriate performance measurement mechanisms is a more common theme within the literature on the non-profit sector.

3.2.1 The origins of impact focused models

Several authors trace the focus on impact measurement, accountability and outcomes to the adoption of neoliberal approaches to public policy, including privatisation and competition, in the 1980's and 1990's (Nowland-Foreman, 2015, p.1; Paton, 2003, p.21). The emergence of evaluation as a common feature within both the private and public sectors can be traced back to the industrial efficiency work of Frederick Winslow Taylor in the early 1900's. However, results-oriented approaches only began to be widely adopted in the non-profit sector in the 1990's (Cabaj, 2017, p.2). This was driven by the 'new managerialism' of the sector (Cabaj, 2017, p.2), whereby community and voluntary organisations were increasingly contracted to do services previously provided by the public sector, and expectations around accountability, transparency and contestability also increased (Nowland-Foreman, 2015, p.1; Ebrahim and Rangan, 2014, p.118). Planz, Greenway and Hendricks (1997, p.16) track the evolution of non-profit reporting from an initial focus on financial reporting in the 1960's through to the 1990's where a mix of programme outputs measures, service delivery standards, participant-related measures, key performance indicators and client satisfaction measures were all commonly measured and reported on. Despite this increasing complexity, it was recognised that although these measures provide data on the services being provided, they say little about whether or not it has made a difference, and whether anyone is better off or not as a result of the activity being measured (Planz et al., 1997, p.17). The focus then shifted to *'What, if any, lasting benefits for participants are created as a result of this activity?'*. This is an outcome or results-focused approach which gained traction throughout the early 2000's, with a further evolution towards the language of 'impact' picking up pace after this (Ebrahim and Rangan, 2014, p.118).

Another significant driver for a results-oriented approach came from the philanthropic sector. Nowland-Foreman (2015, p.3) and others suggest that the publishing and distribution of 22,000 copies of the *'Measuring Program Outcomes: A Practical Approach'* manual by US-based philanthropic United Way of America in 1996 was a key point in the adoption of accountability and outcomes focus by the non-profit sector internationally. Ebrahim and Rangan (2014, p.122) discuss the advocacy undertaken by philanthropic organisations for an explicit emphasis on measurement and the development of standardized metrics as an increasingly common feature. As many CREs in Aotearoa New Zealand are recipients of

grant funding, it is an important feature to note, and will be discussed further in Section 3.2.4 below.

3.2.2 Key terminology

This section looks at some of the key concepts associated with a results-oriented approach, and the relationship between them. Several authors identify the need to clarify the terminology used within the impact measurement arena (e.g. UNEP, 2015, p.32; McNeill et al., 2017, p.5; European Commission, 2014, p.28). McNeill et al (2017, p.5) discuss how key terms are sometimes used interchangeably, which can cause confusion among those involved in developing and using frameworks. Three key terms are data, indicators and evaluation which will each be defined below.

Data are unprocessed observations and measurements about the context being researched and related processes, which can then be processed and structured to produce information (UNEP, 2015, p.32). Data are the backbone of impact measurement and this project is concerned with defining what kind of data needs to be collected from ZWN members to make a meaningful statement about the impact of CREs. A United Nations report on data and sustainable development describes the importance of good data: "Data are the lifeblood of decision-making and the raw material for accountability. Without high-quality data providing the right information on the right things at the right time, designing, monitoring and evaluating effective policies becomes almost impossible" (IEAG, 2014, p.4).

Indicators is another important concept. It is often used interchangeably with ***metrics*** and ***measures.*** These terms usually refer to determining output performance in relation to goals (McNeill et al., 2017, p.5). Indicators are used to synthesize and present quantitative or qualitative data in a form that is designed to summarize, simplify and communicate information and to turn that into knowledge (UNEP, 2015, p.32). The accuracy of any impact measurement tool is dependent on a set of reliable indicators that reflect the situation (Zaman, 2013, p.118).

Evaluation is "the systematic determination of the quality, value and importance of something - a project, programme or policy; an initiative, organisation or artefact" (Kegg & King, 2014, p.5). It involves collecting, manipulating, assessing, and presenting data about

the difference the work being done is making, and includes any process that does this – whether it be 'light touch' routine monitoring of outcomes data to 'high level', resource-intensive evaluation (Big Lottery Fund, 2015, p.4). Evaluation can involve both quantitative measurement capturing of qualitative data in the form of stories about how work is done, and the effect it is having.

The literature does not clearly delineate evaluation from impact measurement. What is meant by 'impact' is the main point of difference. Kramer, Parkhurst and Vaidyanathan (2009, p.8) suggest this difference often depends on who is using the term - with funders and non-profits stretching the terms 'evaluation' and 'impact measurement' to include any type of report on the use of funds or the results they achieve. Inspiring Impact, a UK based programme working on impact for charities and social enterprises defines impact measurement broadly as "the set of practices through which an organisation establishes what difference its work makes" (Ní Ógáin, Svistak and de Las Casas, 2013, p.6).

Others define impact measurement as a form of evaluation concerned with long term, even systemic, changes that happen (Goldstein, 2014, p.3). Kramer et al. (2009, p.8) suggest this is particularly true of evaluation professionals. Approaches concerned with longer term and systematic change commonly use a logic framework to describe the pathway from 'inputs' to 'impact'. For example, Ebrahim and Rangan, (2014, p.121) argue that 'outputs', 'outcomes', and 'impacts' are all forms of results but occur at different points. They define 'outputs' as immediate, 'outcomes' as medium and long-term results and 'impacts' as the effects on root causes or a sustained significant change. Their logic framework is shown in Figure 3.1 and this model is then applied to the CRE in Figure 3.2.

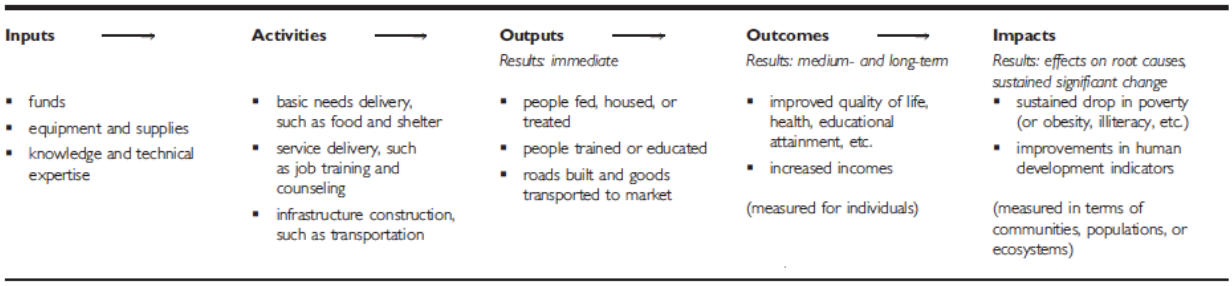


Figure 3.1. Ebrahim and Rangan's Impact measurement logic framework (Ebrahim and Rangan, 2014, p.121).

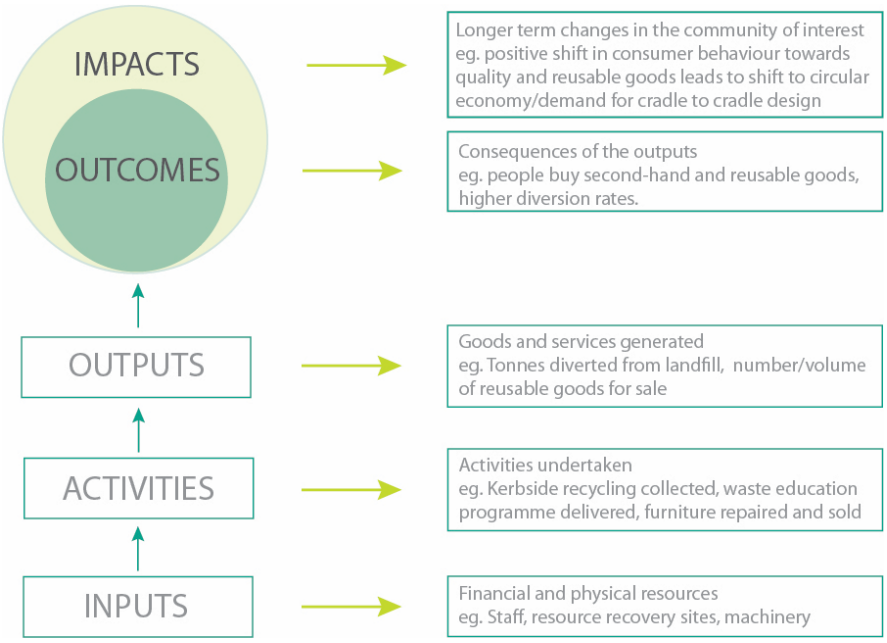


Figure3.2. A logic framework for Community Resource Recovery Enterprises

The logic framework is an important tool for understanding result-orientated approaches to performance measurement. It simplifies complex, real-life situations, providing a logical sense of the relationships between different parts of the journey towards long-term change. The simplicity of the logic model can be considered a weakness too, especially when applied to the real world with all of its ambiguity and complexity. It conceptualises resources, activities and relationships into a collection of abstract lines and boxes, and some practitioners warn of the problems that arise when these are treated as concrete reality (Nowland-Foreman, 2015, p.10). However, as Box and Drapner, in Nowland-Foreman (2015,

p.10) suggest: "all models are false (because at best they are approximations), but some are useful".

The logic model is the basis for the 'theory of change' process which can give an organisation a sense of how it's day-to-day activities relate to the difference it is aiming to achieve. This process is commonly used within the CRE sector in Aotearoa New Zealand, including as a network at the 2017 hui, as discussed in the Chapter 2. Theory of change models have been developed for the key zero waste activities (education, reuse and recycling) undertaken by CREs and are included as Appendix 1.

Nowland-Foreman (2015, p.12) argues that as you move along the logic model from inputs to outcomes and impacts:

- It progressively becomes harder to measure,
- It progressively becomes less clear what is happening,
- You have less control over what happens, and attribution of effects becomes harder
- You need to wait longer to see what actually happens, and
- It is increasingly affected by many more confounding, and often unanticipated external factors.

Ebrahim and Rangan (2014, pg, 132) argue that when defining impact as societal impacts, impact measurement can require a level of research, commitment and resources that are typically beyond the capabilities of operating organizations and that it is not feasible or desirable for all organisation to develop metrics across all parts of the logic chain.

This is an important consideration for the CRE sector where money, and particularly time, are stretched. In their discussion of impact measurement within the CRE sector in New South Wales, McNeill et al (2017, p.5) recognize that there is a significant challenge in determining which methodology will cost-efficiently support effective reporting on performance across multi-faceted missions and diverse information needs without "draining people's enthusiasm for the task". Similarly, Hines et al (2008, p.25) discuss the paradox facing the sector where "to ignore such issues and debates might mean financial and operating suicide, but to spend

substantial time pursuing an understanding of them might lead to interference in the daily operation of organisations, and an imbalance in the focus on market or on mission".

The challenge of resourcing impact measurement offers an argument for a shared approach, and this is explored in the following section.

3.2.3 Shared impact measurement

Shared impact measurement can be defined simply as taking a shared approach to impact measurement: "any tool that can be used by more than one organisation to measure impact" (Ní Ógáin et al., 2013, p.6). It involves a group of organisations working on similar issues - and towards similar goals - reaching a common understanding of what to measure in terms of the outcomes and impact of their work, and developing the systems to do so (Handley, Sabri & Kazimirski, 2016, p.5).

Ní Ógáin et al (2013, p.10) identify a range of benefits associated with shared measurement including that it:

- Saves time and resources by pooling expertise and resources for the development of one tool, rather than many.
- Avoids duplication of efforts to develop measurement and allows multiple funders and grantees to use the same measurement approach.
- Improves standards of impact measurement, by increasing transparency in the methods used and the results generated. Involving several organisations in developing a tool can help ensure that the result is balanced and independent.

Shared approaches to impact measurement have been taken across a number of arenas within the non-profit sector including homelessness, international development, youth work, citizen advice (e.g.. Ní Ógáin et al., 2013; Kramer, Parkhurst and Vaidyanathan, 2009). Shared approaches to CRE reporting are explored in McNeill et al's Community Recycling Enterprises: NSW Impact Measurement (2017) and Allen's Reuse Impact Measurement Pilot Project (2018), which both discuss the topic within an Australian context.

3.2.4 Drivers for an impact focused approach

There are a number of drivers for measuring impact. Three main types of drivers appear commonly in the literature:

1. O**rganisational development & learning**

   These are internal drivers and relate to facilitating understanding about how various programs and activities contribute to achieving objectives and targets, building understanding about what works and what doesn't, and contributing to decisions about what future activities should look like (McNeill et al 2017, p.17; Muir & Bennett, 2014, p.8; Ebrahim and Rangan, 2014, p.122). Monitoring progress through the use of performance indicators provides a good basis for assessing existing situations, carrying out comparisons and tracking changes or progress made over time (UNEP, 2015, p.32).

2. **Evidence of the difference being made**

   As mission-driven organisations, CREs need to align their activities to the reason for their existence. Documenting evidence on the type and extent of work undertaken towards achieving their mission is fundamental (Lakhotia, 2017, p.3). This is important for both internal and external audiences (Muir & Bennett, 2014, p.8)

3. **Accountability and transparency**

   Providing evidence that an organisation acts responsibly and legally demonstrates accountability and transparency to a range of external and internal audiences, and helps to build trust and legitimacy (Muir & Bennett, 2014, p.9). In Aotearoa New Zealand organisations with charitable status (i.e. most CREs) are required to complete an annual return, providing basic financial and service performance reporting to Charity Services, which is within the Department of Internal Affairs. Grant-making organisations often require similar reporting as a part of their funding agreements, and organisations with contracts for service are usually required to provide regular reports on a selection of key measures or key performance indicators. Accountability is considered by some authors as a key mechanism by which charities can achieve legitimacy for themselves, their activities and the sector as a whole (Connolly & Dhanani, 2009, p.5).

3.2.5 Criticisms of an impact focused approach

Several of the main criticisms of focusing on impacts have been mentioned already, from the resource requirements within an already resource-strained sector, to the difficulty of claiming attribution for impacts in regards to complex issues where cause-effect relationships are obscure (Paton, 2003, p.47). Nowland-Foreman (2015, p.21) provides an in-depth discussion on a range of criticisms of outcomes-based models. Some of these criticisms include:

- There are significant technical challenges to doing outcomes-focused measurement well, including the above-mentioned resource requirements, as well as access to effective collection and reporting tools and specialist skills that are needed to do impact reporting well.
- Many outcomes/impacts such as capacity building, community development, policy advocacy and preventative programmes are not easy to pre-determine or quantify.
- There is a lack of evidence that performance measurement improves performance.
- There often is a disconnect between the short timeframes of the reporting requirements and the accurate assessment of long-term impacts.
- Focus on outcomes can have mission-distorting effects, including leading to a misrepresentation of results to focus on the successes and downplay the failures, leading to a reduction in learning opportunities.

This section has introduced the concept of impact measurement as a results-focused approach, including its origins in the development of a managerial approach to non-profit activities. Strong drivers for the approach exist within the CRE sector in Aotearoa New Zealand, despite a number of significant criticisms. Nowland-Foreman (2015, p.24) proposes two key strategies for keeping impact focused approaches relevant:

1. Organisations exploring and developing their own systems that emphasise and support learning and improvement, and
2. Focusing on a particular substantive idea.

This research partially fulfils the first of these recommendations. The second is addressed in the following section, which argues that to understand the impact of CREs in Aotearoa New

Zealand, four dimensions of impact need to be considered: environmental, cultural, social and economic.

3.3 Four dimensions of impact

This section introduces four dimensions relevant to Aotearoa New Zealand's CRE sector. It proposes that these should form the basis of the shared impact framework. It lays out the reasoning for this proposition, identifying the key influences for this decision. It then offers a detailed description of each dimension as they relate to CREs, and identifying and discussing key impact measurement tools.

3.3.1 Influences

As discussed Section 2.3.1.2, research conducted earlier identified three dimensions of impact that have been established as common across the CRE sector internationally: social, economic, and environmental impacts. The inclusion in this research of a fourth dimension (cultural impact), was made in large part due to feedback from the ZWN membership. However, the idea of impact as having a number of different aspects can be found in a number of other relevant spheres:

- The four well-beings. Well-being can be defined as "how people feel and how they function, both on a personal and a social level, and how they evaluate their lives as a whole" (Michaelson, Mahony, & Schifferes, 2012, p.6). Within Aotearoa New Zealand, the concept of greater intergenerational well-being has become a focus of government policy and legislation, for example in The Treasury's Living Standards Framework, and 2019-2020's Well-being Budgets. Social, environmental, cultural and economic aspects of well-being are explicitly identified in several pieces of legislation - namely the Local Government Act 2002 and the Resource Management Act 1991 (Pizzirani et al., 2016, p.664).
- A te ao Māori perspective on well-being. It is recognised that there is a difference between measuring the wellbeing generally and measuring Māori wellbeing through a Māori values approach. A Māori approach to well-being is holistic. Measuring wellbeing through a Māori values approach requires recognition that data can take many forms, often qualitative, and including stories, whakairo (carvings), waiata

(songs) and the knowledge shared in wānanga (learning opportunities) (Independent Māori Statutory Board, 2019, p.7).

- Quadruple bottom line accounting. In 1994, John Elkington, a pioneer in the field of corporate sustainability, introduced the concept of the triple-bottom line (Zalatar & Clark, 2019, p.1). This was a way of expressing value creation in the social and environmental spheres, in addition to the standard financial reporting. The quadruple bottom line builds on this, adding a fourth pillar. In the literature there are different meanings given to this fourth pillar - sometimes it is 'culture' (e.g. Pizzirani, McLaren, Forster, Pohatu, Porou & Warmenhoven, 2016, p.664) and sometimes 'governance' (e.g. Zalatar & Clark, 2019, p.1).
- Within the context of sustainable development. Common definitions of this concept include ecological, social and economic 'pillars' as confirmed at the United Nations Earth Summit held in Johannesburg in 2002. Work to incorporate culture as a fourth explicit aspect or pillar of sustainability pillar has been undertaken by a number of transnational and international organisations like the United Nations; United Cities and Local Government, and the Council of Europe as far back as 2003 (Dessein, Soini, Fairclough, & Horlings, 2015, p.29).

3.3.2 Environmental impacts

Environmental impacts are the effects an action or process has on the environment. Given the zero waste focus of CREs, the environmental aspects discussed in this section are focused on waste related impacts.

3.3.2.1 Waste data and indicators

One of the most obvious places to start when looking at the impact of waste, is with data on the amount and types of waste being created and/or diverted. However, there is no national or international system of definitions, data gathering or reporting protocols relating to waste (WasteMINZ, 2015 p.3). Waste data is lacking for many countries, and where it is available, data quality is variable, and interannual variability is often not well quantified (IPCC, 2007, p.591).

Many countries have systems for the voluntary reporting of waste data, but few have made this reporting mandatory (WasteMINZ, 2015, p.3; IPCC, 2007, p.33). Traditionally, this reporting has focused on diversion from landfill, although recent reports discuss that fuller

accounting of environmental impact is likely to be increasingly implemented, including accounting for things like energy consumption and greenhouse gas emissions/savings (Staub, 2017).

Academic and practitioner efforts are increasingly being put into developing integrated and comprehensive methodologies for looking at resource use broadly, with waste as one part of the resource lifecycle. Life-Cycle Assessment (LCA) is a well-established approach to quantifying environmental, social and economic impacts through the entire lifecycle of a single product (UNEP, 2015, p.30), and is the methodology employed in a number of the waste indicators referenced in the literature. Research by Zaman (2013, p.689) identified 56 key assessment indicators that can be applied in the measurement of progress on zero waste management. These included indicators such as diversion rates and types of waste collected, but also others such as environmental emissions. Other indicators related to consumption habits such as a house's purchasing capacity (Zaman, 2013, p.685). Zaman and Swapan (2016) analysed the zero waste management performance of 168 countries using a zero waste tool. This tool measures the offset of virgin materials that comes from different waste management systems (2016, p.33) and presents the environmental and economic benefits in terms of water and greenhouse gas savings. Material flow analysis and circularity indicators exist and are being used to indicate circularity in some regions and nations (Saidani, Yannou, Leroy and Cluzel, 2016 p.4).

Locally, while much of the waste sector recognises that data collection and analysis is crucial for informing and influencing policy, it is also acknowledged that there are large gaps in how this is done and that this "hampers our ability to plan appropriate activities to improve waste management and minimisation" (Ministry for the Environment, 2010, p.3). The single mandatory requirement that exists for the collection and reporting of waste data is the Waste Management Act's requirement under section 51 for territorial authorities to produce waste assessments as part of the waste management and minimisation plan review process (Eunomia, 2015, p.2).

The National Waste Data Framework project was funded by the Ministry for the Environment with the aim of establishing a staged approach to data collection that could be rolled out across the country. This project, largely driven by councils with a focus on

agreeing on a methodology for measuring and reporting quantitative waste data, is concerned with solid waste only. It does not cover recyclable or reusable materials, which are a significant focus for ZWN members. The broad characteristics included in the National Waste Data Framework (Eunomia, 2015, p.11) are:

- Quantity
- Composition
- Activity Source
- Geographic Source
- Destination
- Time periods

Although there are calls to make this framework mandatory, so far it has not been widely implemented (WasteMINZ Territorial Authority Forum, 2018).

At the end of 2019, the Ministry for the Environment conducted a consultation on New Zealand's Waste Levy. This included two questions about waste data, with the aim of understanding the desire for improved waste data and the implications of cost and compliance requirements. It proposed regulations under section 86 of the Waste Minimisation Act 2008 to:

- Create a record of landfills, cleanfills and transfer stations
- Collect waste quantity data from landfills, cleanfills and transfer stations
- Collect information from landfills, cleanfills and transfer stations about the activities that create waste and the sources of this waste
- Collect information from territorial authorities about their spending of levy money and their performance in achieving waste minimisation outcomes (MfE, 2020, p.37).

In July 2020, as part of the announcement relating to the waste levy increasing from $10/tonne to $60/tonne, the Associate Minister for the Environment, Eugenie Sage, announced that the Government has decided to "collect better data about the waste we are creating, and how we are disposing of it, so ensuring our waste can be better managed" (Sage, 2020). This would affect any ZWN members working with solid waste and, once the

parameters have been defined, it may be prudent to incorporate these into the shared approach.

3.3.2.2 Measuring diversion

Diverting waste from landfill is a key goal of ZWN members. Measuring diversion, especially in the context of shared reporting, requires standard definitions and methodologies for measurement (UNEP, 2015, p.32). Waste diversion via recycling is traditionally measured in weight of materials, such as tonnes of metal, food or plastics. A benefit of measuring weight is the ability to estimate the associated environmental impacts (Fortuna & Castaldi, 2018, p.1191). McNeill et al (2017 p.23) discuss the standardisation of material data in the context of Australian CREs and suggest that adopting a standard weighing system should be the first step. However, adding a layer of complexity to this, reuse entities often measure the flow of products, such as clothes, furniture and books, rather than materials (Fortuna & Castaldi, 2018, p.1191), so agreeing on what material or product categories are to be measured is also key to consistent reporting (McNeill et al., 2017 p.23). The Zero Waste Network Sydney explored using material composition estimates in their shared impact research (Allen, 2018, p.3). These are listed below in Table 3.1. Similarly, Fortuna & Castaldi (2016, p.15) developed a comprehensive methodology for classifying a range of reuse products based on those found in selected reuse organisations in New York, into a maximum of three constituent materials. This methodology also includes a methodology for conversion of data between weight, type and quantity (Fortuna & Castaldi, 2016, p.15).

Table 3.1 Average material composition of common waste types (Allen, 2018, p.3).

Waste type	**Average material composition**
Soft furnishings	15% Foam/ Rubber, 5% Textile, 80% Wood.
General whitegoods	50% Metal, 50% Plastic
Bric-a-brac /Generic/ Uncategorised	10% Brick/Concrete, 10% Ceramic/ Pottery, 10% Foam/Rubber, 10% Glass, 10% Metal, 10% Paper, 10% Plastic, 10% Textile, 20% Wood.
E-waste	12% Glass, 65% Metal, and 23% Plastic.

3.3.2.3 Reuse metrics

While reuse differs greatly from recycling, it is often approached as a sub-sector of recycling when it comes to attributing impacts rather than a discrete waste management pathway (Allen, 2018, p.15). The Waste Resources Action Programme (WRAP) in the UK suggest the lack of attention given to studying the specific and relative merits of reuse can be explained by the complex nature of reuse activities and consumer behaviours, including the complexity of assessing products rather than materials, uncertainty over what is being replaced and for how long, and identifying the waste impacts that are being avoided (WRAP, 2011, p.1). Despite the challenges, a number methodologies for accounting for the impact of reuse activities have been developed, usually as part of the operations of individual CREs or peak bodies, similar to ZWN.

WRAP developed a methodology for quantifying the impacts of reusing products. It is based on life-cycle assessment and cost-benefit analysis processes, and was successfully tested on a small range of products - eight different product types across four categories: electrical, clothing and domestic furniture categories (WRAP, 2011, p.7). The excel-based tool provides a means of assessing the impacts of different waste disposal activities, by comparing reuse, landfilling and incineration, and calculates three environmental indicators (greenhouse gas emissions, energy demand and resource depletion), and two economic indicators (number of jobs and cost impacts) (WRAP, 2011, p.10). The methodology provides important insights to the creation of reuse metrics for ZWN, particularly around the development of a system to define the boundary of assessment in terms of what should be included and excluded in reuse impact measurement. - as illustrated by Figure 3.3 below.

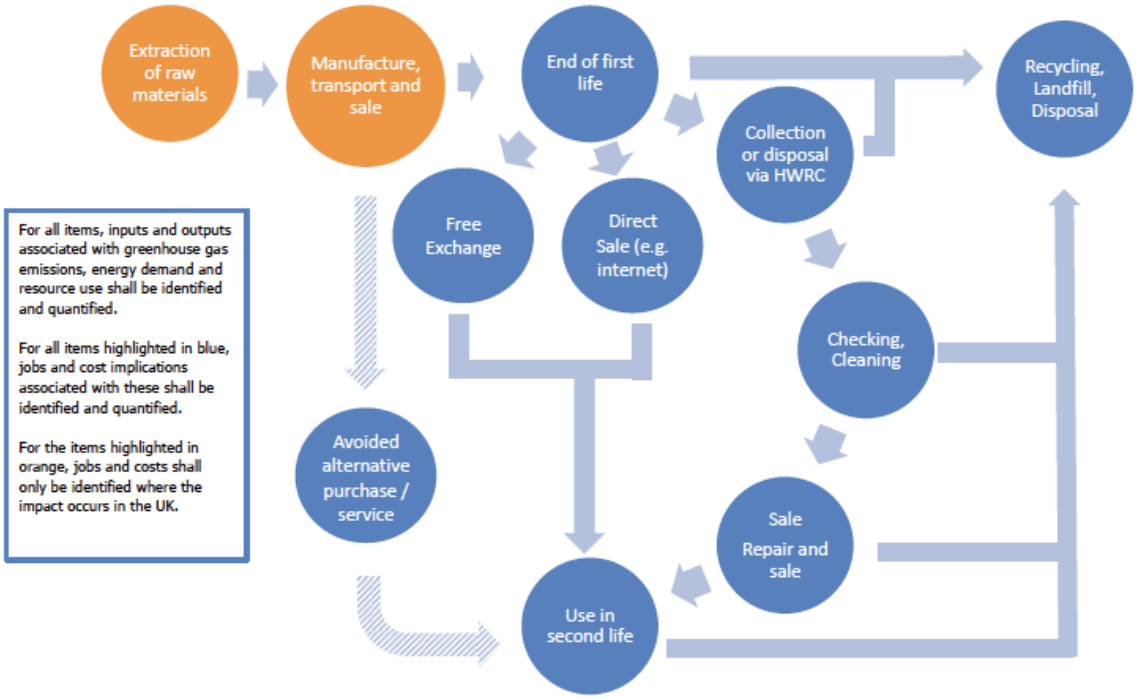


Figure 3.3: Wrap UK's System Boundary for Assessment for the Impact of Reuse (WRAP, 2011, p.11)

The UK's Reuse Network has developed a system for measuring the impacts of their members' reuse activities. This has two parts: automatic collection of point of sales data and a Product Weight Protocol tool. The Product Weight Protocol tool lists the standardised weights of 200 items (Reuse Network, 2018). Members contribute weight data regularly to ensure the tool remains current. Using the weight data as a baseline, they have been able to develop measures for carbon and poverty reduction.

Zero Waste Network Sydney completed a pilot project to design and trial methodologies for collecting and communicating the impact of community-run reuse, repair and recycling activity in the Sydney region. The project engaged four ZWN Australia members to measure goods being processed over a 6-week period with the objective of developing a process for accurately recording and accounting for the waste diversion activities of ZWN Sydney members. Data was used to project annual and geographic diversion figures. The project team also used tools and conversion factors developed externally to calculate energy conservation, greenhouse gas emissions, and employment intensity impacts (Allen, 2018, p.10-13).

In the United States, the City of New York Department of Sanitation has developed the Reuse Impact Calculator, which automates and quantifies the environmental impact of product reuse by non-profit enterprises in New York City (Fortuna & Castaldi, 2018, p.1190). The calculator classifies reused products according to a universal product classification system and also according to the participating organisation's own classification system. It calculates the total weight of materials diverted; estimates the material composition of diverted products; and estimates CO2 emissions and energy savings from the diversion of materials (Fortuna & Castaldi, 2018, p.1192).

3.3.2.4 Carbon accounting

Rising levels of greenhouse gases (GHG) in the Earth's atmosphere are causing climate change. Between 1990 and 2015, New Zealand's net carbon emissions rose by 64% (LGNZ, 2018, p.1). Some of these emissions are a consequence of solid waste. GHG emissions occur at all parts of a product's lifecycle - from the extraction of raw materials to the manufacture, distribution and use of products, and the management of the resulting waste. Figure 3.4 illustrates the relationship between a material's life cycle, disposal options and GHG emissions. The left side of the figure shows the journey of resources from extraction, through processing and manufacturing to disposal, while the right side illustrates the kinds of GHG effects that occur at different points along the lifecycle.

Carbon accounting is a process of measuring the direct and indirect emissions of carbon dioxide and other GHG from a process or entity. Current accounting methodologies attribute only 3-5% of overall GHG emissions to the waste sector, with these emissions coming primarily from methane from landfills (IPCC, 2007, p.587). However, it has been estimated that a 10-15% reduction in global GHG emissions could be achieved through improved solid waste management practices such as recycling and diverting organic materials from landfill. Displacing the production of new products by using second-hand products or reducing the GHG potential embedded in raw materials and products through waste prevention activities could further increase this to 15-20% (United Nations Environment Programme, 2015, p.215, Turner, Williams & Kemp, 2015, p.186).

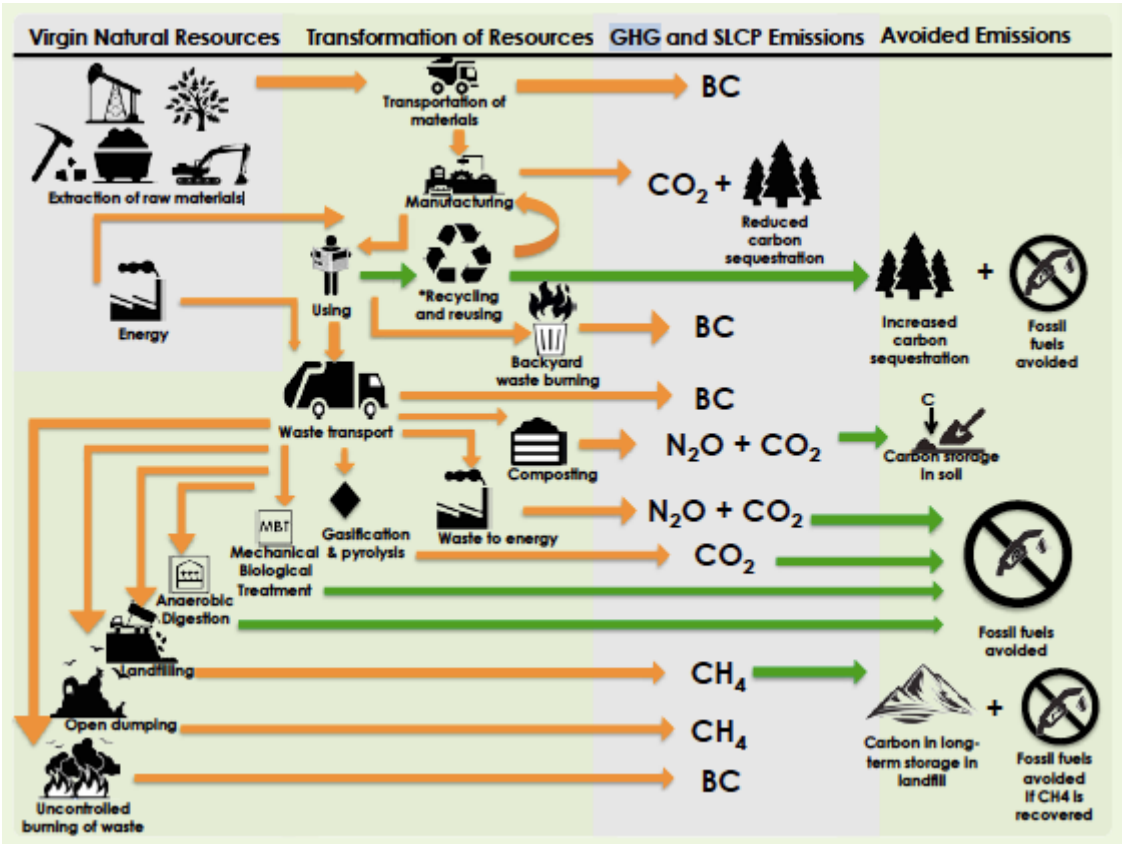


Figure 3.4 Simplified schematic of waste management and climate change (excluding prevention) (UNEP: 2012, p.13).

According to Zero Waste Scotland, there are two common approaches to carbon accounting:

1. The territorial based approach includes emissions released from within a national boundary – the greenhouse gases are attributed to the direct producers of the impacts.
2. The consumption based approach attributes all the emissions of a product to the consumer, regardless of where those emissions have occurred (Zero Waste Scotland, 2013, p.3)

There are a number of existing calculators and/or conversion tables available to aid the conversion of waste data to GHG emission data. Some of these (e.g. the Waste Reduction Model developed by the United States Environmental Protection Agency, Zero Waste Scotland's Carbon Metric and the New South Wales Environment Programme's Recyclator tool) require input data to be in the form of material type (e.g. glass, plastic, wood), and often allow you to calculate GHG emissions for baseline and alternative waste management

practices (such as landfilling, incineration or recycling). In Aotearoa New Zealand, the Ministry for the Environment provides a guide for organisations wanting to voluntarily monitor and report GHG emissions. This includes an interactive workbook, with a section dedicated to waste. Weight data across 10 categories of waste can be inputted into the workbook, and a carbon dioxide equivalent footprint is calculated. It is important to note that plastic is not included in the 10 waste categories (MfE, 2019), which represents a significant gap from the perspective of ZWN members .

Other tools, specific to reuse impact, require the input data to be in the form of the type of object being reused. A Spanish organisation, the Asociación Española de Recuperadores de Economía Social y Solidaria (2020), has developed an online CO2 calculator for 39 object types over four categories, while the Reuse Network UK's (2020) calculator includes CO2 emissions impacts for six different product types.

3.3.3 Cultural impacts

Culture can be defined as "the whole complex of distinctive spiritual, material, intellectual and emotional features that characterize a society or social group.It includes not only arts and letters, but also modes of life, the fundamental rights of the human being, value systems, traditions and beliefs" (UNESCO, 1982). It is the knowledge, practices, values, ideas, language and worldviews within a social group, and is not bound to a given geographical location or fixed in time (Pizzirani et al., 2014, p.1316). A person's cultural identity comes from the various features of someone's background and social situation that shape and define who they are (Gilbert, 2010, p.2).

As the definition of culture above expresses, culture is multi-dimensional. It is linked to the environment through connections between ecosystems and peoples' sense of identity, place, worldviews and well-being (Pizzirani, McLaren & Seadon, 2014, p.1316). Zero waste, as an environmental issue, has a cultural dimension in that it is human knowledge, practices, values and ideas that lie behind the human activity of waste creation, and even in the perception of a material as waste, or as a resource. Solutions to environmental problems, such as waste, are also likely to be culturally-based (Dessein, Soini, Fairclough, & Horlings, 2015, p.14).

Although closely interrelated, social and cultural dimensions are increasingly seen as distinguishable from one another (Pizzirani et al., 2014, p.1324). In Aotearoa, government policy officially recognises 'culture' as a distinct concept. For example, the Resource Management Act (1991) and the Local Government Act (2002) both promote the advancement of social and cultural well-being in local communities (Pizzirani et al., 2016, p.664). The distinction is associated with an effort to counteract the historical absence of Māori perspectives in decision making, law and policy due to historical experience of colonisation, dispossession and discrimination (Pizzirani et al., 2016, p.664; Iorns Magallanes, 2015, p.283). Culture is increasingly recognised within the context of policy, however it remains largely unrecognised in assessment techniques (Pizzirani et al., 2014, p.1316).

There are two ways that culture interacts with CRE impact that have been explored in the literature: place-based aspects of culture, and; the concept of organisational culture.

3.3.3.1 Place-based aspects of culture

As we attach subjective cultural meanings to place, these meanings can be linked to the construction of identity, and are often described as a *'sense of place*' (Dessein et al., 2015, p.40). The majority of CREs work at the level of a single, local community, so how these organisations interact with and affect the culture of the local community and their geographic position is one aspect to investigate in this research. Several pieces of research found that CREs interact with other community groups within their communities. Yousefpour et al (2012, p.31) identified both the reinvestment in other community-based activities and organisations and the building social capital between people from different backgrounds as cultural impacts of the Australian CREs studied. Research undertaken by consultancy Brooke Lyndhurst (2007, p.36) in the UK, found that CREs also engage with their communities by working with established community services and community groups. Of the 52 organisations working with intermediaries:

- 66% worked with schools
- 44% worked with faith groups
- 44% worked with older people
- 33% worked with services for low income households

- 33% worked with youth groups
- 25% worked with maternity services
- 13% worked with sport or leisure clubs
- 33% worked with unspecified other groups (Brooke Lyndhurst, 2007, p.36).

Taking a broader perspective on the idea of place, at the level of the nation state there are considerable aspects of culture specific to Aotearoa New Zealand that intersect with the work of CREs and could be investigated as part of an impact framework. Considering te ao Māori and how it influences the culture of CREs is the chosen focus here, however it is acknowledged that there are many other relevant topics. For example, the different ways we as New Zealanders collectively understand what 'environment' means, or the concept of a 'clean, green New Zealand' and the implications of the 100% Pure New Zealand marketing campaign could all provide valuable material for an exploration of culture as it relates to zero waste.

The relationship between CREs and the Te tiriti o Waitangi/the Treaty of Waitangi is the chosen starting point. The reason for this focus stems from the action research approach taken in this research - it is a response to ZWN member feedback about what they wanted the shared impact framework to include.

Te tiriti o Waitangi forms the basis of both British settlement of Aotearoa New Zealand and the recognition of the unique and special place of Māori as tangata whenua (Iorns Magallanes, 2015, 284). It puts significant weight on partnership, active protection of Māori interests and redress to address past wrongs, collectively conveying an obligation on the Crown and Māori to work together (Te Puni Kōkiri and the Treasury, 2019, p.i).

In exploring partnership it is important to note that the large majority (with one exception) of ZWN members are not Māori organisations, in that they have not been established under hapū authority. Instead, they have been established under the authority of the New Zealand government, and their rights and responsibilities are linked to those of the Crown, rather than tangata whenua (Treaty Resource Centre, 2016, pg.4). This relationship is illustrated in Figure 3.5 below. Honouring Te tiriti o Waitangi places a responsibility on ZWN and its

members to protect things that are a taonga to Māori and to develop meaningful partnerships with Māori (Gordon-Burns & Campbell, 2014 p.25).

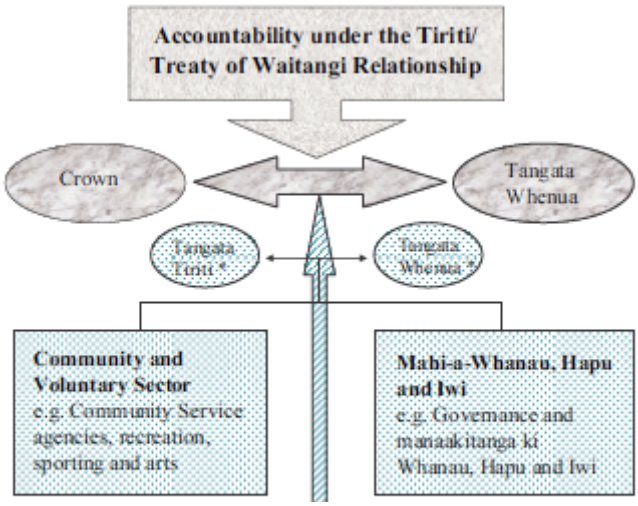


Figure 3.5: Accountability under Te Tiriti o Waitangi
(Community Sector Taskforce, 2006, p.5).

There are a number of models designed to assess cultural values and perspectives. Some of these have been developed in Aotearoa New Zealand. These are based on a blend of mātauranga Māori, traditional concepts, and Western scientific knowledge and are being increasingly used to provide cultural perspectives, in planning, policy and decision-making, particularly in respect to resource management (Harmsworth & Awatere, 2013, p.274).

One of these is the mauri model developed by Te Kipa Kepa Brian Morgan. The mauri model is a decision-support tool, rather than an impact measurement tool. Despite this characterisation, there are some useful aspects to the model that are worth considering in relation to CRE impact.

The mauri model is based on measuring the effect on the mauri (life-force) of a particular thing or place to assess the viability and sustainability of a proposed activity (Morgan, 2004, p.6). Mauri was chosen as the conceptual basis for the tool, due to its importance in making existence possible - weakening the mauri of something weakens the bonds between physical and spiritual elements. The separation of these elements can result in the death of a living thing or alternatively the loss of a thing's capacity to support other life (Morgan, 2006, p.3). Four interactive aspects of our ecosystem - family/whanau (economic), the community

(social), the clan/hapu (cultural), and the ecosystem/taiao (environment) are scored for importance by decision-makers and stakeholders. A predetermined weighting of each of the four parts is then applied to each score. This weighting is determined by the participants and adjusted depending on the relative importance of the four well-being dimensions of various stakeholder groups, although the default Morgan proposes is the mauri of the ecosystem have the strongest weighting, before the hāpu, the community, and then finally the whanau dimension, (Morgan, 2006, p.4). The final calculation gives a final score resulting in an overall sustainability rating, illustrated by a five part barometer (see Figure 3.6) from destroyed mauri to enhanced mauri (Morgan, 2006, p.5).

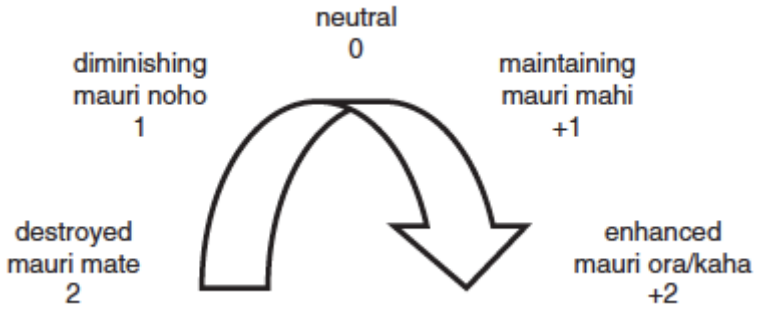


Figure 3.6: Morgan's sustainability barometer for mauri (*Morgan, 2006, p.6)*

The mauri model illustrates that it is possible to incorporate cultural, environmental, economic, and social aspects into a single model, as well as providing an example of how ngā ao Māori (Māori worldviews) can be incorporated into the design of assessment tools.

3.3.3.3 Organisational culture

Organisational culture is a widely studied topic. Two aspects of particular interest for this research. These are: How valuing 'zero waste' influences organisational culture, and; the relationship between culture and identity formation.

Organisational culture refers to the shared values and practices that evolve within an organisation (Lewis, 2002, p.68). It recognises organisations as being formed of, by and for groups of people. Most authors consider that there are at least two levels of organisational culture: visible aspects such as behaviour patterns, the physical and social environment and the written and spoken language (including mission statements) used by the group, and

deeper, less visible aspects such as values and norms (Wilson, 2001, p.356; Abson et al., 2017, p.34.). Another distinction is made between formal structures - systems and organisational practices - and informal ones, such as unspoken assumptions, norms and behaviours (Pucetaite, Novelskaite, Lamsa and Riivari, 2016, p.687). There can be multiple cultures or subcultures within an organisation, usually associated with different functional or geographic groupings (Wilson, 2001, p.355).

Values are concepts and constructs that capture and express what is important to us, and are expressed in our decision-making, actions and communications (Henderson, Thompson, & Henderson, 2006 p.19). As discussed in Chapter 2, zero waste has practical aspects as an approach to waste management, but also sits in the conceptual realm as a goal and design philosophy. In this sense, zero waste is likely to be a core value within many CREs. The extent to which this is true could be explored through an analysis of goal or mission statements (Henderson, Thompson, & Henderson, 2006 p.21).

Such an analysis would, however, only serve to increase understanding about the explicit aspects of organisational culture. To understand the less formal aspects it is useful to consider organisational identity - how an organisation defines itself. Within the literature there are two common ways of understanding how organisational identity is developed. The Social Actor perspective is based in institutional theory and posits that organisational identity is proposed by organisational leaders and actors within an organisation come to understand the organisational identity by learning about these institutional claims (Whetten & Mackey, 2002, p.396). The other common perspective is a Social Constructionist perspective whereby shared understandings of identity are developed by the members of the organisation collectively (Ravasi & Schultz, 2006 p.434). Ravasi & Schultz (2006 p.436) discuss these perspectives as being complementary, with *sensegiving* processes coming from formal organisational narratives, and *sensemaking* processes occurring as members interpret these. Examining how individuals within an organisation make sense of organisational identity would give insight into the informal aspects of cultural identity. Observation and interviews are common methodologies employed when studying these aspects of organisational culture (Ravasi & Schultz, 2006 p.438).

3.3.4 Social impacts

CREs are recognised as generators of positive social and socio-economic impacts (McNeill et al., 2017 p.27). Social benefits created by CREs recognised within the literature include employment; provision of training and employment to job seekers and those with barriers to work; education on resource use and sustainability, and; improving social inclusion (Yousefpour et al., 2012, p.31). This section presents an inquiry into the relationship between the CRE model and employment, volunteerism, behaviour change, outcomes for service users and access to affordable goods.

3.3.4.1 Employment intensity

Employment benefits of the zero waste model are significant due to the high labour-intensity of processes for collection, sorting, recycling and reuse, as well as the high priority given to the education function of CREs. Several comparative studies looking at the employment intensity of different waste activities have found that reuse and recycling - priority activities for CREs - create a greater number of jobs than landfilling or incineration. For example, a 2009 study undertaken by Access Economics Pty Limited for the Australian Department of the Environment, Water, Heritage and the Arts found that the estimated number of full time equivalent (FTE) jobs per 10,000 tonnes of waste processed was 9.2 for recycling, versus 2.8 for landfill. Earlier research by the United States' Environmental Protection Agency (2002, p.2) found recycling created 36 jobs per 10,000 tonnes of waste, versus 6 jobs for landfill, and only 1 job for incineration. A 1997 study by the Institute for Local Self Reliance looked in more detail at the job intensity of different parts of the reuse and recycling sector and found the highest employment intensity could be found in computer reuse operations with 297 jobs per 100,000 tonnes, followed by textile reuse at 85 jobs. Yousefpour, Barraket & Furneaux (2012, p.31) found that Australian CREs undertaking both reuse and recycling activities employed 100 people per 10,000 tonnes. More recently, ZWN Sydney has calculated the employment intensity of reuse at 195 FTE roles per 10,000 tonnes of material reused. These results indicate that the employment intensity increases as the activities move up the waste hierarchy from disposal, to recycling and then reuse. A summary of the results of these studies is illustrated in Table 3.2. No such study has been completed in New Zealand.

Table 3.2: Research on employment intensity in the waste sector - summary of results, based on FTEs per 10,000 tonnes of waste processed

Type of operation	Access Economics (2009, Australia)	US EPA (2002, United States)	Institute for Local Self Reliance (1997, United States)	ZWN Sydney (2019, Australia)
Reuse (general)	-	-	-	195
Reuse (computers)	-	-	297	-
Reuse (textiles)	-	-	85	-
Recycling	9.2	36	10	-
Landfilling	2.8	6	1	-
Incineration	-	1	1	-

3.3.4.2 Volunteerism

The number of volunteers across ZWN is more than twice the total number of employees. For this reason alone, it is an important aspect of the CRE model and worth further exploration in regards to impact measurement. Volunteerism generally refers to unpaid work that is done outside of one's household. The International Labour Office (2011, p.13-15) considers that volunteerism generally has a number of features, including that it:

- Involves activities that produce goods and services with value to its recipients i.e. 'work'
- Is unpaid, but can involve monetary or in-kind compensation (e.g. travel costs, gifts of gratitude) may be offered
- Is non-compulsory
- Can be done directly, or can happen through an organisation

Volunteerism within the CRE sector has impacts across all four dimensions:

- Volunteers make a significant economic contribution - Statistics New Zealand (2016) calculates this within Aotearoa New Zealand at $6 billion every year, with the value of volunteers' labour alone contributing $3.5 billion. To explore this within a CRE context could involve establishing the number of hours contributed by volunteers, and multiplying this by an agreed hourly rate.
- The work undertaken by volunteers within a CRE would contribute to the waste diversion outcomes if the volunteers were involved in reduction, reuse or recycling activities. This could be explored via an analysis of where in the organisation roles are filled by volunteers and the application of this data to a waste hierarchy analysis.
- Social and cultural impacts of volunteering can be both at the level of the organisation and within the volunteer themselves. For example, research has found that volunteering builds collective efficacy through the development of a sense of civic duty and altruism; the fostering of positive social norms; spreading information and innovation; and providing a mechanism for collective problem-solving (Pope, 2011, p.14-21). Potential benefits for the volunteer are increased well-being via the building of social connection and capital, and a connection to career paths and labour markets that are better paid and more stable (Australian Bureau of Statistics, 2010, p.3-4)

It is common to explore the value of volunteerism via the use of survey tools. The International Labour Office suggests that to allow for the greatest standardisation and compatibility to other sectors, volunteer surveys should include the following:

- Amount of volunteer time (hours actually worked)
- Type of work activity (occupation)
- Field in which volunteering occurs (industry or economic activity)
- Organizational venue of volunteer work (institutional sector) (The International Labour Office, 2011, p.13-15)

For impact measurement relating to internal decision-making, volunteer satisfaction measures, and data on engagement (e.g. attendance, time spent, number of new versus repeat volunteers, and where the volunteer has come from) can help organisations determine things

like drivers for volunteering and volunteer programme retention and performance (Berger, 2020).

3.3.4.3 Zero waste education and behaviour change

> *"Waste is a social problem. Technical solutions can only take us part of the way. To reach a 70% diversion target, we need 80% of people to recycle 90% of the stuff. Winning hearts and minds is vial. Encouraging and supporting people to change the way they consume is our core business" (ZWN, 2013, p.2).*

This is an excerpt from the ZWN manifesto on the priorities for the network. It illustrates ZWN's position that the goal of zero waste and behaviour change are closely linked. Increasing community awareness and developing people's motivation, skills and/or knowledge to take action and innovate are key to achieving zero waste. These activities can be collectively characterised as zero waste education. Education is defined broadly and includes all programs and services that impart knowledge and skills. Zero waste education has a role in supporting all waste minimisation and management activities. Commonly, zero waste education programmes can be categorised into three types:

1. Public and customer service related communications
2. Awareness building
3. Behaviour change interventions

Table 3.3 presents the key features of these, including their cost to implement, potential for behaviour change, audience, examples and possible measurement techniques.

Table 3.3. Zero Waste Education Categories. (Adapted from Oregon Metro, 2015)

Type of Education Programme	**Public and customer service communications**	**Awareness building**	**Behaviour change Interventions**
Basic features	Information about waste related issues and/or activities. This type of education plays an important support role for the other two types of programmes or are used to reinforce an adopted behavior by providing information on locations, schedules, etc. It also has a role in creating customer recognition and satisfaction in a service.	Campaigns or programs designed to actively seek out audiences to increase awareness of local tools and services, and provide information about waste prevention, reuse and recycling. The purpose here is to educate people on available services, desired behaviors and where to obtain more information.	Programmes of sustained education with the goal of modifying a targeted behaviour of a specific group. These programs use multiple strategies to encourage specific audiences to become knowledgeable about the benefits of a very specific behavior, acquire skills to engage in the new behavior and remove barriers to participation in the behavior.
Cost to implement	Low	Low- Medium	High - these require ongoing contact and support of participants over time
Potential for behaviour change	Low	Low	Medium - High
Audience	General, made available to those who seek it	Specific audiences are considered in the design of the materials and/or activity	Designed and delivered to a specific audience
Examples	Information sheets on composting; Rubbish collection day information; Auckland Council's Make the Most of Waste website; Council customer service hotline	Events, Love Food Hate Waste Campaign; Best and Worst Packaging Awards; Information stalls at events; Community engagement processes such as surveys; Advertising.	Compost Collective workshops; Para Kore programme; Kai Conscious Waiheke programme; Zero waste education in schools
Possible Measurements	Number of info sheets distributed, number of unique calls/web visits	Campaign reach via number of social media shares and likes; number of survey respondents; number of event attendees; Survey results	Level of initial and sustained behaviour change; participant feedback, survey results

Measuring reach and participation rates is common among ZWN members. For example: the Para Kore website includes data on the number of Marae signed up to take part in their programmes, as well as participants at presentations, wananga and events. Similarly, Xtreme Zero Waste counts the number of people who visit their Raglan site, along with the number of children that have interacted with their education programmes. An example of the publicly available version of this data is shown in Figure 3.7 below.

Figure 3.7 Example of reach and participation rate data presented on the Xtreme Zero Waste website (Xtreme Zero Waste, 2020).

In regards to this research, a key question is how much can change in a client's waste behaviour be attributed to the activities undertaken by ZWN members? This question of attribution - the extent to which ZWN members are responsible for the outcome, as opposed to its being due to the intervention of others - makes measuring behaviour change a complicated task.

Understanding how behaviour change works is important for understanding how it may be measured, and the literature on this topic is extensive. There are vast numbers of frameworks for interventions, built around an even larger number of theories and models (Sweeney, 2009, p.5). This section will only provide a brief overview, based on the literature concerned with behaviour change as applied to waste minimisation specifically, or sustainable behaviours more generally.

Changing waste behaviour is most effective when based on a sound theoretical framework that allows for a targeting of the key determinants of behaviour and utilizes persuasive appeals (Cameron, 2002, p.2). Four key areas within the literature are:

1. Models of behaviour
2. Theories of change,
3. Frameworks for change, and
4. Measuring change.

1. Models of behaviour

Social-psychological models are concerned with plotting influencing factors that are situated within an individual's psyche and usually build upon the principle of rationality, taken from economic theory (Darnton, 2008, p.11). This principle states that people tend to act in ways that maximize benefit to themselves, therefore models utilising this principle consider behaviour as a decision-making process. How people act involves people planning ahead and is based on intent and expected outcomes (Darnton, 2008, p.11). In these 'expected utility models', such as Fishbein and Ajzen's Theory of Planned Behaviour (TPB), an individual's attitude – the person's beliefs about the perceived consequences of performing a given action, and a subjective evaluation of each of the consequences – is commonly considered as the crucial factor in determining behaviour. According to this theory, if someone learns about the concept of recycling, thinks it over and decides they think recycling is important, then they are likely to recycle. The traditional focus on attitudes has led to a high proportion of environmental interventions targeting a change in attitude to affect behaviour, but many with little success (Cameron, 2002, p.4).

The existence of an 'attitude-behaviour' gap in which someone saying they are minded to do something does not necessarily mean that they will do it, has been the focus of additional academic research and theories (Brook Lyndhurst, 2007, p.45). For example, Triandis' Theory of Interpersonal Behaviour remains intention based, but includes other influential factors such as the concept of habit, which can bypass attitudes to affect behaviour directly and facilitating conditions that can influence whether intention turns to behaviour or not (Darnton, Elster-Jones, Lucas and Brookes, 2006, p.14). An important facilitating condition is knowledge. In early models it was suggested that environmental knowledge would lead to environmental attitudes, followed by pro-environmental behaviour. Cameron (2002, p.11) argues that the knowledge base must include an understanding of the adverse consequences if

the pro-environmental behaviour is not undertaken, as well as an understanding of how to act, and that one is able to act (agency).

Surveys, resource metering, focus groups and interviews are all methods that have been used to study the relationship between knowledge, attitudes, habits and pro-environmental behaviour (Sweeney, 2009, p.36-50).

2. Theories of change

Theories of change are concerned with how behaviour changes over time. These theories suggest that behaviour change occurs in stages or steps and that movement through these stages is neither unitary nor linear, but rather, cyclical, involving a pattern of adoption, maintenance, relapse, and readoption over time (Sweeney, 2009, p.9; Darnton, 2008, p.15).

Behaviour change does not always follow a linear model of cause and effect. A key theory is Lewin's Change Theory of how group interactions work to change habitual behaviours. This involves an iterative unfreezing/refreezing dynamic in which an individual's habitual behaviours come under the scrutiny of their peer group, are reconfigured, before being incorporated back into everyday routines (Darnton, 2008, p.15).

Another stage-based theory is Rogers 'Diffusion of Innovations' theory. This places importance on the social network in behaviour change and suggests that the processes by which ideas are spread throughout a community or network typically makes use of key individuals who can advocate for and/or model the behaviour (Cameron, 2002. p.3). Interventions that utilise this theory would enlist people who are recognized as individuals with influence over their community and provide them with resources and information which they can disseminate through the network (ibid, p.3).

3. Frameworks for change

These are the practical implementation of theories of behaviour and models of change (Sweeney, 2009, p.10). Both Darnton (2008, p.36) and Sweeney (2009, p.10) have collated the frameworks commonly applied to waste reduction. These include:

- Stearns ABC Model (2000)

- Barr's Path Analysis Models of Reducing Behaviour (2005)
- McKenzie-Mohr's Community Based Social Marketing (2000)
- Andreasen's Six Stage Model of Social Marketing (1995)
- Gardner and Stern's Principles for Intervening to Change Environmentally Destructive Behaviour (1996)
- Bartholomew et al's Intervention Mapping (IM), (1998)
- Defra's 4Es Model (2005)
- Knott et al's Cultural Capital Framework (2008)
- Robinson's Seven Door Model (2001)

CREs use a range of approaches and intervention frameworks used. Doug McKenzie-Mohr and Les Robinson are two key practitioners that have provided training on the application of their frameworks to the waste sector in Aotearoa New Zealand.

4. Measuring change

Evaluation is discussed by many authors as being integral to good intervention design. Darnton (2008, pg. 23) argues that building evaluation into the design of behaviour change interventions effectively closes the loop of the intervention cycle, by feeding learning back into the process. Some frameworks, such as McKenzie-Mohr's Community Based Social Marketing process, include evaluation in the design of interventions (Metro, 2015, p. xii). Such evaluations should measure change in the target behaviour among the group that is the target of the intervention, as well as impacts on the key influencing factors (Darnton, 2008, pg. 33). Sweeney (2009, pg. 1) suggests it is important to ensure that evaluation of outcomes captures other sources of influence on the behaviour change. Cameron (2002, p.28) proposes 14 factors that could be included in evaluations of waste minimisation programmes that cover:

1. Waste minimisation outcomes
2. Behaviour change (both targeted behaviour and related behaviours to assess the flow-on effects)
3. Change in intentions and commitments
4. Change in action plans
5. Change in perceived barriers

6. Change in social norms
7. Change in competence
8. Change in perceptions of behavioural consequences
9. Change in knowledge about targeted waste minimisation behaviour
10. Change in worldviews (sense of stewardship, responsibility for waste)
11. Change in social values
12. Change in endorsement for institutional/structural changes (e.g. willingness to support legislation for waste minimisation policies and programmes)
13. Community cohesion
14. Cost-effectiveness analysis (programme costs, savings, creation of jobs, etc.)

She suggests that both qualitative and quantitative methods can be used in evaluation processes, and that comparisons between groups that are the target of the intervention with groups that are not, as well as comparisons over time are the most appropriate for community-based waste minimisation interventions (e.g. Non-equivalent control group, with pre-test and post-test evaluations and single group, time series evaluations) (Cameron, 2002, p.28).

3.3.4.4 Client/user outcomes

Client outcomes are a common aspect of performance measurement in non-profits (Nowland-Foreman, 2015, p.6). This is related to these organisations often having a client or community-centred missions. In the case of CREs this is likely to be local communities. Customer satisfaction surveys are a common methodology and data collected include staff courtesy, condition of facilities, physical and cultural accessibility, and the timeliness of services (Nowland-Foreman, 2015, p.6). An important aspect of CRE service delivery is contracts with local councils, and these relationships are often measured via key performance indicators.

3.3.4.5 Access to affordable goods

The provision of affordable goods is linked to positive social outcomes such as poverty reduction (Reuse Network, 2017b). The Reuse Network in the UK describes this as how many low income households it helps, and how much they have saved by purchasing secondhand essential items. To calculate this information they collect data on the percentage

of sales turnover from customers using government crisis loans and community care grants (Reuse Network, 2017b, p.5).

3.3.5 Financial and economic development impacts

Financial performance is a way of measuring efficiency and assessing the overall effectiveness of activities conducted by an organisation. However, there is growing recognition that models of performance utilised by the for-profit sector, such as profit margins and return on investment, are not the only, or the most helpful, way to understand the performance of mission-driven organisations (Bagnoli & Megali, 2011, p.150). Most ZWN members are social enterprises, and these organisations externalize benefits and internalize costs more than other economic actors, making them inherently less profitable than their for-profit counterparts (VanSandt, Sud & Marme, 2009, p.421). Ebrahim and Rangan (2010, p.4) argue financial ratios fall short of the reporting needs of such organisations, given that financial performance is often a means rather than an end to social sector activity.

In researching the activities of the Australian CRE sector Yousefpour et al (2012, p.31) highlighted a number of local economic benefits of the CRE model such as employment creation, skills development, niche market development and value adding, and contribution to local supply chains. Information about the journey towards being self-funding via information on the percentage of funding from different sources was common across several pieces of research on the CRE sector (Yousefpour et al., 2012; Williams, Croker & Barrett, 2005).

3.3.5.1 Return on investment

Return on investment is a concept that has long been used by the business sector to monitor performance (Preuss, 2016, p.2). In the for-profit context it is an expression of the benefit divided by the cost of investment, usually from external investors. The term is commonly used within the non-profit world, but with ‘investment’ in the sector traditionally coming in the form of grant and other philanthropic support, it is generally understood as a way to discuss either a) the financial outcomes of a grant or investment, or b) the benefits derived from the grant or investment but not expressed in financial terms (Preuss, 2016, p.9).

Within the broader non-profit sector, Social Return on Investment (SROI) is a common technique for measuring impact and outcomes (Millar & Hall, 2013, p.924), driven in large part by the concerns and preferences of funders (VanSandt, Sud & Marme, 2009, p.424). SROI is an outcomes based framework that measures and accounts for the broad concept of 'value' and incorporates social, environmental and economic impacts. It was developed from social accounting and cost-benefit analysis methodologies that assign monetary values to social and environmental returns to demonstrate wider value creation (Millar & Hall, 2013, p.927). It uses financial proxies to represent the value created to produce a ratio of the benefits to costs known as the SROI value (Lakhotia, 2017, p.4). For example, a ratio of 3:1 indicates that an investment of $1 delivers $3 of social value.

3.3.5.2 Multiplier effects

Another commonly referenced methodology employed to examine economic impacts are multipliers. An economic multiplier aims to describe the impact that an organisation's (or sector's) spending has on the economy, taking into consideration knock-on effects. At its most basic, the measuring process starts with a source of income and follows how it is spent and re-spent within a defined geographic area - usually a region or the nation as a whole (NEF Consulting, 2018). Research has been conducted into multiplier effects associated with the New Zealand CRE sector (Kelk, 2009), as well as a number of other parts of the New Zealand economy such as tourism and transport (Tantirigama & Singh, 2009), and the music industry (PWC, 2018).

There are a number of different approaches to calculating multipliers, differing in the complexity of the analysis undertaken and by how local the geographic region being studied is defined (e.g. regional or national). Two of the examples given above - the studies calculating multipliers for the music industry and tourism and transport sectors - were both concerned with looking at the performance at a national level and used an approach that aims to estimate the total value of the direct and indirect economic impacts of a sector on output (as measured by GDP) (Vernon & George, 2001, p.A2-1). These types of analyses are highly complex, involving numerous equations. Kelk's (2009) analysis takes a different approach, comparing the economic contribution of three different types of recycling enterprises (a CRE, a NZ owned recycling company, and a non-NZ owned recycling company. This analysis found that the CRE generated the largest value added in the local economy, with $0.90 out of

every $1.00 spent on recycling returning to the community, compared to the NZ owned recycler at $0.72 and the non-NZ own recycler at $0.62 (Kelk, 2009, p.5).

3.4 Qualitative versus quantitative tools

Although many impact measurement projects and much of the literature are concerned with quantitative data, qualitative data was identified by McNeill et al (2017, p.31) as something that stakeholders of CREs often specifically look for in reporting.

Quantitative techniques have a number of benefits, especially in the context of shared impact measurement: they can be replicable across sites, produce data that are amenable to statistical analysis, and can be demonstrated within a defined logic framework (Wilder & Walpole, 2008, p.529). However, quantitative indicators often fail to capture some essential aspects of work being undertaken and the value created, or, in their emphasis on the quantitative, can misrepresent, or undervalue the qualitative data that underpins it (European Commission, 2014, p.25). Qualitative research may not be representative in the statistical sense, however its purpose is to achieve a greater depth of understanding of the relevant issues (Brook Lyndhurst, 2007, p.6). Collecting and reporting qualitative data, represents an opportunity to demonstrate value that can be difficult to express in numbers and can be a way of capturing and honouring the uniqueness of individual organisations. It also provides a way to contextualise quantitative data, as well as information on the process of change which, contrary to many program designs, is not a linear cause and effect process but one that can take a long period of time and involve many influences (Sweeney, 2009, p.1).

There are a range of methods and tools focused on collecting qualitative data for use in assessing outcomes and impact, such as outcome mapping, appreciative inquiry and the Critical Stories of Change method (Wilder & Walpole, 2008, p.529). One of ZWN's community network partners, Environment Hubs Aotearoa, recently undertook a research project investigating tools to enable their members to report against the Sustainable Development Goals. The tools developed in this project remain largely qualitative, with a focus on participants interpreting the 17 sustainable development goals for the local setting.

For the shared measurement work being developed in the Australian context, McNeill et al. (2017 p.31) suggest that a story generation component be included, with an agreed format for the collection and recording of these stories. The Most Significant change method is explored below as a candidate for a format that could potentially be used by ZWN members.

3.4.1 Most significant change

The Most Significant Change (MSC) method is a form of participatory evaluation that collects significant change stories from an intervention and involves stakeholders to decide on the most significant change stories (Heck & Sweeney, 2013, p.50). MSC was developed and is commonly used in the international development sector (Wilder & Walpole, 2008, p.529), but is now also used in other spheres, such as education (Heck & Sweeney, 2013) and conservation (Wilder & Walpole, 2008). The primary purpose of MSC is facilitating programme improvement, via the regular collection and interpretation of "stories" about change rather than predetermined quantitative indicators (Dart & Davies, 2003, p.137).

Based on the case studies presented in Heck & Sweeney (2013), Dart & Davies (2003) and Wilder & Walpole (2008) as the basis, the MSC process can be summarised into the following steps:

1. The identification and selection of broad categories or domains of change for evaluation - these are identified by those facilitating the MSC process, in consultation with stakeholders, and appropriate data collection tools developed.
2. Identifying participant layers - as stories are collected these are sent up organisational layers for discussion and selection so clarity about who is included in this process is required.
3. Story collection - stories of change are collected from stakeholders close to the change being considered e.g.. clients and staff. This may be done in written or verbal formats.
4. Review and selection of collected stories - this can be done at regular points, or at the end of the collection phase. Selected stories may be shared only within the organisation (or in the case of ZWN, among the members only), or where appropriate, may be disseminated to other parties such as funders.

5. Discussion - the most significant stories are systematically selected and passed between the layers of an organization and feedback is provided to project stakeholders. Discussion about the stories enables both upward and downward accountability.
6. Verification. checking that details are accurate and gathering more detailed information
7. Quantification and secondary analysis - stories can be collated for meta-analysis to identify trends, and provide information about how well the system is working.

The main benefits of the MSC process are the focus on demonstrable change, rather than activities and outputs, often providing contextual evidence to better understand the relationships between the observed changes and the project activities (Heck & Sweeney, 2009, p.37). It can capture data about unanticipated outcomes, potentially including negative stories, and is especially good at capturing data on qualitative and intangible changes that would likely be missed by indicator based monitoring (Wilder & Walpole, 2008, p.532).

Key criticisms of the approach are that it is a time and resource intensive process (Davies & Dart, 2003, p. 16) and that it may be liable to positive bias via the deliberate collection of positive stories (Wilder & Walpole, 2008, p.532). The first of these is an important consideration for the CRE sector, as acknowledged in Section 3.2.1. A pilot project may be an important step in ensuring that the MSC process meets the expectations of the networks, and in building acceptance of its place in a shared approach. Clear instructions that positive and negative changes are acceptable could help mitigate the tendency towards positive bias.

3.5 Conclusion

This chapter has explored key academic contributions across a number of areas. First, impact focused approaches were explored by reference to literature from the non-profit and evaluation spheres. A key idea underpinning this research, that there are four dimensions to CRE impact, was then developed by an examination of literature relevant to each of these types of impact. In fulfilling the first research question ‘what methodologies and tools exist for gathering data on impact in the CRE sector?’ the main environmental, cultural, social and economic impacts of CREs were discussed with a focus on exploring what tools and

methodologies have been applied to inquiries of impact and outcomes, both in CREs internationally, but also in the wider non-profit sector. It was established that there is a wide range of approaches to measuring and reporting CRE impact, and that many of these contain useful lessons and/or basic structures that could contribute to a shared approach on Aotearoa New Zealand, while others were found to be unlikely to have application here. Finally, a discussion of the value of qualitative and quantitative data and measures lead to consideration of the Most Significant Change process. The next chapter will outline the methodological approach adopted for this research, explaining and justifying the research methods used.

Chapter 4. Research Methods

4.1 Introduction

Social research is the exploration of society and the world via purposive and rigorous investigation (Sarantakos, 2013, p.4). As the previous chapters have explained, the 'world' in which this research is concerned is the community waste sector in Aotearoa New Zealand. This chapter explains how the investigation was conducted - the methodology used in this mixed-methods study.

First, Section 4.2 explores how the investigation was designed, including the genesis of the research questions and the rationale for the research methods and tools selected. The procedures for sampling and data collection are then explained in Section 4.3 while Section 4.4 explains how the data was analysed. Finally, Sections 4.5 and 4.6 discuss the ethical and quality considerations and limitations of this research.

4.2 Research design

A series of theoretical foundations guide research design. Assumptions about the nature of reality (ontology), the nature of knowledge (epistemology) and how these should inform the chosen research methodology are made by the researcher. Taken together, these form a 'worldview' or 'paradigm' (Razaghi, 2016, p.39) which helps to determine how the research is constructed and undertaken, including the methods to be used (Sarantakos, 2013, p.29).

Creswell (2014, p.6) describes four main worldviews: Postpositivism, Constructivism, Transformative and Pragmatism. The main points of each of these are illustrated in Table 4.1. This research assumes that the nature of reality is constructed and subjective, rather than objective. There is no absolute truth sought by the researcher, instead this research seeks to present and understand the subjective meanings that various members of ZWN place on the concept of 'impact' and the value that their work has. With its focus on finding a solution for a real world problem, and the acceptance of a range of different viewpoints, the assumptions that lie behind this research are closely aligned with the pragmatic research paradigm.

Table 4.1: Major elements of Creswell's four worldviews (Creswell, 2014, p.6).

Postpositivism	**Constructivism**
● Determination ● Reductionism ● Empirical observation and measurement ● Theory verification	● Understanding ● Multiple participant meanings ● Social and historical construction ● Theory generation
Transformation	**Pragmatism**
● Political ● Power and justice orientated ● Collaborative ● Change-oriented	● Consequences of actions ● Problem-centred ● Pluralistic ● Real-world practice orientated

If research design is the architecture upon which data collection and analysis is built, decisions about the design of this research were heavily influenced by a number of factors. In particular, the structure and priorities of the Zero Waste Network, and my involvement in the organisation were important.

As discussed in Chapter 2, the organisational mission of the ZWN is to 'connect, educate, enable and inspire our members to reach their goals and to be a unifying voice' (Trotman, 2018, p.4). As the Executive Officer of the Network, broadly speaking, it is my job to make this mission operational via projects, events and relationship building. In this professional capacity I have a responsibility to understand the challenges and opportunities that exist for members of the network and, where possible, to address and/or leverage these for the benefit of members. In 2017, the concept of impact measurement and its potential value for our sector was discussed in a number of forums, culminating in a session at our annual hui on the topic. Following that, in a paper I was completing as part of my Masters coursework, I had the opportunity to research how impact reporting was being discussed and explored internationally. On completion of this research paper in 2018 I proposed a project to my Board of Trustees, who agreed it was an area worthy of attention, with the objective of developing a shared impact framework for the ZWN in the long-term. The network engaged two evaluation professionals to run a workshop for ZWN members on the topics and produce a follow-up report. At this point it was clear that further research was needed, particularly on

understanding the drivers and challenges from the perspective of members. This thesis represents the next phase of this research.

Another influential factor is the structure of the ZWN as a membership organisation. Members help determine the strategic priorities and the organisational work plan via ZWN's governance structure (a board of trustees made up of representatives of full ZWN members), involvement in project delivery and through regular consultations. This norm of member participation in projects provides context for the action research approach that has been taken in this research.

4.2.1 Research framework - action research

Action research is deliberate and systematically undertaken inquiry that is done *by* or *with* insiders to a community or organisation, rather than *on* or *to* them (Herr & Anderson, 2005, p.3). With a practical orientation on dealing with issues, problems, concerns and needs 'in the real world' (Denscombe, 2014, p.122), action research (AR) is a good methodological match for the pragmatic research paradigm (Razaghi, 2016, p.41).

AR exists in a variety of forms, varying according to the positionality of the researcher, the levels of involvement of the community being researched, and the level of concern with changing or challenging systems, policies and practices (Sarantakos, 2013, p.356). Avison (1999, p.95) suggests four main kinds of AR:

1. Traditional action research: focused on changing practices through a reflection on actions.
2. Action science: tries to resolve conflicts between espoused and applied theories.
3. Participatory action research: emphasises participant collaboration in the research process and the influences that the research process may have on the participants' lives.
4. Action learning: used for programmed instruction and experiential learning.

Razaghi (2016, p.60) maps different AR methodologies according to the level of specificity of the scope of the research and whether the focus is on improving practice or improving theory. A version of this is presented in Figure 4.1 below. Based on the context in which this

research occurs and my research question, I have chosen Participatory Action Research (PAR) as the framework for this research. Kemmis & McTaggrat (2007, p.280-283) propose the main characteristics of PAR are that it is a social process, with a strong focus on participation; it is practical and collaborative; critical; reflexive in that it can shape the consciousness and identities of participants (including the researcher), as well changing the social situation in which it occurs, and; it is aimed at transforming both theory and practice. These characteristics can be seen in this research, particularly in that it has a high degree of participation and collaboration from members of ZWN, and is aimed at improving both theory and practice.

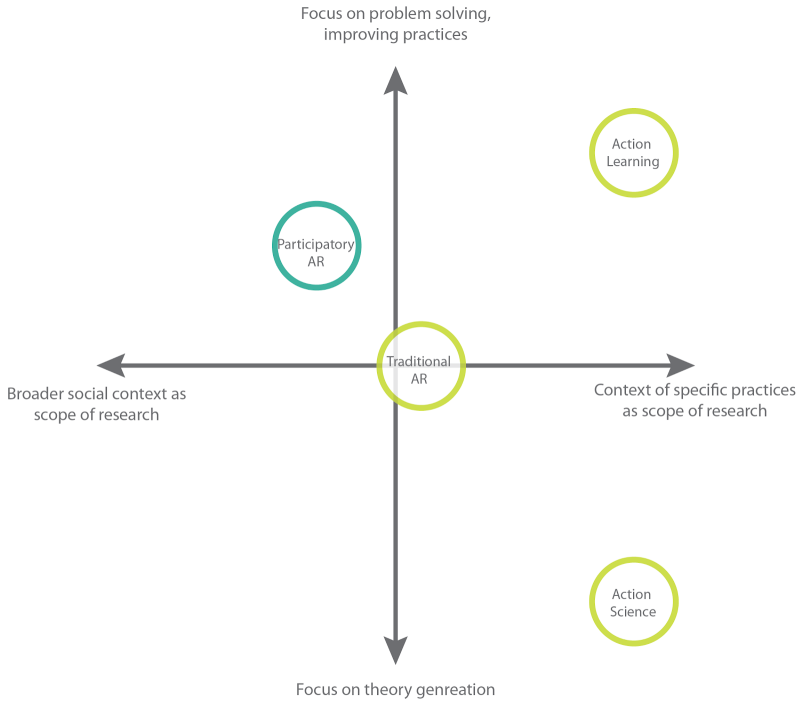


Figure 4.1: Classification of AR methodologies based on Razaghi (2016. p.54)

Participant collaboration, an important characteristic of PAR, is evident in the significant extent to which ZWN members contributed to the process. The research question was heavily influenced by the gaps identified in an earlier workshop and was formulated in consultation with members of the ZWN Board. Similarly, the design of the data collection phase was undertaken with close involvement from members of the ZWN Board, who trialled the survey before it was distributed to full members. Data collection was also iterative, with each tool developed using learnings from the previous one. ZWN staff and board members also

contributed to the focus group sessions as facilitators and note-takers, playing an active role in the research.

Herr and Anderson (2005 p.69-88) describe the AR dissertation as a process of "designing the plane while flying it". Because of the position of the researcher within the community of practice there are several questions that can be posed at the start of the process to inform research design:

- What data already exist?
- What data do daily work routines generate?
- What data needs to be explicitly added or generated?

As a practitioner, my engagement with the research topic and the research participants is not contained to this research project. In a sense, this research formalised and extended an inquiry that was already happening informally. Lune & Berg (2017, p.138) suggest there are four stages to an AR research process:

1. Identifying the research question(s),
2. Gathering the information to answer the question(s),
3. Analysing and interpreting the information; and
4. Sharing the results with the participants.

They argued that in AR these phases can spiral back into themselves more than they usually would in a traditional linear research process. As illustrated in Figure 4.2, this research involved cycles of data collection and analysis where learnings from interactions with both internal and external stakeholders were incorporated into the proposed impact framework and then reviewed by the same stakeholders in an iterative process.

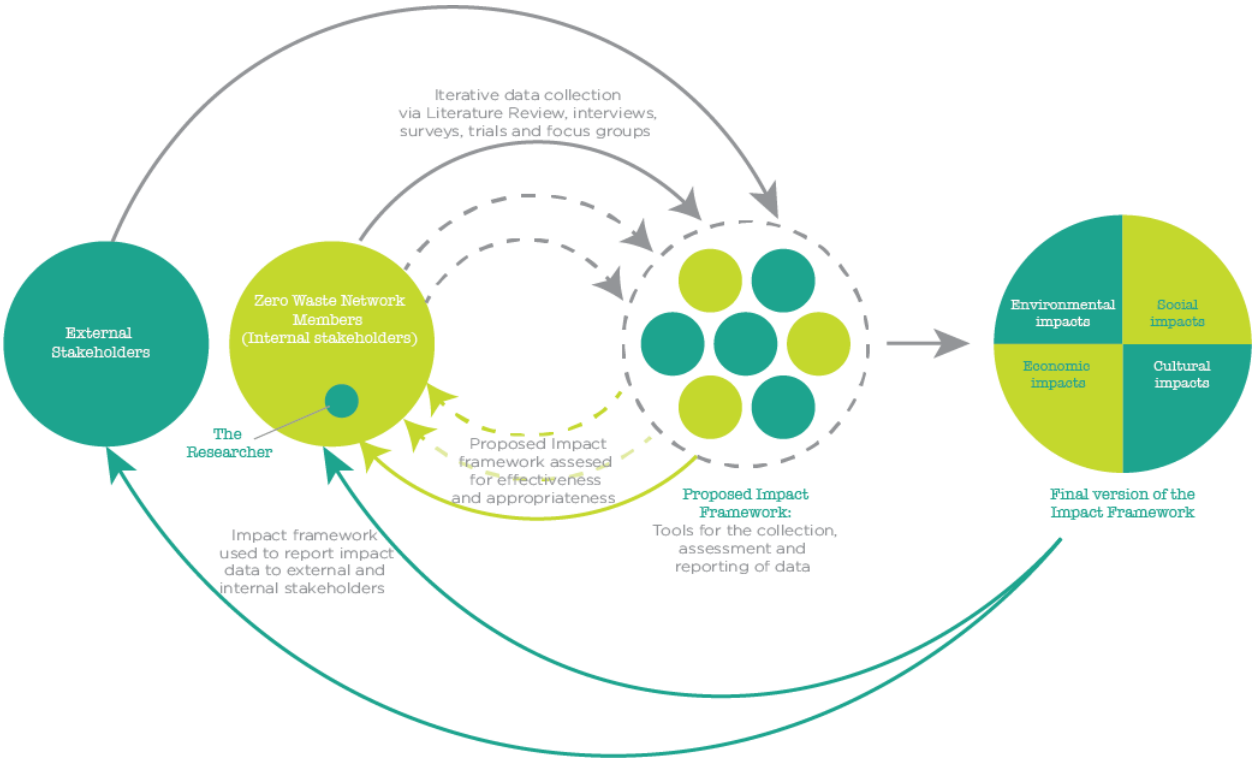


Figure 4.2: The iterative research process

4.2.2 Research questions

The aim of this research is to develop a framework of action towards shared impact reporting for the Zero Waste Network. The central research question that this thesis seeks to address is: What is an appropriate and effective framework for assessing the shared impact of the Zero Waste Network?

In exploring how to define 'appropriate' and 'effective' in this context, the following supplementary questions will contribute to answering the main research question:

- What methodologies and tools exist for gathering data on impact in the CRE sector?
- What measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work?
- What are practical and resource considerations that should be taken into account when designing a shared impact methodology for the ZWN?
- Which existing impact measurement tools fulfil the needs of ZWN members?

This research project was aimed at developing a roadmap for turning the 'idea' of a shared impact framework into a 'reality' in the context of ZWN.

4.2.3 Participants

In social research, a distinction is made between the 'target population' (the population for which the information is required), the 'survey population' (the part of the target population that is studied) and the 'sample population' (the part of the target population that is to be studied) (Sarantakos, 2013, p.167). Decisions around which sampling procedures (where and when the topic will be studied and who are the subjects) are a key aspect of research design (Sarantakos, 2013, p.121). By choosing either a representative or an exploratory approach, it is possible to produce reasonably accurate findings without the need to collect data from every member of the target population (Denscombe, 2014, p.32).

The target population for this research is the wider community waste sector of Aotearoa New Zealand; the survey population is ZWN. The sample population, in all instances but one, were representatives of ZWN members. One interviewee was based overseas, the rest in Aotearoa New Zealand. Survey and focus group participants held either employee or governance roles within ZWN member organisations. ZWN member organisations are either Charitable Trusts, Incorporated Societies, Councils or Businesses that are involved in resource recovery in Aotearoa and have applied for, and been approved, membership to the network by the ZWN Board of Trustees.

4.3 Methods of data collection

This research employed a sequential mixed methods approach, in that both qualitative and quantitative data was collected and analysed, and that the earlier phases of the research informed the instrument design of the next stage (Creswell, 2014, p.226). Four research methods were used to conduct this research: action research, interviews, surveys and focus groups.

Action research was used to:

- Frame the design of the research

- Identify existing impact measurement tools
- Obtain further information to inform the direction of the literature review, interviews, survey and focus groups
- Explore ZWN members' perspectives on the benefits and challenges of a shared approach
- Explore ZWN members' perspectives on some of the practical aspects of developing tools for the measurement of reuse and behaviour change activities.

The semi-structured interviews were used to:

- Obtain further information on certain survey elements
- Identify existing impact measurement tools
- Identify priorities for impact measurement from the perspective of a range of stakeholders

The survey was used to:

- Determine the extent to which participants perceive impact as important
- Explore the ways in which different organisations measured and reported impact
- Identify the priorities for impact measurement from the perspective of ZWN members

The focus groups were used to:

- Explore ZWN members' perspectives on the benefits and challenges of a shared approach
- Explore ZWN members' perspectives on some of the practical aspects of developing tools for the measurement of reuse and behaviour change activities.

The timing of how these different data collections occurred are presented in Figure 4.3 below.

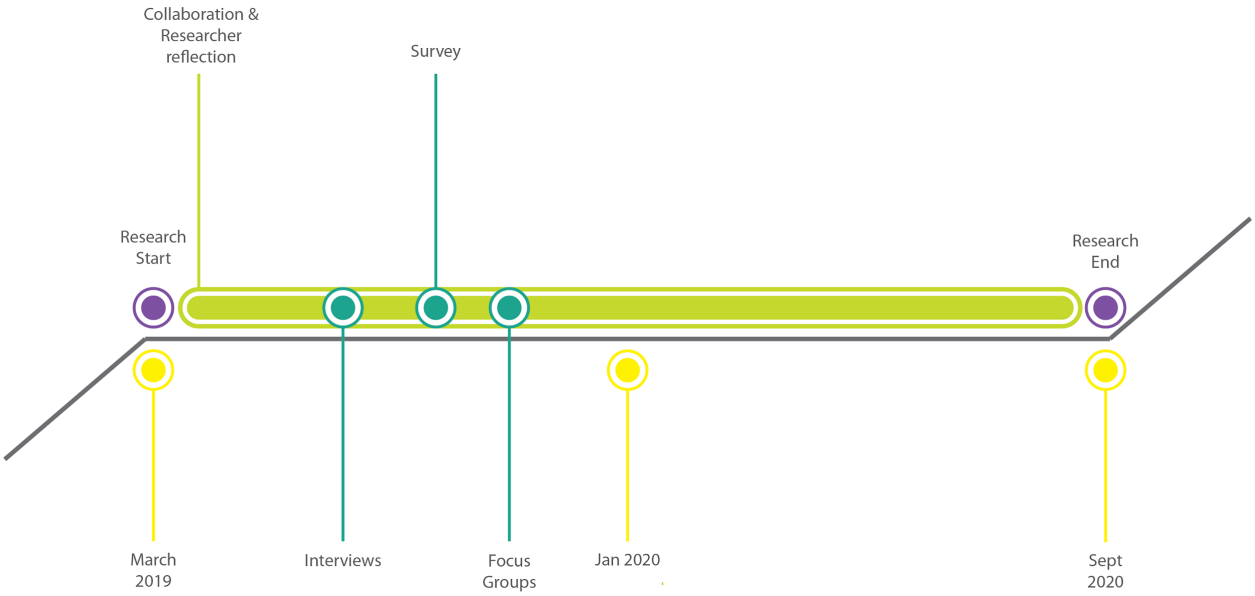


Figure 4.3: Timeline of research methods

4.3.1 Collaboration and researcher reflection

Action research contributed the overall approach to this research and a number of research methods. As discussed above PAR involves a high degree of collaboration with research participants. Alongside this, critical reflection on the experiences that emerge during the course of the research is a key element for learning in an AR inquiry (Razaghi, 2016. p.54). Through interacting with members of ZWN and other stakeholders as part of my job I am exposed to information that is relevant to the research topic. The dataset for this research is extensive, and includes research journals of notes from conversations and meetings I have had, emails and letters, meeting minutes and workshop presentations. This data has been integrated into the design, results and conclusions of the research. The following account of the development and use of a spreadsheet to collect and analyse options for impact measurement tools illustrates the role of collaboration and reflection in the data collection phase of the research.

Options for impact measurement tools spreadsheet

A spreadsheet that I named 'Options for impact measurement tools' was developed very early on in the research process, directly after the research proposal was completed and the literature review was underway. At this point, some of the basic design features of the future impact framework were already known and these were integrated into the design of the

spreadsheet - for example there are four sections, reflecting the four impact types, the production of qualitative or quantitative data as a key consideration is reflected in a columns dedicated to this, and activity type (reduction, reuse, and recycling) also have dedicated columns. This spreadsheet is attached as Appendix 2.

During the course of the research, the spreadsheet was frequently amended and added to, for example, after visiting a ZWN member site in the course of a training project, information about how that member reported their return to their local economy was added as a potential measure of economic impacts. Similarly, after conversations with the Department of Internal Affairs on how the Charity Services annual return process works, notes were added regarding the potential for a reporting template being developed. Selected representatives of ZWN members were also asked to help define options for the spreadsheet based on their previous expression of interest in the topic. For example, an email conversation between myself and two ZWN members was used to further define the options for cultural impacts.

The spreadsheet was used as a prompt in the interviews to encourage interviewees to discuss the types of impacts they saw as priorities. One interviewee offered several new potential tools which were added to the spreadsheet. The ideas contained in the spreadsheet were also used in the construction of some of the survey questions - particularly the section that asked participants to indicate the usefulness of potential measures.

At regular intervals, I would return to the spreadsheet, examine any new findings and integrate these into the spreadsheet. Frequently, this happened during or directly after discussions with my research supervisors, or consultation with members of the ZWN Board. Often, I seemed to need to go through the process of saying things out loud before several pieces of new information came together to form a new direction.

4.3.2 Interviews

Interviews and surveys are both research methods in which the data produced is not observational, but instead comes from participants self-reporting (Denscombe, 2014, p.184). The semi-structured one-on-one interviews were considered as “meaning-making occasions” where, I, as the researcher exchanged thoughts and ideas and followed topics that were raised by the interviewees, with the assumption that I did not know what all the necessary questions

were before I started the interviews (Lune & Berg, 2017, p.67-68). As each interview took place, I interpreted the information from previous answers in order to form the questions following. This form of interview differs from a structured one, where the researcher has a fixed standardized list of questions (Denscombe, 2014, p.186).

The interviews in this research were used primarily to obtain data from two organisations. One of these is an associate member of ZWN, and an organisation that has funded ZWN and ZWN member projects over a period of almost 10 years. The second organisation is not based in Aotearoa New Zealand, and fulfills a similar role to ZWN in its country of operation. The semi-structured interview design was chosen for its flexibility, but remained guided by the research purpose and questions. Both interviewees had been involved in projects focused on developing methods for articulating the value and/or impact of the community waste sector, so each interview started with questions exploring their learnings and experiences from involvement in those projects. The interviews also sought the interviewees' perspectives on the types of impact important to include in a shared impact framework; the audiences of impact data, and what their priorities around impact are, and; key practical design features of an impact framework.

Both interviews took around 60 minutes and were recorded. One was in person, and one took place over a video conference. Consent to record was given via a consent form and by verbal confirmation.

4.3.3 Survey

In August 2019 a written survey was distributed electronically using the Surveymonkey platform to the 55 full members of ZWN. Requests were made via email and two follow-up email reminders were sent.

The survey tool (included as Appendix 3) was an opportunity to ask a number of the research questions to ZWN members directly, and to produce a consistent, convenient set of data (Sarantakos, 2013, p.273). It consisted of 38 questions, divided into three main sections: These covered:

1. General information, including contact details and information about the activities undertaken by the organisation.
2. Reporting and measurement: information about the current impact reporting practices of the organisation, audiences for this information, and participants' perceptions on the importance of a range of design considerations.
3. Current practices and perceptions of usefulness of different impact measures across four impact types: social, cultural, economic and environmental.

The questions included in the survey were mostly close ended, fixed alternative questions that adhered to the methodological requirements of being exhaustive, accurate, mutually exclusive and unidimensional (Sarantakos, 2013, p.356). Some of these took the form of Likert scale questions. A Likert scale includes response categories that range between two extreme positions divided into points corresponding to a numeric scale (Sarantakos, 2013, p.260). For example, possible answers on the ordinal scale to the question "Please indicate how USEFUL you think the following measures of social impact would be for your organisation" ranged from 'Not at all useful' to 'Extremely useful'. A neutral category in the form of 'not sure' was included to ensure the response sets covered all possible options (Sarantakos, 2013, p.258).

Nine open-ended questions were also included, generally following a fixed alternative question, with the purpose of eliciting further information on a topic and as a way of ensuring novel ideas and concepts could be introduced. The inclusion of a series of questions around current activities, organisational mission and goals (for example 'What is the purpose or mission of your organisation?' and 'In your own words, please briefly describe what kinds of impact your organisation aims to achieve") had the purpose of exploring the scale and scope of the work being undertaken. As discussed in the previous chapter, this is considered as a useful starting point for developing appropriate impact measures.

The survey was pre-tested on two members of the ZWN Board, with feedback focused on the clarity and arrangement of the questions. The survey took an average of 25 minutes to complete. 31 responses were received, across an eight week time period. Three of the 28 responses were significantly incomplete (with only the contact data filled in) so only 28 responses were included in the analysis.

4.3.4 Focus groups

Focus groups are guided or unguided group discussions addressing a particular topic of relevance to the research, where the data from the group itself is the unit of analysis (Lune & Berg, 2017, p.94). Led by the researcher, who acted as a facilitator and arbitrator, the purpose of the focus groups in this study was to access the construction of meanings within the group (Sarantakos, 2013, p.207).

The focus groups took place as part of the Strengthening Communities Hui, an annual event hosted by the Zero Waste Network, the Community Energy Network and Environment Hubs Aotearoa. In total 45 representatives of ZWN member organisations attended the event and took part in the focus groups. The session took 1.5 hours.

I first presented a short report back on the progress of the shared impact framework project up to that point, including initial results of the survey. The aim of this was to provide some context to the focus groups. The room was then split into five groups of 6-10 people. Participants were asked to self-select a group, based on their experience and/or interest in the following:

- Establishing conversion factors for reusables (one group)
- Reuse categories (two groups)
- Behaviour change (two groups)

Each table was allocated a facilitator. Facilitators were members of either the ZWN Board of trustees or the ZWN staff team, and had been provided both written and verbal briefings of the session beforehand (see Appendix 4).

Each table was given a series of questions to discuss, and each facilitator used their own discretion on guiding the conversation through the questions. Not all groups covered all the questions. The facilitators were tasked with keeping the conversation moving, rather than directing it in a particular direction. Prompts, such as printed examples of reuse categories used by other networks and an illustration of a logic model illustrating the differences

between outputs and outcomes/impacts were provided to facilitators and used to encourage conversation.

Each group was allocated a note taker and participants were encouraged to write their thoughts on post-it notes. The role of the note taker was to help with the data collection process. They were briefed to note key themes, focusing on important points rather than everything that was discussed. To ensure confidentiality they were asked to not attribute comments to individuals.

Two focal questions were asked of each group:

1. What would make a shared impact framework useful to you?
2. What are the barriers to adopting standardized systems?

Each group was also provided a series of additional questions, specific to the topic their group was focused on as outlined in Table 4.2.

4.3.5 Sampling

Exploratory, nonprobability sampling was used. Interview and survey participants were chosen for their attributes in a form of purposive sampling (Lune & Berg, 2017, p.39). For example, the survey was sent to all full ZWN member representatives listed on the ZWN database. It stated "The survey is best completed by someone at senior management level, who has a good understanding of the current activities and reporting practices of your organisation". In nine cases it was forwarded on from the initial contact to someone within the organisation better suited to complete the questions. In the case of the focus groups, the sample was a convenience sample in that participants were attending the ZWN hui and took part as part of a workshop held as part of the hui programme.

Table 4.2: Additional questions for focus groups.

Focus Group	Questions
Establishing conversion factors for reusables:	1. At what part of the process does it make the most sense to record data about reusables? 2. What type of data would we capture (volume, weight or number)? 3. What are your suggestions for how we could establish agreed conversion factors?
Reuse categories:	1. What needs to be considered when choosing a shortlist of reusable products to be included in reuse impact reporting? 2. What are your suggestions for reusable product types that we should focus on?
Behaviour change:	1. What are the key things about our education activities that are worth focusing on to tell our impact stories effectively? 2. Given the complexity of behaviour change, how could we capture the outcomes of our education and engagement work?

4.4 Methods of data analysis

Data analysis is a key sense-making phase in the research process. It involves the systematic examination and interpretation of data in an effort to identify patterns, themes, assumptions and meanings (Lune & Berg, 2017, p.182).

First, the interview, survey and focus group data was entered into a single Excel spreadsheet. Each interview was allocated a separate tab and further organised into three sections:

1. Main points
2. Quotes
3. Points to follow up

A separate section was allocated to each interview. For ease of use, the survey data was split into three separate sections mirroring the three main sections of the survey. For the focus groups each of the different topics was allocated a separate tab.

Manual and electronic ‘open coding’ was a key method of data analysis for this research. Open coding is a process of labelling, separating, compiling and organising data, with the aim of identifying key concepts and dominant themes (Sarantakos, 2013, p.372). It is an effective and practical way of checking that the qualitative data are addressing the research questions (Pizzirani, McLaren, Forster, Porou & Warmenhoven, 2018, p.669). Electronic coding was undertaken using QSR International’s NVivo 12 quantitative software analysis programme. Once codes were established, these and the associated coded material were able to be highlighted and sorted. The ‘explore’ and ‘view’ functions of NVivo were used to identify the following dominant themes from the interviews and focus groups:

- Audiences for impact data
- Types of impact
- Impact framework design
- Benefits and barriers to a shared impact framework

4.4.1. Quantitative data analysis

In addition to the coding of the qualitative data, some basic quantitative data analysis was undertaken. This was the checking, editing and presentation of group data from the written survey. This was done using the Survey Monkey platform, from which the survey had been sent from. As mentioned in Section 4.3.3, three submitted surveys were found to be mostly incomplete, and these were removed from the pool of available data, bringing the total to 28 usable responses. Survey Monkey provides basic aggregation and synthesis tools, in the form of automatic rate, ratio and percentage analysis, and produces graphs to present the final results, and it is these graphs that are presented in Chapter 5.

4.5 Ethical considerations

The Massey University Code of Ethical Conduct for Research, Teaching and Evaluations Involving Human Participants guidelines was used as a starting point for a conversation about ethical considerations with the project supervisors, and to develop the research proposal and an ethics application (Appendix 5). The project was identified as high risk on the basis of there being an existing professional relationship between the researcher and the participants. The research proposal was then considered by the Southern B Massey University Human

Ethics Committee and in July 2019 I attended a meeting with my supervisor to discuss the project, with special consideration given to the power relationship between the research and participants and the potential for a conflict of interest. Approval for the project was granted on the condition that the researcher drafted a letter to the Board of Trustees to seek permission for the research to be undertaken and requesting access to email addresses and details for research purposes. This letter and the response are included as Appendix 6 & 7.

One of the main ethical considerations relating to this research relates to the PAR framework. PAR is an interventionist approach which can affect the research participants, so the recognition and mitigation of conflict of interest and informed consent are important (Razaghi, 2016, p.80). Informing all participants they had the right to not take part in the research and the use of informed consent processes were the main methods used to mitigate any potential conflict of interest as a result of the PAR framework.

As discussed above, I have an existing professional relationship with the potential participant organisations. I have been in this role for seven years and have had a range of interactions with ZWN members and their staff, from email conversations, visiting their sites and working closely with some member representatives closely on a range of projects. The ZWN Board of Trustees who provide oversight to my role, are drawn exclusively from ZWN member organisations. Over the course of the research I discussed my research with several members, in particular the Board of Trustees, and reported the findings of my previous research back to them at our annual hui and other forums.

Potential conflicts of interest were also mitigated via transparency about my dual roles as Executive Officer of ZWN and as a Masters Student to all participants and in any written reports. Informed consent was gained from participants by providing them with an information sheet before taking part in the research and giving them an opportunity to have their questions about the research project answered during the recruitment phase and before data collection was conducted, and by receiving written consent. Examples of the information sheets given to participants are included as Appendix 8.

Other ethical considerations were explored and mitigated via regular reflection, discussion and inclusion in the research design. The Treaty of Waitangi and the principles of tika

(purposefulness) and manaakitanga (respect) were considered in the research design, most specifically in the exploration of cultural impacts as one of the areas to research. The research acknowledges the value of titiro - listening before korero (speaking) - in that it aims to put ZWN members at the centre of the research and take their views into account. The principle of whakapapa and the cultural values of manaaki ki te tangata (collaborative learning and sharing of results) and kaua e mahaki (being humble with your knowledge) were considered. The research acknowledges that the data and findings contained are in thanks to the generosity and existing knowledge of the participants, and the network as a whole. Participants and members of the ZWN were given access to the research findings for their individual and collective use throughout the process - for example, the researcher presented an update on the research at the annual members hui and made this presentation available to members and hui participants for viewing and use via direct email communication and the ZWN newsletter. Regular sessions with my supervisors, and relying on the expertise of my supervisors to challenge any potential unethical biases, alongside self-reflection were used to eliminate biases. Confidentiality was maintained by removing any contact details and information about identifiable individuals and organisations in the research findings, except in the case of the interviews where explicit consent was given.

4.6 Quality considerations

Social research is expected to adhere to certain standards and principles, ensuring quality of research (Sarantakos, 2013, p.88). Validity refers to the accuracy and precision of the data being used in the research and the appropriateness of that data in relation to the research question being investigated (Denscombe, 2014, p.271). Differences in the types of validation exist for qualitative and quantitative research, with quantitative research being concerned with relevance, accuracy and precision (Sarantakos, 2013, p.99), while trustworthiness and credibility are important in qualitative research (Sarantakos, 2013, p.102; Herr and Anderson, 2005, p.52). Furthermore, Herr and Anderson (2005, p.50) discuss the difference between internal validity (the trustworthiness of inferences drawn from the data) and external validity (how well inferences generalise to a larger population or are transferable to other contexts). Action research, with its focus on generating action as well as knowledge, and the common ‘insider’ perspective, is recognised as having a different set of standards for validity than other research, even other qualitative research (Herr and Anderson, 2005, p.52).

Bradbury (2015, pg.8) proposes seven criteria for what constitutes quality in action research. Following Razaghi (2016. p.54), this action research inquiry has been evaluated against these criteria in Table 4.3 below.

Table 4.3. Evaluation of this research against Bradbury's Quality Criteria for Action Research

Quality Criterion	**Evaluation**
Articulation of objectives	The research questions and objectives were described clearly to the participants and in this thesis
Partnership and participation	ZWN members and stakeholders have been significantly involved in the scope and design of the research. There was scope for increasing participant involvement in the later stages of the research.
Contribution to action research theory–practice	This inquiry is based on a thorough review of AR literature
Appropriate methods and process	AR processes and methods are articulated and illustrated in this thesis. Articulating the perspectives of the participants is a focus of the research.
Actionability - providing new ideas to guide action in response to need	An array of potential actions have been identified
Reflexivity of the researcher on their role in the action research process	Self-reflection was a feature of the research, including regular reflection sessions between the researcher and supervisors, and researcher reports to the ZWN Board. The dual role of the researcher was communicated to participants.
Significance - meaning and relevance beyond their immediate context	Practitioner-led research is a significant source of literature on the topic of CRE impact. The strong links to the academic literature in this inquiry could be valuable to future research.

In addition, this research employed triangulation in the data collection and analysis phases to ensure research quality. Triangulation is the practice of using several research tools within the research design (Sarantakos, 2013, p.159).

4.7 Conclusion

This chapter provided an overview of the research design and data collection and analysis methods used in this thesis. Participant Action Research, a form of action research that prioritises participant involvement in the design and implementation of the research, and has a goal of the research being useful for those same participants, frames the rationale for the research and the strategies employed. The research questions and participants were defined. This research utilised a number of data collection methods. In acknowledgement of the PAR framework, an account of how collaboration with ZWN members and researcher reflection produced data was provided. Three other data collection methods were employed: interviews, a survey and focus groups. The combination of these methods allowed for a variety of qualitative and quantitative data to be collected, these have been analysed using coding and basic statistical analysis methods. Finally, the chapter detailed the ethical and quality considerations. The next chapter will explore the findings drawn from the data.

Chapter 5. Results

5.1 Introduction

This chapter presents the data collected using each of the research methods undertaken as part of this research. It is divided into five sections. Section 5.2 is dedicated to the autobiographical data collected as part of the action research approach employed in this research. Section 5.3 covers the main findings drawn from the two interviews undertaken. Section 5.4 summarises the findings from the survey focusing on reporting back ZWN members' purposes and activities, current impact measurement practices and their perceptions of the concept of impact. Finally, Section 5.5 presents the results of the focus groups, and Section 5.6 concludes the chapter.

5.2 Autobiographical data

AR is "characterised by its use of autobiographical data" (Herr and Anderson 2005, p.77). The following section offers an account of my experience of being a practitioner while undertaking this research. As outlined in Chapter 4, a wide range of interactions and activities informed the research process, and I kept a record of these via a range of written materials.

Each of these contributed to my learning, and the final direction of the research. To illustrate how these contributed to the findings of this research, an account of how the '*Options for impact measurement tools'*, introduced in Section 4.3.1, offered multiple opportunities for learning is presented. As discussed in Section 4.3.1, the '*Options for impact measurement tools'* spreadsheet was the tool I used to capture information from a wide range of sources. It also served as an initial sense making tool, as I used it to define options for impact measurement and to develop my understanding of different characteristics, and how these were expressed differently across the range of options. One of the key results from this process was gaining an understanding of what tools were not going to be feasible. For example, establishing a single multiplier factor to identify ZWN members contribution to the local economy would entail significant economic analysis and, with the wide variety in the

size of ZWN member operations and the types of communities they operate in, it would be difficult to establish a rule that would contribute useful information for the sector as a whole. It was only after a range of conversations with ZWN members and stakeholders, and after analysis of the relevant literature, that I came to the conclusion multiplier factors were not suitable for inclusion in the framework. As useful information was collected for the forming of this position, I noted it down in the spreadsheet.

Inputting data as I went gave me an appreciation for the amount of effort already going into the measurement and reporting of impact within the network. It gave a sense of both how important groups felt about telling their organisational impact stories, but also how limited time and resource for developing robust processes to do this was amongst the membership.

In the lead up to the ZWN annual hui where I was due to report back on the progress of the research, members of the ZWN staff worked with me to develop an example dashboard of key impacts (sas illustrated in Figure 5.1). This was developed to report our annual impact, and to provide a relatable example for the report back to members. To do this, ZWN's project administrator and myself went through the '*Options for impact measurement tools'* spreadsheet and established which of the measures we could realistically and effectively use to calculate the impact of the activities that ZWN undertakes (i.e. ZWN organisational activities, rather than the activities of our members). As a national support organisation for CREs, the activities of ZWN are not completely aligned to those of our members, however, we undertake a number of activities and projects that are similar in terms of how they are delivered (e.g. training projects) and outcomes they aim to achieve (e.g. behaviour change and diversion from landfill). The process of measuring our own organisational impact offered important insights into the resource requirements and sources of impact data for undertaking reporting across the four impact themes. For some of the measures it was a simple process – for example, with a team as small as ours, calculating the employment data was at that point as easy as counting to four. Other measures took quite a lot of research. Calculating the GHG emission saving, for example, involved sourcing two separate conversion methodologies from overseas as none currently exist in NZ. In wanting to be upfront about this, we included references to the tools on the dashboard.

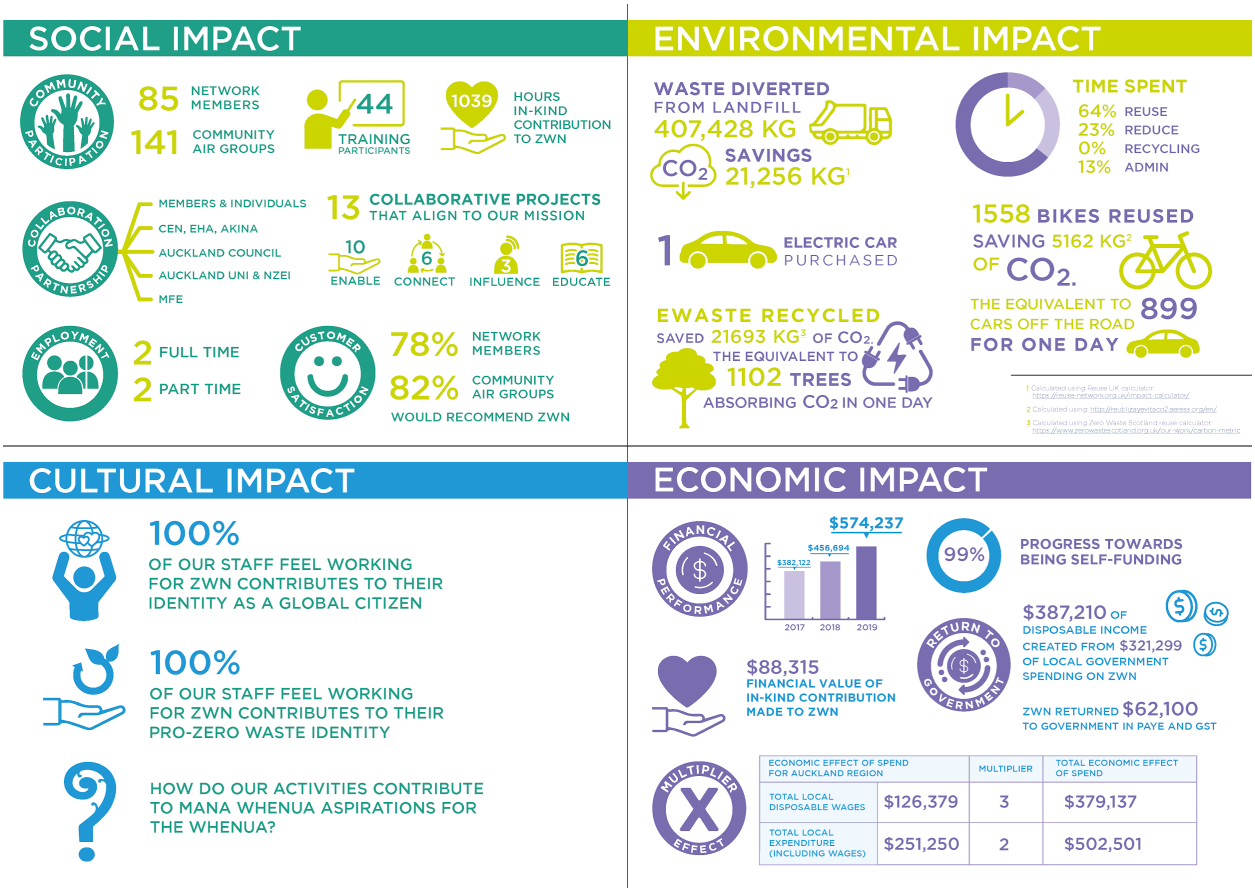


Figure 5.1: ZWN reporting dashboard showing a range of impacts from 2019 (ZWN, 2019)

As part of the dashboard development, we wanted to investigate the impact that ZWN's own organisational culture has on its staff. To this end, we developed a short staff survey and presented two of the results in the cultural impacts section of the dashboard. The third item included in this section was whether or not ZWN's activities contribute to mana whenua aspirations. Although we were unable to answer this, we felt this potential measure was important enough to warrant inclusion on the dashboard, partially in recognition that many of our groups would be in exactly the same position.

The dashboard offered a concise way of presenting the opportunity for the shared impact framework to ZWN members at the Strengthening Communities Hui in October 2019 and I was approached by a number of members for more detailed information, leading to a number of conversations that were important for my learning and changes to the *Options for impact measurement tools* spreadsheet. The final version of the spreadsheet is reflected in the framework presented in Section 6.6.

Another key result taken directly from my experience as a practitioner researcher was the final approach to cultural impacts. This fourth aspect of impact was originally added when my initial desk-based research was reported back to a group of ZWN members at a ZWN training event, and there was a suggestion made by a member of that group to include engagement with the Treaty of Waitangi as an aspect of cultural impact. Following this suggestion led me to explore literature concerned with the four pillar model of sustainability, and into the debates around the difference between cultural and social dimensions. I framed up a sketch of what might be possible in regards to incorporating a cultural dimension to the shared impact framework and sent this via email to two ZWN members, one a member of the ZWN Board, and the other, the person who suggested it in the first place. Their responses were extremely useful in the refining process, where many of the first iterations of the ideas were abandoned. I then asked my supervisors if there was anyone at Massey University who might be able to offer guidance, and I was put in touch with an Associate Professor from Te Putahi-a-Toi – School of Māori Knowledge. Her suggestion to consider the relationship with mana whenua as a key starting point was presented to members at the Strengthening Communities hui and is included in the final framework, presented in Section 6.6.

5.3 Interview data

As discussed in Chapter 4, formal semi-structured interviews were conducted with two representatives of stakeholders external to ZWN. Both interviewees were practitioners in the resource recovery sector, Interviewee 1 within the CRE sector overseas, and Interviewee 2 in local government in Aotearoa New Zealand. Both interviewees have extensive experience in the CRE sector in a range of roles. Interviewee 1 has extensive CRE management experience, and is involved in national and regional project coordination and research. Interviewee 2 has decades of experience in the sector, including national and regional strategy implementation, regional policy development, project development and delivery, and the funding resource recovery projects. At the time of the interviews, both interviewees were involved in research projects looking at the impact of community resource recovery projects as part of their work. These research projects were the starting point of both interviews, with the initial questions focused on the goals and structure of each project. Both projects had a strong focus on gathering quantitative data, and in one case the aim was to use cost-benefit analysis to monetise the impacts of resource recovery operations. Interviewees said this focus on

empirical data was in recognition that current decision-making processes often “come down to budget”, and that “counting what currently isn't being counted... in a way that aligns with established ways of counting” increases the chances of the data being used in decision-making.

5.3.1 Audiences for impact data

The main audiences for impact data identified and discussed during the interviews were policy makers and funders, which were seen as closely linked - “it’s about getting funding and political buy-in. The two go hand-in-hand”. Impact data was seen as being key to making a case for investment, and for changing policy. For Interviewee 1, an explicit goal of their CRE-led study was to support the case for including reuse in their Government to “step in and create the right incentives. The fact that doesn't happen with reuse means it has a huge disadvantage in the market”.

The role of local councils was discussed in depth, particularly in examining what data is considered most useful to council audiences and the resourcing of the development of robust data collection processes. Interviewee 1 felt it was a “sad state” that councils are not paying for impact measurement activities, when it is they who often require data collection to occur as part of the allocation of funding and/or contracts. The types of data required by councils in contracting environments was recognised as often being very specific and relating to practical operational outputs such as waste diversion and number of customer interactions. However, in recognising that local councils are often large organisations with a wide mandate, the interviewees highlighted that other types of impacts such as contribution to the local economy, may be of interest to other parts of the council that are not responsible for the delivery of waste services.

It was noted by both interviewees that there are other audiences for impact data, with one stating the value for the organisations themselves, because if impact measurement is done well “they will understand their own operations better”. Benchmarking between similar organisations was also identified by Interviewee 2 as having potential value for internal strategy setting.

5.3.2 Types of impact

Both interviewees agreed that the impacts of the community waste sector are multi-faceted, and that efforts to capture the impact need to be similarly multi-dimensional as "there are different measures for different purposes".

Several financial and social impacts were discussed in depth. In discussing their own impact measurement research, exploring the impact of a similar network of CREs overseas, Interviewee 1 talked about the importance of the concept of employment intensity. Their research found that reuse activities create significantly more jobs than any other resource recovery activity. This was seen by both interviewees as being a compelling argument for political support and financial investment for reuse activities. Data on employment in the resource recovery sector in New Zealand is limited, and further work in this space was recognised as a key opportunity.

It was also recognised by one of the interviewees that there is a significant challenge in being able to offer a network-wide account of the impact of many of the activities undertaken by the community waste sector, due to the lack of a common way of talking about them and a desire to honour the diversity among the members of their network:

> Qualitative stuff might be best for individual organisations to develop because they're not based on a normative objective of what we're all trying to do, but are about narratives and people's experiences. We should give people tools to collect and communicate them… but everyone is super different so their stories need to be different (Interviewee 1).

Data about in-kind contributions and additional funding secured were suggested by one interviewee as additional measures of financial impacts. Their reasoning was that:

> Data around in-kind contributions can be considered as 'added value'. This is an important point of difference for community organisation compared to commercial providers... so the story could be: council put in this much, but x was contributed by the community (Interviewee 2).

This was identified as attractive for council stakeholders. Similarly, for funders such as councils, data on how much other funding has been found was identified as important for

making an on-going case for investment in the sector. Match funding and scaling from seed-funding are seen as positive stories that it would be good to capture.

5.3.3 Impact framework design

Both interviews covered the structure of an effective impact framework. For Interviewee 2, the very process of establishing the framework was key:

> It's wonderful that ZWN is doing this project. You are the industry experts. People aren't too worried about what the measure is, just that there is one, and that is widely accepted. The standardisation conversation is really helpful (Interviewee *2*).

Data on diversion is the starting point for many existing impact measurement activities, but the lack of standardisation within this space is recognised as a significant challenge. A suggestion was made that establishing standardisation and conversion processes for a limited number of waste streams - those it is "easier to get metrics on, and where there is already data" would be a good place to start.

Across both interviews there was recognition that tonnage (the most common metric for reporting diversion) was not sufficient for reporting impact: "waste data by waste stream is more important than just a single number". An argument for considering waste streams down to their material type (e.g. a couch is made of X amount of wood, X amount of fabric and X amount of metal) was given by one of the interviewees:

> When it comes down to it we are talking about the avoided environmental impacts of a) landfilling of a thing b) recycling of that thing or c) the avoided impact of someone purchasing a new thing. With those three types of impact it does come down to materials at the end of the day and it's important to acknowledge the differential impact of reusing different materials. Something plastic...is going to be terrible in the landfill. Breaking it down to materials does make sense from a larger narrative perspective (Interviewee 1).

However, it was acknowledged that it would require significant further work to establish the baseline data to allow wide take up of such material type analysis. Construction & demolition waste and organic waste were identified by one interviewee as being important waste streams to measure diversion in, due to their GHG emissions impacts.

Both interviewees were asked about tools for collecting data. One interviewee made a suggestion of using a 'product tracker' excel spreadsheet, that currently forms the basis of the waste diversion reporting undertaken by several ZWN members. The other interviewee discussed the potential for a software based solution that would take data produced at a weighbridge and/or point of sale system, and aggregate it according to agreed categories, thereby automating a large part of data collection. It was acknowledged that whatever the final design of the tools, additional resources would be needed for rollout, training and updates.

5.4 Survey

As outlined in Chapter 4, the survey was sent to 55 full and associate members via email, and 28 responses were received. It asked 30 questions covering the current impact measurement and reporting practices of ZWN members and their opinions on a potential shared impact model.

5.4.1 Purpose, activities and goals

Participants were first asked about their organisation's mission, goals and the type of waste activities they undertake. 28 participants responded to the question: 'What is the purpose or mission of your organisation?'. A frequency analysis of these mission statements offers the following insights:

- 22 out of the 28 respondents referred to the community within their stated mission. 9 of these referred to their local community by name while others used more general descriptors such as 'our community' or 'the local community'.
- 16 respondents referred to 'waste' or 'resource recovery'. 'Waste' was referenced using a number of related terms including: waste reduction, zero waste, resource recovery, reuse, resourcefulness, and recycling.
- Broader environmental concerns were also commonly referenced, with four respondents using the term 'environment' and 8 respondents referring to sustainability.

Eight possible goal statements were presented (as outlined in Table 5.1) and participants were asked to select those that were goals of their organisations. All 28 participants agreed that diverting waste from landfill was a goal of their organisation. 27 respondents agreed their organisation involves their local community. These results align with the high occurrence of the term community in the organisational mission statements. All of the goal statements were identified as applying to at least half of the participating organisations.

Table 5.1: Agreement with goal statements

Goal statement	**Percent of respondents agreeing with the goal statement**
We are diverting waste from landfill	100%
We are involving our local community	94.43%
Zero Waste is important to our community	89.29%
We have a positive influence on people's waste behaviours	85.71%
We are contributing to our local economy	82.14%
We are creating meaningful employment	67.86%
We are creating inclusive employment	53.57%
We are financially sustainable	50.00%

Participants were asked what waste related activities their organisation undertakes, and which of these they considered to be the primary activity. Recycling and reuse are each undertaken by 24 of the responding organisations, while zero waste education is undertaken by 17 of them. Other activities identified by participants were event waste management (four responses), landfill weighbridge management (three responses) and waste collections (one response).

As shown in Figure 5.2, 13 respondents identified reuse as their organisation's primary activity, followed by zero waste education (9 respondents), and recycling (5 respondents). One organisation specified repair and refurbishment as the primary activity. As discussed in Chapter 2 , these can be considered as a subset of reuse.

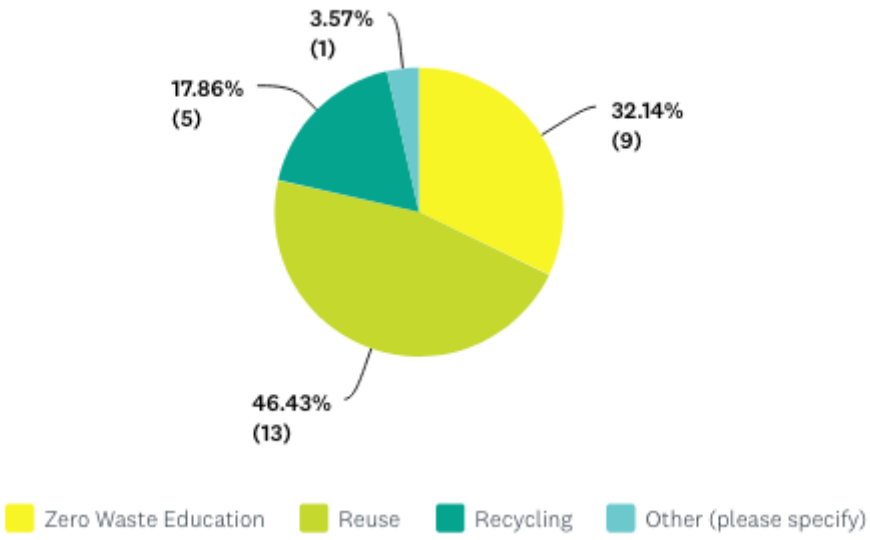


Figure 5.2: Primary activity of ZWN members

5.4.2 Current impact measurement and reporting practices

To explore the practicalities of joint reporting, the first three questions in this section of the survey asked about the type of reporting currently undertaken and the timing of this reporting. 24 respondents complete funding and/or contract reports, 20 produce an annual report and 18 complete a charities services annual return and board reports. Responses for when Year End accounts are completed were split between 31 March and 31 June balance dates (11 respondents each), with two on 31 December. This lack of a common date will have implications for when data collection for measuring shred impact is undertaken, which will be further discussed in the following chapter.

Participants were asked if they measure any impacts across the four impact types, and waste diversion. The results are shown below in Figure 5.3. Waste diversion was the most commonly measured impact, with social impacts and financial impacts also widely measured.

Cultural impacts were reported to be measured by just three of the 24 organisations who responded to the question.

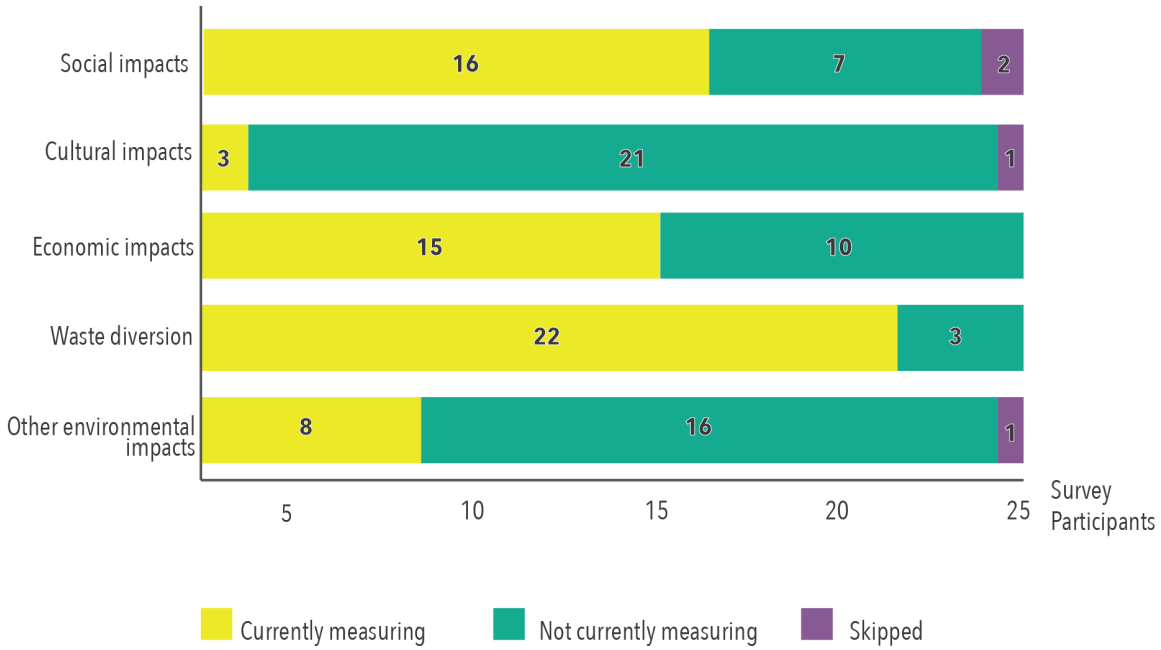


Figure 5.3: Current impact measurement practices of ZWN members.

Waste diversion measurement was further explored with the question 'What metric do you use to measure waste (please check all that apply)'. Weight was the most commonly used (17 respondents), followed by volume and number (11 respondents each). Other metrics included type and number of reusable coffee cups diverted.

Participants were also asked to elaborate further on what is being measured by their organisations. There was a wide range of responses, but with many commonly occurring answers. Both quantitative and qualitative measures were presented. Table 5.2 presents a representative selection of responses, in the words of the participants, covering each of the four impact types.

Table 5.2: Types of impacts being measured by ZWN members in their own words.

Social	● "Impact stories of behaviour change and championing" ● "Volunteer time, numbers of people using our centre, participating in education/events/workshops, satisfaction" ● "Number of employees, number of participants at zero waste events, number of participants or those being affected by our educational programs"
Cultural	● "Number of education events/workshops provided in te reo, site tours for specific groups e.g.. maori, pacific islanders, permaculture practitioners" ● "Our connections with local groups" ● "Cultural representation within our teams, bicultural relations, inclusiveness, support for all community, availability and accessibility to our teams"
Economic	● "$ into the community through local spend, $ into the community through wages" ● "In-kind contributions, what income is from product sales vs workshops, track project expenses and income for funding providers" ● "Financial performance"
Environmental	● "Trees planted, carbon (just starting on emissions measuring), pests eradicated, transport minimised (diversion of waste from landfill and compaction of recyclables, selling reusables locally)" ● "Pride of place, trees planted, volunteer hours contributed, stories, use of areas" ● "Carbon production of operations - reduced, then offset to 120%"

5.4.3 Impact

Participants were asked about the importance of impact measurement to their organisational strategy. Nineteen participants considered it to be extremely or very important, three thought it somewhat important and two not so important. One participant was unsure as illustrated in Figure 5.4.

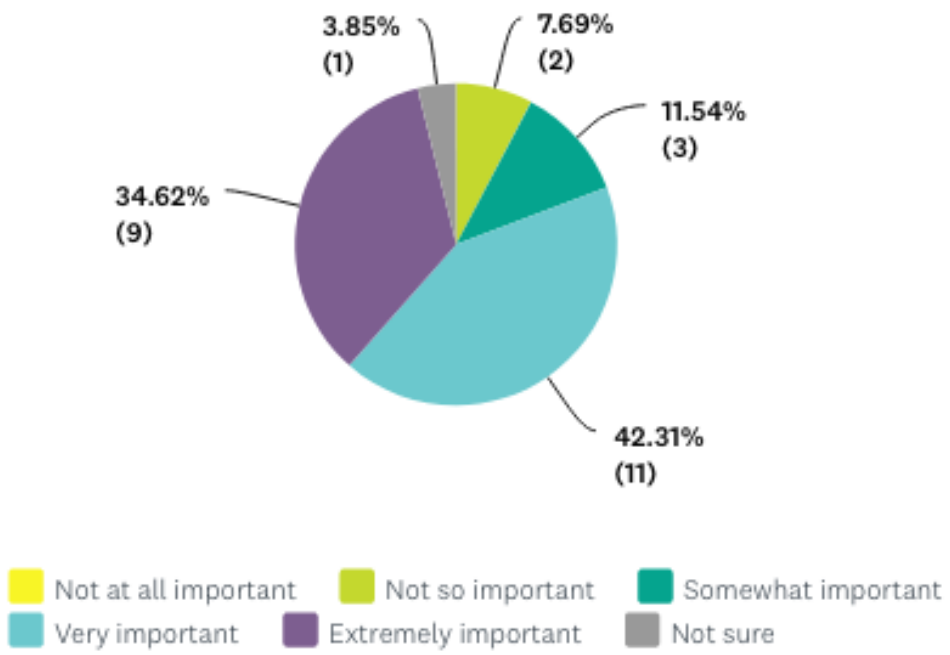


Figure 5.4: Participant rating of the importance of impact measurement to current organisational strategy

As shown in Figure 5.5, of the eight practical design considerations offered for participants to rate, the top three were:

1. Usefulness of telling your impact story to a wide audience (22 participants rated it extremely or very important)
2. Ease of use (23 participants rated it extremely or very important)
3. Usefulness of telling your impact story to a specific audience (22 participants rated it extremely or very important).

Confidentiality of data was the only consideration that any respondents (2 participants) thought was not at all important, while development costs had the second lowest rating.

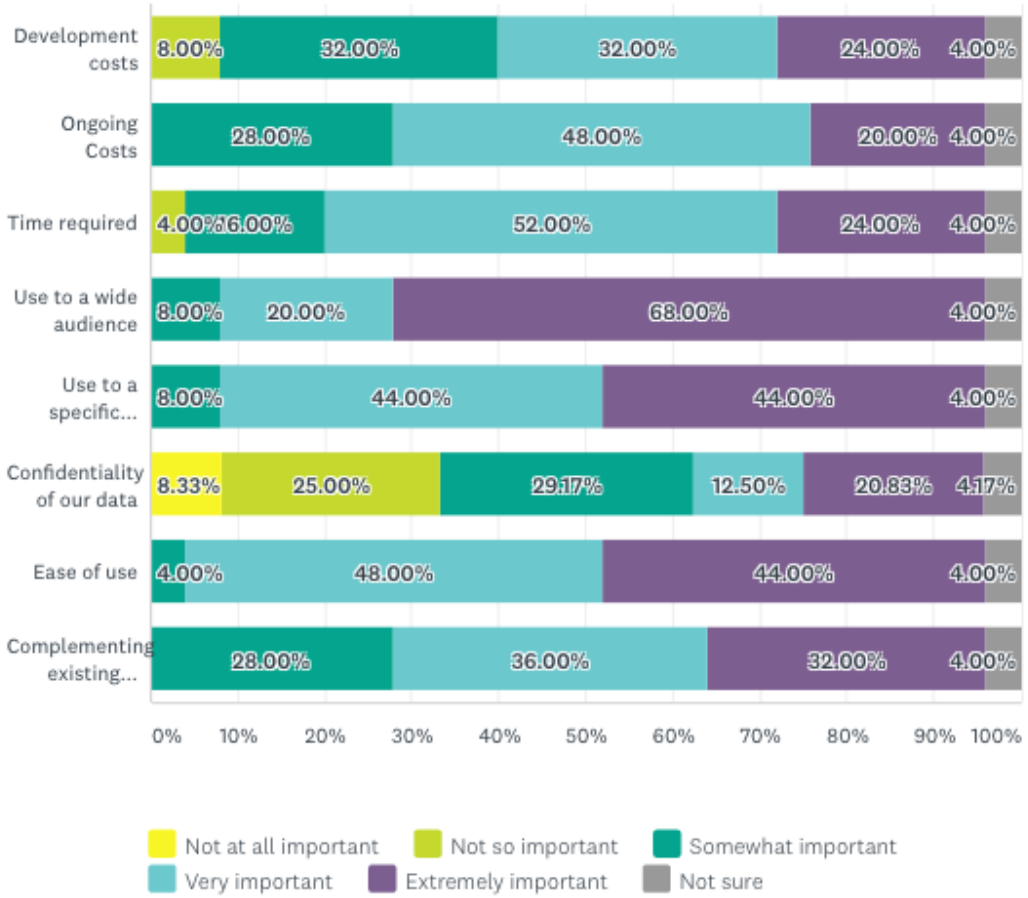


Figure 5.5: Participant rating of the importance of various design features of a shared impact framework

Participants were then asked to provide more detail about the perceived audiences of impact data. Internal audiences (e.g. staff, management and governance teams) were rated as the most important with 21 respondents considering them very important or extremely important. Funders and investors, the public (e.g. the local community) and local government all rated very closely to internal audiences, with central government being the only audience type with a weighted average of under 4/5 as shown in Table 5.3.

Table 5.3: Perception of importance of different audiences of impact data

Audience	Average importance score/5
Internal Audiences (e.g.. staff, management and governance)	4.38
Public (e.g. your local community)	4.36
Funders and investors	4.35
Local government	4.32
Central government	3.68

The survey then asked a range of questions for each impact type: social, economic, cultural and environmental. For each type of impact, a range of measures were offered and participants were asked to indicate how useful they thought each would be for their organisation. The responses to these Likert scale questions were analysed by impact type but also collated into a list (Table 5.4). The highest rated measures across all four impact types were:

1. Waste diversion
2. Return on investment for funders
3. Financial performance + Contribution to local economy
4. The impact of our work on the pro-zero waste identity of employees

Table 5.4: Perceived usefulness of impact measures

Impact measure	Usefulness Score /5
Waste diversion	4.64
Return on investment (e.g.. for Councils or other funders)	4.5
Financial performance (e.g.. turnover or net profit/loss)	4.29
Contribution to the local economy	4.29
To what extent this work impacts on 'pro zero waste' identity of your employees	4.25
Value of in-kind contributions given and received	4.17
Customer/participant engagement (e.g.. satisfaction and reach)	4.13
Employee and volunteer analysis (e.g.. number of employees and volunteers)	4.13
Funding analysis (e.g.. what proportion of revenue was derived from each source)	4.13
Waste hierarchy analysis (e.g.. proportion of time spent on reuse compared to recycling)	4.08
Collaboration (e.g.. in-kind support received and given)	4
Exploring the ways your organisation engages with Te Tiriti o Waitangi	4
Activity analysis (e.g.. Number and type of projects)	3.96
To what extent this work impacts on the identity of your employees as a 'global citizen'	3.95
To what extent this work impacts on the cultural identity of your employees	3.94
Greenhouse gas emission savings	3.92
To what extent this work impacts on your employee's place-based identity	3.8
Trees planted	3.77

Key

Environmental
Economic
Cultural
Social

5.5 Focus groups

The focus groups took place as part of the Strengthening Communities Hui, in October 2019. In total 45 representatives of ZWN member organisations attended the event and took part in the focus groups. There were three focus group topics:

- Establishing conversion factors for reusables
- Reuse categories
- Behaviour change

5.5.1 Establishing conversion factors for reusables

There is currently no standard way of establishing waste diversion rates for reusables. Weight, volume and number are commonly used metrics used across the ZWN. Measuring volume best represents diversion from landfill as it is the use of space, not how heavy things are, that fills up a landfill. However, technology such as weighbridges and scales make it easy to measure weight, and it is the most common requirement for members with council contracts to measure diversion in weight. Weight is also useful for establishing other impacts such as greenhouse gas emissions savings.

Establishing a methodology for being able to convert one metric to another may provide ZWN a flexible and comprehensive way of capturing and communicating a wide range of impacts. This focus group was asked a range of questions about how shared conversion factors may be developed and integrated into ZWN member operations.

Five different organisations were represented in the discussion. Participants discussed the methods of data collection currently undertaken by their organisations. Of these, two collected data on the number of items reused, two collected weight data, and one focused on the volume of the materials diverted. That this range of different methodologies exists even within such a small data set is illustrative of the challenge posed by standardisation.

Within the group, simplicity of future any standardisation process was discussed as being key. From the group's perspective, a wide range of staff need to be able to understand and

use the process. A point was made that staff will tend to go for the 'easy' buttons that cover a wide range of items when using point of sale systems, which will affect the accuracy and detail of data further down in the data analysis process.

In addition to ease of use, a range of other barriers to the development of shared conversion factors were identified and discussed by participants including:

- Costs
- Location - different systems in different places
- Demographics
- Time
- The range of possible categories

Which metric to use (volume, weight or number) was discussed, but no firm position reached. The participants felt that volume is probably the easiest metric, because as goods enter a site, containers are often already utilised for transportation and, in some cases, for measuring the volume of incoming goods. Fruit crates, shopping trolleys and apple crates were all mentioned as examples.

Weighing each item and building average weight data into a till system in order to create a system that collected data automatically, was seen as possible, but the participants recognised it would take a lot of work to set up. There was interest in purchasing an existing list from the Reuse Network UK, who are known to use such a methodology. Another option suggested was by item, as big retail do.

The group considered the audiences of impact data and posed two questions as being fundamental for consideration: "What do funders want?" and "What makes sense for Joe Bloggs?"

Other issues identified by the focus group as being "good to capture and/or consider" included:

- Applicability to all across NZ

- The increasing value of reuse year on year (i.e. the longer you keep things in circulation, the less new things are required)
- The added value of upcycling.
- Different items sell better at different times of the year

5.5.2 Reuse categories

A previous member of the ZWN Board has described the problem faced by the resource recovery sector in a time of mass consumption - if shops like Bunnings have 45,000 different items in stock, then resource recovery enterprises are potentially having to deal with the same number of types of waste. Acknowledging this, the aim of this focus group session was to explore what short list of material types would illustrate both the challenges faced, and the positive impacts the ZWN members have.

The participants in this group acknowledged that while a uniform system would provide a useful tool for individual organisations and being able to collate data on reuse activities would be useful for nationwide collective impact reporting there were significant barriers to this happening. Different councils that our members are contracted to provide work for potentially requiring different systems was highlighted as one example.

A key barrier to standardising reuse categories identified by the group was that changes to data collection systems may affect the operation of the point of sale systems, requiring more time and more training for staff.

The conversation then centred on what waste streams should be considered as reuse categories as part of a shared impact project. Several key conditions were identified: waste streams that are commonly occurring, high volume, high harm and/or pertinent to likely mandatory product stewardships schemes. Specific waste streams categories that are currently used by some members and proposed by the group as being potentially useful in the context of shared measurement were:

1. Construction & Demolition waste (additional categories could be timber and metals) - Reused and recycled
2. Ewaste (additional categories could be small and large items) - Reused and Recycled

3. Clothes - Reused
4. Furniture (additional categories could be small and large items) - Reused and Recycled
5. Whiteware - Reused and Recycled

5.5.3 Education & behaviour change

As with the other focus groups, the conversation began with looking at the value of a shared impact framework to individual member organisations. These ranged from identifying strengths and weaknesses of programmes, being "great as a reflection tool for individuals, as well as the collective", and the potential for providing depth and consistency in information and "repetition in messaging". The concept of benchmarking came up again, with the idea that groups could "utilise competition as a motivator".

Raising the profile of the work being done by the sector, and for attracting investment were both identified as being externally focused reasons for undertaking a shared approach. Other reasons for a shared approach included recognition that sometimes groups "require some external input as a 'starter' to kick things off", and the potential for it to contribute to the development of shared educational resources across the network and the standardisation of national campaigns (e.g. around single use cups).

Barriers to adopting a standardised system expressed included:

- Establishing what the standard system will be and getting agreement to adopt this
- Providing education about the system
- Getting users to engage with and adopt the system
- Keeping it clear and simple

A key point of discussion was about the collective being able to quickly access the shared data for their own use. It was argued that this will need to be considered in the design of any framework. Other aspects of design of a shared impact tool that were discussed included:

- Explaining the 'why" (why do we need to do it)
- Making it do-able, not daunting

- Encouraging starting small (lots doing a little, not a few being perfect)

As discussed in Chapter 3, one of the key points of contention in the literature, is what should be considered as impact. One school of thought is that impact is the longer-term outcomes of activities (e.g. Ebrahim and Rangan, 2014, p.121), another is that impact can include outputs (e.g. Big Lottery Fund, 2015, p.4). Some time was spent discussing this question, and the difficulty in being able to claim attribution for, versus contribution to, a change in people's behaviour.

Experiences with a range of approaches to implementing behaviour change programmes and campaigns were discussed, with some adopting existing frameworks such as community based social marketing.

The groups defined the following as key things about education and engagement activities that would be valuable to consider in the development of a shared impact approach:

- Storytelling: qualitative data was considered as a valid method of impact reporting and particularly important for capturing the impact of education and engagement activities. The 'Most significant change' tool was identified as being of interest for further exploration. Video and image based storytelling were identified as being important, particularly for engagement with local community stakeholders and for use on social media. Impact stories (qualitative accounts of impact) would be useful resources for member organisations. Such examples were seen as having the potential to add the strength to the story of a single member, empowering and inspiring other organisations to undertake similar activities, raise the profile of individual organisations and the CRE sector, as well highlight the importance of work being done in communities.
- Measuring individual campaigns where it is possible to measure (e.g. reduction in single use cups). Waste diversion was considered as being a key way of evaluating success of waste minimisation and behaviour change programmes and establishing a standard way of doing this was seen as a priority.
- Surveying participants/visitors to programmes months after they had the contact to see if there was lasting behaviour change.

5.6 Conclusion

Key findings presented in this chapter offer direction for what a shared impact framework for ZWN members could look like. There was significant interest among ZWN members for a shared approach. A large amount of impact data is already being collected by members across the four aspects of impact and there were some clear areas of agreement on what the areas of focus for any future work should be. In particular, data on reuse and behaviour change were identified as priorities. Further detail was provided for each of the four dimensions of impact, including examples of what members are already measuring and their preferences for what should be included in a shared approach. The next chapter will discuss these findings in the context of the literature reviewed in Chapter 3.

Chapter 6. Discussion

6.1 Introduction

This chapter discusses the findings of the research. It is divided into five main sections. First, Section 6.2 aims to define 'impact' from the perspective of ZWN members. The next three sections focus on addressing three of the four research questions posed in Chapter 1:

- What measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work?
- What are practical and resource considerations that should be taken into account when designing a shared impact methodology for the ZWN?
- Which existing impact measurement tools fulfil the needs of ZWN members?

Finally, Section 6.6 synthesises the learnings from the earlier sections into a framework of action for the shared assessment and reporting of ZWN's impact. This is presented as a table of key activities that could be undertaken in the future. It identifies the party best positioned to undertake each activity, as well as which of the four aspects of impact it relates to.

6.2 Impacts, outcomes and outputs

Before a discussion of potential impact measures, it is important to address a foundational issue: what ZWN members mean when they talk about 'impact'. Defining common terminology is a key component of developing an effective impact measurement framework (McNeill et al., 2017, p.18). As discussed in Chapter 2, impact can be defined broadly as being about change and impression making. This was further explored in Chapter 3, which highlighted that there are multiple ways that the term 'impact' is interpreted and used within mission driven organisations, such as CREs. To revisit this briefly, much of the theory on impact measurement that comes from the evaluation and/or philanthropic sectors use a logic model to describe a journey through inputs, activities, outputs, and outcomes, before finally reaching impacts. In these models, impact is the long term difference that has been made. Several authors acknowledge that at the level of practice, impact often refers to the general

process of measuring and reporting activities, which focus on ‘outputs’ rather than ‘impacts’ (Ní Ógáinet al 2013, p.6; Kramer et al., 2009, p.8; Ebrahim & Rangan, 2014, p.127).

Among the CREs involved in this research, the term ‘impact’ is used in a range of ways. Some of these reference long-term outcomes that are not easily quantified. For example, some survey responses referred to:

- “A Zero Waste community, led by locals”
- “Making communities resourceful, affordable and fun places to live in. Being an alternative to a disposable society”
- “Contributing to the well-being of our community by ensuring we provide a pathway into employment”.

While others focused on more short-term and quantifiable outputs. For example:

- “Number of jobs, Number of people learning something new, Number of customers who found what they were looking for (linked to affordability), $'s in wages, Number of organisations working with, Number of groups sponsored”
- “Tonnage and cubic metre diversion from waste, Number of customers through shop and yard, education and site tour visitors, volunteer hours, have done two customer satisfaction surveys in the 5 years”.
- “Number of jobs, Number of customers (affordability), $ in revenue, $ spent in wages, Number of businesses recycling with us”.

Given the pragmatic approach of this research, oriented towards real world practice, it is important to acknowledge that across ZWN members there are a range of understanding and uses of the concept of impact, and to take this into account in the design of any future approach. Thus, a shared impact framework for ZWN should articulate all parts of the journey towards the long-term change these organisations are working to achieve. Incorporating the measurement and reporting of outputs is one part of this, and developing evidence to support the connection to long-term changes is another.

There may also be a role for ZWN in providing opportunities for ZWN members to build a shared understanding of impact via sharing relevant communications and research and hosting capacity building workshops and other educational events.

6.3 CRE perceptions of importance

This section answers the research question: what measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work? Participants were explicitly asked for their opinions on the usefulness of a range of tools within the survey. Their responses were summarised in Table 5.4 in Chapter 5. These results are discussed below in terms of environmental, social, cultural and economic impacts.

6.3.1 Environmental impacts

Unsurprisingly for members of a zero waste focused organisation, waste diversion was identified by participants as being the most useful measure of their impact. Every member that participated in the survey identified diverting waste from landfill as a goal of their organisation, and just three participating organisations were not already measuring waste diversion when surveyed. Waste diversion was also the key environmental impact discussed during the interviews with external stakeholders. Waste diversion is consistently discussed as an impact of CREs in similar research conducted internationally, as highlighted in Table 6.1.

Table 6.1. Types of data collected in four studies of CREs

Furniture Reuse Network Membership survey Reuse Network, 2017	**Review of the Voluntary and Community Waste Sector in England** Williams, Croker & Barrett, 2005	**A baseline study of Australia's community recycling enterprises.** Yousefpour, Barraket & Furneaux, 2012	**COMMUNITY RECYCLING ENTERPRISES - NSW Impact Measurement Project.** McNeill, Barraket & Elmes, 2017
General Information Contact details Geographic Activities and Impact Objectives Client groups Diversion information Type Number Supply and Partners Placements and People Finance and Resources Finance Human resources Transport Premises Organisational Structure	General Information Geographic Length of operation Organisational Structure Placements and People Activities Diversion information Volume Type Source Objectives Network Organisations Income and funding sources Barriers and forward planning	General information Geographic Length of operation Activities Objectives Organisational structure Diversion information Income and funding sources Barriers	General information Geographic Length of operation Organisational Structure Activities Objectives Placements and People Diversion information Volume Type Source

Reuse activities are also a priority for CRE impact reporting. The need to focus on reuse data over recycling data was expressed in the interviewees and aligns with the survey results that showed the primary activity of those surveyed is reuse, followed by zero waste education, with recycling coming in third. There is a gap in national focus around reduction and reuse activities as illustrated by two significant projects - the development of a national waste data framework and the Ngā Tūtohu Aotearoa project. Neither zero waste education or reuse were recommended as being part of the national waste data framework, which was focused on recycling and waste to landfill data (Eunomia, 2015, p.11). Statistics New Zealand's Ngā Tūtohu Aotearoa project (2020) includes an indicator for material intensity which the Tūtohu Aotearoa website (2020) states will "include recycling, landfill inflows and the second-hand economy, and will aim to measure what materials we, as a country, use to produce things, what materials are left over from production, and what we do with the leftover materials (such as recycling them, sending them to landfills, or reusing them)". However, this indicator

is still to be developed. This gap in both the current data set and the plans for future work, can be considered as an opportunity for ZWN's network of CREs. Members are both active and interested in this space, as the survey and focus group results attest to. It may be that the development of a shared approach to measuring reuse in particular, but also zero waste education and reduction activities, could have wider use than just for the network, as it would be one of the more significant pieces of work undertaken on this topic in Aotearoa New Zealand.

As discussed in Chapter 3, waste diversion can be measured in a number of ways (by weight, volume, number or type). The survey found that each of these methodologies are used by at least one ZWN member. Weight was the most commonly used, followed by volume and number. In order to collectively report on waste diversion there are two possible pathways: 1) agree to standardise the method of measurement (e.g. all ZWN members agree to measure and report the weight of the waste diverted); or 2) agree on conversion factors that allow measurement in one methodology to be expressed as another. ZWN Sydney used the first approach during their pilot project, getting groups to weigh donated items and estimate the volume of material type in each load (Allen, 2019, p.5). The Reuse Impact Calculator developed by Fortuna & Castaldi (2018, p.1199) used the second process, allowing users to input a single item type, leaving the calculator to automatically define up to three material types, based on predetermined material characteristics. Some work has already been done in New Zealand to define conversion factors for recycled materials (Colquhoun and Snow, 1995, p.12) and a small regionally-based collective of ZWN members are using this as the basis for their monthly reporting (Luxon, personal communication March 30, 2020).

GHG savings from waste diversion was an impact identified by one of the interviewees as being highly relevant as councils and government agencies prioritise climate change action. 78% of survey participants identified measuring this impact as being extremely useful (32%) or very useful (44%). As discussed in Chapter 3, GHG emission savings are reported on by a number of CREs around the world and have featured in a number of research papers concerned with the impact of CREs. The motivation for the development of Fortuna & Diyamandoglu's (2013, p.15) product characterisation methodology was to develop a "robust estimation procedure of greenhouse gas (GHG) emissions that would enable reuse organizations or interested parties to carry out such computations with ease". Given the

complexity of calculating GHG emissions for a variety of materials and across a range of different waste activities (e.g. landfilling, recycling, reuse and reduction), the development of a standard set of emissions factors for use by CREs may be best done outside of the network. There is a potential role for ZWN in advocating for this work to be done by the team within MfE who currently are responsible for developing the emission factors for reporting undertaken by businesses in Aotearoa New Zealand. Further academic research may be another possible pathway towards robust and relevant base data.

6.3.2 Economic impacts

The survey results indicated that ZWN members consider economic impacts as highly relevant to a shared impact framework. Five of the ten highest ratings of usefulness were economic indicators (see Table 5.4 in Chapter 5). Of these, return on investment was given the highest rating. Expressing impacts in financial terms via SROI processes and multiplier effects can be an involved process, with significant resource requirements, and limited use within the context of a shared approach to impact measurement. SROI is most often used by a single organisation, rather than in the context of shared impact, and there is limited literature on how the two may be combined. Social Value UK (2018, p.4) suggests that SROI processes can be useful in helping an organisation to determine what other actors may need to be involved in a collective impact process, but argue that SROI is best suited to measuring the impact of an individual project, rather than a collective impact project.

In regards to multiplier effects, the calculation process is a highly technical one, which requires a familiarity with macroeconomic theory and matrix algebra (Vernon & George, 2001, p.10). Within Aotearoa New Zealand, a lack of publicly available data on the waste sector regionally as well as outdated input-output tables (Statistics NZ, 2013) limit the ability of a multiplier approach being applied to CREs producing accurate estimates. One option would be to hire an economic consultancy to undertake data collection efforts and perform the necessary analyses, as per the Price Waterhouse Cooper analysis of the NZ music industry (PWC, 2018).

6.3.3 Cultural impacts

A key conversation over the course of this research has been around how the work of CREs contribute to shifting the mindset around resource use towards zero waste values. This was

explored in the survey in questions around cultural identity, and in the focus groups discussions around behaviour change.

Survey participants identified an exploration of pro-zero waste identity among CRE employees, as the most useful measure of cultural impact, and the use of a simple Likert scale survey question was asked of ZWN employees and presented to ZWN members as part of the development of an example impact dashboard. The literature explored in Section 3.3.4 discussed the role of organisational narratives in informing identity within organisations. The mission analysis discussed in Section 5.4.1 suggests that waste diversion is a key concept ZWN members use as part of their public organisational narratives. Several ZWN members questioned whether an exploration of pro-zero waste identity development may also be relevant for the customers and supporters of CREs, in addition to employees. Further research into the development of a pro-zero waste identity is needed.

In overseas research, CRE interactions with their wider community, and in particular, with other community groups, has been considered to be either in the realm of cultural impacts (e.g. Yousefpour et al., 2012, p.31) or social impacts (e.g. McNeill, Barraket & Elmes, 2017, p.15) - an example of the often blurred line between these two aspects (Pizzirani et al., 2014, p.1324). This research has taken the position that these interactions form part of placed-based aspects of cultural impacts. Simple survey questions on the type and number of interactions with a CREs local community could be integrated with relative ease into a shared impact framework. Collecting data on the number of groups CREs work and/or interact with would give a simple indicator of reach. Stakeholder analysis and mapping would be another option for gathering more specific data on the players and interactions that happen in a community. Stakeholder analysis involves identifying, investigating and categorising stakeholders to understand the relationship stakeholders have to each other and other elements such as influence (Bernstein, Weiss and Curry, 2020, pg.2). Stakeholder mapping is a visual representation of this analysis.

Engagement with Te Tiriti was another widely discussed topic during the research. It was rated as a useful measure by survey participants, however it appears it is largely aspirational with very few members currently measuring or reporting on it. Possible future action regarding this point is discussed in Section 6.5.5.

6.3.4 Social impacts

Education and behaviour change impacts were identified within the literature, interviews and survey as a key aspect of the CRE model. The brief summary of behaviour change literature in Section 3.3.3.4 presented a complex picture of interacting processes that lead to the adoption of pro-environmental behaviours, as well as a number of potential theories and frameworks that can form the basis of a behaviour change intervention. The focus groups confirmed that there are a range of models used among ZWN members. This suggests the first step to developing a shared approach may be establishing what key commonalities and differences exist in the different approaches taken by ZWN members. Given that Darnton (2008, pg. 23) proposes that common best practice in the design of behaviour change interventions is to develop a bespoke approach that takes into account audiences and influencing factors specific to a situation and context, it may not be possible to develop a suitable collective approach.

Four types of social impacts were identified as useful by survey participants: customer/participant engagement, employee and volunteer impacts, collaboration and outputs relating to activities undertaken.

Customer and participant engagement was identified as useful by survey participants and was further discussed in the focus groups. Using both quantitative and qualitative data to explore this issue was identified as important by research participants. Reach is a relatively common and easy indicator to measure - many ZWN members already count the number of customers via numbers of transactions, as well as the number of people attending workshops and events. In addition to these output measures, participants in the focus groups discussed developing processes for capturing longer-term behaviour changes. A tool that produces qualitative data, such as the Most Significant Change tool, introduced in Section 3.4.1, may be a good option for producing data about behaviour change occurring within an individual CRE, while at the same time providing useful data for the shared impact project. Standardised customer satisfaction research, such as through the use of surveys, may offer another possible pathway to producing standardised quantitative data.

As Table 5.4 showed, collecting data on the employee and volunteer numbers was another output rated as useful by survey participants. Once again, this data is commonly collected and reported on, as evidenced by the ease with which ZWN was able to produce the statistics outlined in Chapter 2. Similar to data about customer and participant engagement, data about the creation of meaningful work via employment and volunteering opportunities could be explored using qualitative tools.

6.4 Practical and resource considerations

This research project is one part of a wider project, intended to inform future action. Inspiring Impact, a UK based programme working on impact for charities and social enterprises suggests the process of developing shared impact has the following stages:

1. Understanding your sector
2. Developing shared outcomes
3. Using common tools
4. Using common methods
5. Sharing and comparing results (Ní Ógáin et al., 2013 p.8).

This research aims to contribute to parts 1 & 2 of this process, while stages 3-5 are more focused on implementation. This section explores the key factors that need to be considered going into the implementation phase. Survey participants were asked directly about this, and this topic also featured in both the interviews and the focus group discussions. Three key considerations were identified: audience, ease of use and timing.

6.4.1 Audiences

Audiences for impact reporting are identified as a key consideration. McNeill et al. (2017, p.18) suggest a strategic approach to impact measurement involves careful consideration of who the audience is, and what level of fidelity will satisfy their information needs. Understanding who is going to be engaging with impact information, and what their drivers for doing so are, is key for providing the right kind of information.

Four key audiences for CRE impact reporting are discussed below, with a short exploration of the main driver for an interest in impact information and reporting. These key audiences and drivers are visualised in Figure 6.1 below.

Figure 6.1: Key audiences and drivers for impact measurement in CREs

Internal Audiences: Internal audiences include all staff and volunteers. Creating support and buy-in for projects and other organisational activities is important, as these people are, at a minimum representatives of the organisation, and at best, champions for the cause. Focus group participants discussed using shared impact reporting (specifically, benchmarking) as a way to motivate teams. Managers and those responsible for strategic direction setting such as governance committees and trustees also need specific impact information in order to make important planning decisions, including budgets and other resource allocation activities, and evaluation and improvement of organisational activities and services.

Community stakeholders: Key community stakeholders include the clients, users of a service and customers of CREs. More generally, representatives of the local communities in which CREs operate are a common audience for impact reporting. The main driver here is about increasing engagement through the communication of good stories and explanation of how the organisation/service/project works (Lakhotia, 2017, p.2-3). As discussed in Section 2.2.1, culture and mindset change is a key underlying activity of CREs. The focus groups highlighted that ZWN members consider building support and buy-in for these community-scale shifts in attitudes and behaviours is a key reason for focusing on communicating impacts to their community stakeholders.

Policy makers: Zaman (2013, p.683) identifies policy-makers and other decision-makers as a key audience for waste data to aid the evaluation, analysis, and development of new systems and services. Within the Australian context, McNeill et al (2017 p.21) identified state environment protection agencies and councils as important stakeholders for CREs, who provide services under contract to these agencies. The same is true in Aotearoa New Zealand, with Councils being important funders and partners of CREs, including via contract for service relationships. Under the Waste Minimisation Act 2008, territorial authorities are required to prepare Waste Management & Minimisation plans and undertake waste assessments every six years. This is an important opportunity for CREs to influence objectives and policies, and impact data would be useful in this process.

At the central government level, a number of government agencies are responsible for policies that affect CREs. In particular, MfE, the Government's principal advisor on environmental issues and the administrator for the Waste Minimisation Fund, has an important role in defining priorities for the sector, and in investment. Communicating to MfE collective CRE impact, as well as information about how best to enable impact data to be measured and reported could have important implications for the policy environment in which CREs operate. Robust impact data is likely to help individual CREs to access investment, including from the Waste Minimisation Fund.

Funders: Philanthropy is a major source of funding for community enterprises, and funders want to know that their investment is achieving the things they want it to. As discussed in Chapter 3, the influence of the philanthropic sector can be seen in how impact measurement is conceived of and undertaken at a community level (Ebrahim and Rangan, 2014, p.130) and the focus on impact as long-term change has largely been driven by this sector. All funders, including government agencies, local government and philanthropic organisations are important audiences for external reporting, and many have very specific reporting requirements that must be agreed to as part of receiving funding.

In regards to a shared impact framework for ZWN, it is likely that different aspects of the framework will be of greater interest to different audiences. Both interviewees felt that policy makers and councils may see much more value in quantitative data, whereas the qualitative stories of change were identified in the focus groups as being important for building support,

custom and buy-in for community-scale shifts in behaviour within the communities CREs operate in. Internal audiences, community stakeholders, funders and investors and local government audiences were all rated over 4/5 for importance in the survey.

From this perspective it may be preferable to focus on developing shared approaches to impact reporting for different audiences at different points, rather than waiting to have all parts ready before beginning implementation. McNiell et al (2017, p.18) proposed a 'rapid prototyping' approach as being well suited to the CRE context, where there are substantial time and other resource barriers to engaging in data recording and reporting. A staged approach would allow for the integration of learnings of users as they become familiar with the framework, and begin to understand more fully the benefits of data management activities.

Beginning by producing information for internal audiences - including board members responsible for organisational direction setting, project managers and staff generally - would provide information that would be able to be directly integrated into organisational decision making. It would also provide the opportunity to trial and develop strong methods and communications around the impact measurement and reporting that could then be refined and used in impact reporting for external audiences.

6.4.2 Ease of use

How easy it is to contribute data and use it to undertake shared reporting was another key consideration identified during all data collection phases. By first examining barriers and challenges, and then exploring how these can be mitigated or reduced, this section aims to establish some key actions to ensure a shared impact framework is easy to use.

McNeill et al (2017 p.32) identified four key challenges for CREs in improving impact reporting:

1. Capacity to allocate resources, especially time
2. Access to appropriate processes and systems
3. Openness to adapting practices
4. Willingness to closely cooperate with others in the network.

These were echoed in the focus groups with the addition of two further challenges:

5. Establishing what the standard system will be, and getting wide getting agreement to adopt this
6. Keeping it clear and simple

Resources are required for the implementation of new systems. Piloting new tools with a smaller group would reduce the impact on the network overall. Trying to incorporate new reporting tools and methodologies into existing reporting activities may be another way to reduce the time needed. For example, the current annual return process for registered charities in Aotearoa New Zealand requires the completion of a performance report. Templates for a statement of service provision have been developed by Charities Services. Discussions with this agency suggest that adapting these existing templates to include reporting on additional outputs and outcomes would be acceptable, and that the current templates are a good guide for the minimum reporting requirements. Once agreement is reached within the membership about the shared outputs and outcomes, ZWN could develop a Statement of Service Provision template, making this available to ZWN members and even the wider CRE sector, and regularly updating this as additional measures are developed and agreed. This approach would have value for the individual CREs, and if it was in a format that could be easily shared with ZWN the collective data would be easy to collate.

Time for training staff to use new systems is another key issue, and it would be good to have clear information on likely training requirements available for every group that chooses to become involved in the shared impact project. In order to be able to provide relevant information about how long it takes for new systems to be integrated into an operation, a pilot study may be needed. The development of guidelines and having a person employed by ZWN to support members with training and ongoing issues are other possibilities for reducing staff training time.

Access to appropriate processes and systems is not just about establishing what those systems and processes are (which is the goal of this research) but also ensuring that the final framework works across the full range of facilities in which CREs are based. It needs to

consider the very real limitations some CREs currently face - for example, some sites do not have electricity, and/or computerised point of sale technology - as well as keeping costs low. Limiting the materials and products to be included in the framework is one way of reducing the burden on groups to keep detailed data. Another possibility is including an option for reporting on categories at a meta level – e.g. total reusables diverted, rather than individual product or material categories.

6.4.3 Timing

The issue of timing is particularly important in respect to any reporting of collective impact - the fifth and final stage in the Inspiring Impact's model: Sharing and comparing results (Ní Ógáin et al., 2013, p.8). Individual CREs using tools and templates that sit within the shared impact framework could occur at any point if these were made open source or at least freely available via a request to ZWN staff. However, in order for collective reporting to occur, some set timeframes would need to be established. In particular, it would be necessary to set cut off dates for data coming in from eligible CREs to be included, to enable sharing of the results back to members and the wider public. Given a staged approach to the implementation is likely, this may not be a concern for some time. Getting the tools and methodologies established and working for individual CREs should be the first priority. However, collective data will be of significant value for ZWN's work to advocate for the zero waste model and CREs generally, as well as to individual CREs who could use it to illustrate the work they are doing is part of a larger story of positive change. As such, it is useful to consider the timing considerations.

In the context of CREs trying to establish a sensible timeline, existing reporting requirements are once again an important factor. Annual reporting is so common among CREs, that it is an obvious approach to use as the basis for a shared approach. As discussed above in Section 6.4.2, leveraging the New Zealand governments reporting standards that require all non-profits undertake an annual return by aligning the shared impact reporting to this process would minimise additional work for CREs. Currently, all registered non-profits are required to submit an annual return within 6 months of their financial year end or balance date (Charity Services, 2020). Amongst the CREs surveyed there is no common balance date, with an even split between March and June, and two December balance dates.

This lack of a common balance date means that the process of collecting, collating and reporting the shared data may have to take longer than it would for an individual organisation. An example timeline is provided in Figure 6.2 below to illustrate how the timing aspect could look, and the significant delay for those organisations with a December balance date to have access to the shared impact data. The main benefit of an approach that respects existing balance is the shared data could be sourced directly from existing reporting activities, meaning less additional work for individual CREs.

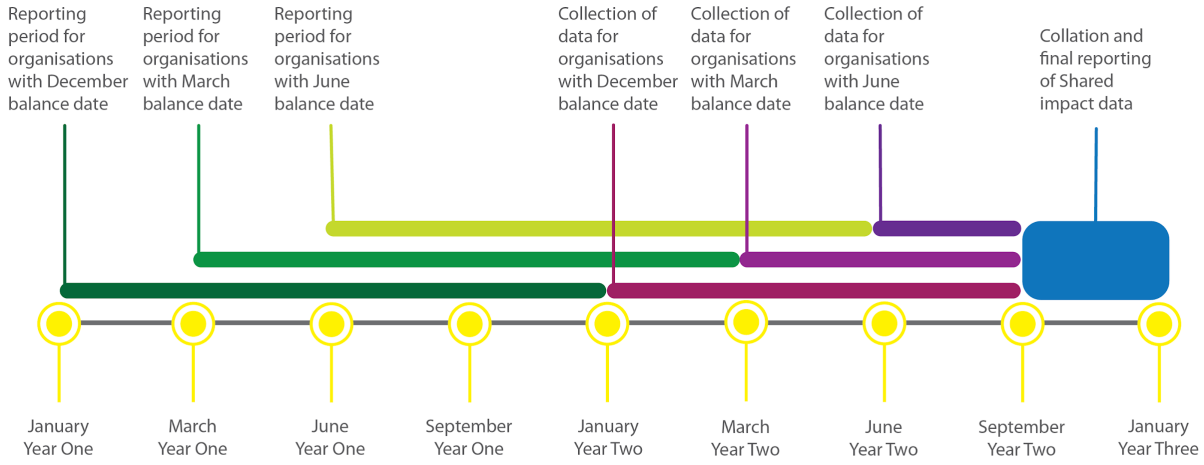


Figure 6.2: Example of how shared reporting could occur across different balance dates

6.5 Appropriateness of existing tools

Considering the priorities and interests of ZWN members and the other stakeholders involved in this research, there are several tools and methodologies explored in the literature review which are worth considering for inclusion in a shared impact framework for CREs. These include carbon metrics, employment intensity, most significant story, reuse metrics, tools for engaging with Ti Tiriti o Waitangi, client/user outcomes, local spend and in-kind contributions and a waste hierarchy analysis, each of which are discussed below.

6.5.1 Carbon metrics

Several tools have been developed in other countries that calculate the carbon implications of different waste management options. The methodologies behind these tools may be suitable for use in Aotearoa New Zealand, but the data used to complete the calculations on impact will not take into account Aotearoa New Zealand's geographical position (i.e. a long way

from international markets, requiring significant freight). Nor is our reliance on overseas markets for the reprocessing of many recyclable materials likely to be the same as larger economies with more reprocessing infrastructure and different waste disposal options (e.g. incineration). These two factors are important for working out the relative impacts of diversion and using tools developed for an overseas context will not provide an accurate picture of the emissions impacts of the zero waste model here. Given the lack of information about plastics in the current MfE emissions guides, and the fact that it calculates emissions savings at the level of materials, not products, it may be that ZWN members could agree to use a carbon metric from overseas. Contacting the UK's Reuse Network, Spain's Asociación Española de Recuperadores de Economía Social y Solidaria and the developers of New York's reuse metric to ascertain whether these organisations might be amenable to sharing their methodologies is a possible action for ZWN.

There is also a role for ZWN in advocating for plastics to be added to the MfE guide, or for the development of a better fit tool. Feeding this feedback to the Indicators Aotearoa project team at Statistics New Zealand may be a valuable exercise as a methodology to calculate the GHG savings of reusables would have utility for the entire secondhand goods sector. ZWN commissioning such a piece of work may be another option, and the development of a brief and research into the potential resource implications may be a useful next step.

6.5.2 Employment intensity

At the level of a single CREs, employees often number in the single digits. Taken alone, that data is unlikely to make a convincing case for the value of the adoption of the CRE model. However, the collective number tells a different story. The most recent survey of ZWN puts the total number of employees at over 700 (ZWNc, 2020, p.2). It would be valuable to have this figure regularly updated, especially in light of a number of current and proposed initiatives, with significant job creation potential, such as Auckland's Resource Recovery Network, and a nationwide container deposit system (Snow, 2015, p.9). An annual count of employees is something that ZWN could undertake with existing resources. The power of this simple indicator could be strengthened by research that compares the number of jobs created by the different waste management strategies. Overseas research comparing reuse to recycling, landfilling and incineration provides evidence of the job creation potential of zero waste activities (ZWN Sydney, 2019; Access Economics, 2009; Institute for Local Self

Reliance, 1997; US EPA, 2002). However, much of this research is dated and none of it is from Aotearoa New Zealand. Undertaking or commissioning similar research for Aotearoa New Zealand would provide individual CREs and the sector as a whole an important piece of the impact story, especially in a challenging post-covid economy.

6.5.3 Most significant change

Through the systematic collection of anecdotes, this methodology has significant potential for collecting evidence of change that may be missed by conventional monitoring techniques (Wilder and Walpole, 2008, p.530). There are many aspects of the impact of the CRE model that could benefit from this focus on identifying significant changes, including: the development of pro-zero waste identity of staff and community stakeholders, contribution to the local economy and collaboration between CREs and other community stakeholders.

6.5.4 Reuse metrics

Several tools that measure the impact of reuse activities have been developed overseas. These are extremely relevant for this project and represent models that could be closely followed, or possibly even tools that could be employed with minimal change to the methodology required. Thus, the required action here is to first establish whether any of the creators of reuse metrics would be interested in letting ZWN use their tools, and to establish any conditions associated with that transaction. If purchase is an option, ZWN would need to find the resource to do this. There are several benefits associated with using an existing tool, such as reduced development costs and a proven track record, however there are still some risks that would need to be assessed. In particular, it would be important to be able to change the background data relating to things like emissions factors to ensure the tool was providing data that was relevant to Aotearoa New Zealand rather than its country of origin.

6.5.5 Tools for engaging with Te Tiriti

Although there are a number of Māori conceptual models and assessment tools such as the Mauri Model that could be valuable for the network to explore, discussions with members and a Māori Studies academic from Massey University, as well as findings in the literature suggest that standardising a network-wide approach as a first step may not be the appropriate approach.

It is important to acknowledge that Māori are a heterogeneous population with varied values, perspectives, experiences, local mātauranga and whakapapa (Te Puni Kōkiri and the Treasury, 2019, p.10). The importance of the local community to CREs was identified in the survey results, and particularly via an analysis of the mission statements of ZWN members. Taking this as a starting point, encouraging ZWN members to engage with mana whenua locally would allow for place-based cultural impacts to be developed and strengthened in a way that puts relationships first and maintains the integrity of mātauranga Māori. Although a standardised approach is not yet recommended, posing the question "how are we supporting mana whenua aspirations?" in discussions around shared impact, would encourage this topic to be a focus of ZWN members and provide some direction for action to be taken by individual CREs. The Treaty Resource Centre has developed *Ngā Rerenga o Te Tiriti*, a resource specifically for community organisations to engage with Te tiriti o Waitangi. It includes a number of key considerations and preparatory steps:

- Understand your organisation's drivers for engaging with Te Tiriti
- Develop a clear understanding of how the Treaty fits with your organisation's values and work.
- Develop a clear and shared understanding of what the Treaty means to you (e.g. if you reference treaty principles, which version of Te Tiriti/the Treaty are you referring to) (The Treaty Resource Centre, 2016, p.7).

ZWN support for education and capacity building opportunities in this space via Treaty workshops is one way that ZWN could encourage a sector-wide shift towards honouring the treaty, and promoting positive cultural impacts. ZWN should begin this process itself and lead by example. Article One of *Te Tiriti* places responsibility on the government for protecting, promoting and working in partnership with Māori. If ZWN takes its role as sector leader seriously, ensuring a Māori perspective is protected and promoted and that meaningful relationships are developed between mana whenua and the CRE sector, is important.

6.5.6 Client/user outcomes

Survey participants rated these highly as a useful indicator of their social impacts. Simple survey tools are widely used for the measurement of customer satisfaction, including among ZWN members. A template for a standardised customer satisfaction survey could be

developed and distributed to ZWN members for use. This could explore client/user experience, as well as the development of pro-zero waste identity within clients, as an indicator of cultural impacts.

6.5.7 Local spend and in-kind contributions

When asked what kind of economic impacts they currently measure, several survey respondents referenced local spend, and the local impact of wages, for example:

- "$ into the community through local spend $ into the community through wages".
- "$$ back into community from local wages, shopping local and using local service providers, income broken down into sources".
- "In kind contributions, what income is from product sales vs workshops, track project expenses and income for funding providers".

With these examples as a reference, it would be relatively easy to develop a standardised methodology for collecting and reporting outputs and outcomes around local spend and the value of in-kind contributions given and received. As a first step, CREs agreeing to reporting the amount spent on wages and/or local businesses would provide a simple indicator of local spend. This could be compared to the amount of funding received - an example statement might be: "We received $200,000 of funding, and turned this into $500,000 of economic activity in the local community".

After considering the complexity of multiplier analysis, a detailed case study exploration of the local economic impacts of one (or several) individual CREs seems more achievable than analysis and reporting of collective impact. Robust case study material would be valuable to use as reference material in conjunction with the simpler indicators discussed above.

6.5.8 Waste hierarchy analysis

Although no tool for undertaking waste hierarchy analysis was found, a methodology was trialled by ZWN as part of the research and found to be effective and relatively easy to implement and report. The following question could be included in the shared impact framework:

How many full-time equivalent roles in your organisation are dedicated to:

A. Reduction?
B. Reuse?
C. Recycling?
D. Disposal?
E. Other?

6.6 A framework for future action

Collectively, the tools and methodologies presented in the previous section, could provide a comprehensive picture of the impact created by CREs. Table 6.2 develops these further into a framework for future action. The aim of this research is to understand what an appropriate and effective approach to assessing the shared impact of the Zero Waste Network could look like. Section 6.5 identified the tools that have emerged from this research. Table 6.2 below presents these as a framework for future action. It consists of three main sections relating to three types of future activity:

The first section (coloured green) is a series of agreements to be made by the collective ZWN members, or agreed representatives of ZWN members. The aim of these is to facilitate initial measuring and reporting to a shared set of indicators and using the same methodologies. The development of agreement on these three things is needed to progress collective reporting and are focused on the standardisation of data collection and processes.

The second section (coloured blue) relates to the development of a suite of reporting tools that could be developed as part of a shared impact framework. These cover a range of metrics across the four impact dimensions. One of these is a template for service provision, which collates many of the other suggested tools into a single place.

The third section (coloured yellow) is about increasing the evidence base at the ZWN level. The goal of this set of activities is to start to build up a range of resources and relationships that can be used to support the case that the shared outputs and outcomes that the members are measuring and reporting on.

The table also indicates the level and domain of impact that the activity supports. Importantly, it also outlines the next steps for each suggested process or tool. The framework will form the basis of a recommendation to the ZWN Board, and inform the next stages of the ongoing shared impact project.

Table 6.2: Framework for future action towards the development of a shared approach to impact measurement for ZWN

What		**Next steps**	**Level of impact**	**Who**
Member agreement required	Agree material categories for data collection	Decision-making panel to be established, representing ZWN members Decision-making process to be agreed. Decision to be made on categories. Categories could include: ● Plastics (Recycling) ● Paper (Recycling) ● Cardboard (Recycling) ● Timber (Reuse) ● Metal (Recycling and reuse) ● Ewaste (Recycling and reuse) ● Textiles (Reuse) ● Whiteware (Recycling and reuse) ● Organics (Composting)	Outputs, outcomes (waste diversion)	ZWN members

	Agree standardised conversion factors for waste diversion (weight/volume/number) for key materials/products	Decision-making panel to be established, representing ZWN members and stakeholders Decision-making process to be agreed. Could include data collection processes and/or verification processes Decision to be made on conversion factors	Outputs, outcomes (waste diversion)	ZWN members
	Agree standardised average material composition for key products list	Decision-making panel to be established, representing ZWN members and stakeholders Decision-making process to be agreed. Could include data collection processes and/or verification processes. Decision to be made on standardised average material composition list	Outputs, outcomes (waste diversion)	ZWN members
Tools for future development	Most Significant Change process	ZWN to instigate a Most Significant Change process with ZWN members. ZWN staff to undertake facilitator training and/or find external facilitators to lead the process.	Outcomes across multiple dimensions of impact (To be decided on as part of the MSC process)	ZWN, ZWN members

		Find representatives willing to be involved in the selection of domains and stories. Undertake initial MSC change process, including a review of utility for the purposes of shared impact reporting with the aim of a decision on its future use Suggested key domains for consideration: ● Staff and stakeholder pro-zero waste identity and behaviour change ● Creation of meaningful work ● Collaboration ● Support of mana whenua aspirations		
	Carbon metric	ZWN to approach MfE and Statistics NZ to discuss development of a GHG emissions calculator suitable for data on reusables. This should include a discussion about the current absence of plastics in MfE's GHG emission guidelines. ZWN to establish a workbook for conversion of waste diversion data for key products/materials, using data	Outputs, outcomes, impacts (GHG emissions/climate change)	ZWN, Ministry for the Environment, Statistics NZ

		from MfE and/or overseas. The workbook could include the following materials and end-uses: ● Plastics (Recycling) ● Paper (Recycling) ● Cardboard (Recycling) ● Timber (Recycling and Reuse) ● Metal (Recycling and reuse) ● Ewaste (Recycling and reuse) ● Textiles (Reuse) ● Whiteware (Recycling and reuse) ● Organics (Composting)		
	Reuse metric developed	ZWN to contact creators of overseas reuse metric tools. Decisions to use existing tools or develop our own to be made. Final reuse metric to include calculations for: ● Reusable timber ● Scrap metal	Outputs, outcomes, impacts (waste diversion)	ZWN, Overseas developers of reuse metrics

		• Ewaste • Textiles • Whiteware		
	Develop short standardised surveys for staff and volunteers for use by ZWN members	ZWN to develop and distribute a survey to ZWN members.	Outputs, outcomes (development of pro-zero waste identity and behaviour change)	ZWN, ZWN members
	Develop short standardised customer satisfaction survey for use by ZWN members	ZWN to develop and distribute a survey to ZWN members	Outcomes (attitudes and behaviour change)	ZWN, ZWN members
	Calculation of amount spent on wages and local contractors as indicator of local spend	ZWN to develop and distribute a simple guidance on calculating CRE local spend (i.e. wages & custom with local businesses).	Outputs, outcomes (local economic development)	ZWN, ZWN members
	Waste hierarchy analysis	Analysis of current ZWN member employment data to be undertaken, focused on the number of FTEs across each waste hierarchy activity (i.e Reduction, Reuse, Recycling and disposal).	Outcomes, impact (waste diversion)	ZWN, ZWN members

		This analysis could also include the number of volunteer FTEs associated with each activity.		
	Behaviour change	Further research undertaken to explore common frameworks and approaches.	Outcomes (waste reduction, behaviour change towards zero waste)	ZWN, ZWN members
	Develop template statement of service provision	Could include: ● Waste diversion ● Waste hierarchy analysis ● GHG emission savings (with worksheet) ● Annual turnover ● Local spend via wages & custom with local businesses ● Support of mana whenua aspirations ● Customer & participant engagement outputs based on the results of the standardised survey ● Employee & volunteer outputs based on the results of the standardised survey	Output, outcomes, impacts across all four dimensions of impact	ZWN, ZWN members
ZWN Background	Distribute research for discussion	Researcher to make final thesis and summary documents available to ZWN staff, Board and	Output, outcomes, impacts across all	Researcher, ZWN members

work		members. Findings presented and discussed at ZWN networking calls and events.	four dimensions of impact	
	Commitment to Shared impact project via personnel and budget allocation	Proposal for next stage of the project developed and put forward to the ZWN board for decision.	Output, outcomes, impacts across all four dimensions of impact	ZWN
	Capacity building for ZWN members - building a common understanding on 'impact', developing organisational theories of change	Networking calls and events held on the topic of impact. Could include presentations from the researcher, case studies from members and external stakeholders.	Output, outcomes, impacts across all four dimensions of impact	ZWN, ZWN members
	Engaging with Te Tiriti - leading by example, documenting the process	ZWN Board to prioritise Te Tiriti learning. ZWN to communicate the learning journey to members via communications, networking calls and workshops.	Output, outcomes, impacts (Cultural impacts)	ZWN

	Commission research on employment intensity	Further research commissioned/undertaken to explore this in the context of Aotearoa New Zealand.	Impacts (Local economic development, employment)	ZWN
	Commission research on multiplier effects of CREs	Further research commissioned/undertaken to explore this in the context of Aotearoa New Zealand. Could be an in-depth case study rather than a sector-wide study.	Impacts (Local economic development)	ZWN
	Average material composition research	Further research commissioned/undertaken to explore the composition of a range of common items. Priority categories include: ● Construction & Demolition waste ● Ewaste ● Clothes ● Furniture ● Whiteware	Outputs, outcomes (waste diversion)	ZWN/ZWN members

	Behaviour change interventions currently undertaken by ZWN members	Further research commissioned/undertaken to explore common frameworks and approaches.	Outcomes (behaviour change)	ZWN, ZWN members

6.7 Conclusion

This chapter has discussed the main findings of this research within the context of the academic and non-academic literature. It argues that the understanding of what is meant by the concept of impact within ZWN ranges from short term outputs to long term societal changes, and as such any work towards developing a shared approach to impact will need to take a broad definition of impact. Section 6.3 sought to answer the second research question 'what measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work?'. Key measures identified and discussed were: waste diversion; reuse impacts; GHG savings; return on investment; the impact of CRE's on pro-zero waste identity; stakeholder analysis; engagement with Te Tiriti; customer/participant engagement; employee and volunteer impacts, and; collaboration. Section 6.4 addressed the research question 'what are practical and resource considerations that should be taken into account when designing a shared impact methodology for the ZWN?', and discussed three aspects: audience, ease of use and timing. In addressing the research question 'which existing tools fulfill the needs of ZWN members in regards to shared impact measurement?', Section 6.5 examined eight different existing approaches to impact measurement considered worthy of inclusion in a shared impact framework for CREs. Section 6.6 lays out a pathway for future action towards a shared approach. The next chapter will conclude this thesis.

Chapter 7. Conclusion

7.1 Introduction

This chapter provides a summary of the main findings of this action research inquiry. Drawing upon ZWN members as representatives of the CRE sector, this research has sought to explore how CREs in Aotearoa New Zealand understand impact, and what their priorities for a shared impact framework are. The main limitations of this research are discussed, as are the implications of the research. Finally, some areas of future work and research are suggested.

7.2 Summary of the main findings

Research participants did not always view *impact* as being solely concerned with long-term change. Instead, it is used as a way to discuss "how good we are at doing good" (Paton, 2003, p.1), relying on a combination of output and outcome measures and qualitative and quantitative data to illustrate that.

A central proposition of the research is that CREs have environmental, cultural, social and economic dimensions. The four dimensions were investigated against the research questions. Existing methodologies and tools were identified and explored for relevance, effectiveness and alignment with the priorities expressed by research participants.

The key environmental impacts associated with the CRE model are waste diversion, particularly via reuse and the reduction in greenhouse gas emissions that comes from less demand for virgin materials and reduced waste disposal. A relatively easy step towards standardisation of CRE waste diversion data would be for ZWN members to develop and agree to a set of conversion factors, with the result that members could retain their existing data collection methods, while enabling a collated waste diversion total to be calculated and reported. Reuse and carbon metrics are in use in several other countries and have potential for application in Aotearoa New Zealand. However, these would require additional work in order

to provide an accurate picture of impact in the context of Aotearoa New Zealand, presenting an opportunity for future research.

It was identified that the wider waste sector prioritises data coming from disposal and recycling activities, whereas the focus for CREs is towards those activities higher up the waste hierarchy: education and reuse. In response, it is suggested that a simple waste hierarchy analysis of activities would produce an effective way of communicating this key point of difference of the CRE model.

Two main aspects of cultural impact were explored in this research - place-based aspects and organisational culture. Initial steps exploring how CREs engage with Te tiriti o Waitangi were taken and further work is required. It is suggested that ZWN has a role in encouraging ZWN members to examine how their work locally aligns with mana whenua aspirations, and that a shared impact project is one platform ZWN could utilise to do this. Being based in a local community is often a defining feature of a CRE. Information about how CREs interact and contribute to their local community could be presented via an analysis of in-kind contributions. It was identified that the relationship between working for a CRE and the development of a pro-zero waste identity would be a useful measure of impact, but further research is required.

Cultural impact was one area where the role of qualitative data in reporting impacts was explored. The Most Significant Change process was presented as an existing methodology for collecting and presenting impact stories that could be considered for inclusion in a shared impact approach. The development of pro-zero waste identity within CREs as well as CRE alignment with mana whenua aspirations both represent potential key domains for story collection.

An examination of the comparative employment intensity of different waste management activities was a key part of the discussion around social impacts. International research suggests that reuse activities produce significantly higher employment than recycling and disposal, and local research into this is identified as a key piece of supporting evidence for the value of the CRE model in Aotearoa New Zealand.

Volunteer contributions to the sector are also significant and warrant inclusion in a shared approach. Customer and participant numbers are a commonly gathered form of data, and this research suggests that this quantitative data could be coupled with a qualitative approach to produce a comprehensive account of these impacts. Behaviour change via zero waste education represents one of the most important impacts, but also one of the more difficult aspects to come up with a robust, meaningful approach in the context of shared impact. Further research is required before standardisation is possible, however focusing on qualitative data collection on behaviour change would produce valuable insights.

Basic financial data forms the basis of existing CRE impact reporting, however this could be strengthened by an exploration of local spend and in-kind contributions made by and to CREs. Inclusion of these aspects would offer a fuller picture of the local economic development impacts produced by CREs. Several existing tools such as local multiplier effects and social return on investment processes were found to be unsuitable for inclusion in a shared approach to impact measurement, without significant further research and/or investment.

7.2 Limitations

A key limitation of this research is that by attempting to encompass the full impact story of CREs, an in-depth analysis and understanding of specific aspects may have been missed. For example, measuring behaviour change impacts was identified by participants as a key priority. A review of the literature uncovered that it is a topic with a significant body of research associated with this topic. However, because this topic was one of many investigated in this research, it suffered from a shallow exploration, particularly in the data collection phase. The research tools could have been used to more deeply explore the types of behaviour change frameworks and approaches that are currently being used by ZWN members, as a way to establish if any commonalities do exist. However, the broad approach is well-justified when it comes to the exploratory nature of the research, and presents opportunities for future research.

Another limitation of this research is that participants were not randomly selected, but were, with a single exception, members of ZWN. The perspectives expressed and the findings are

therefore not representative of the general population, or even of practitioners within the wider waste sector. This lack of generalizability is a common limitation to a majority of qualitative research projects (Razaghi, 2016, p.383). However, given the research questions are focused on the ZWN, the decision to focus on ZWN members is a logical one.

Additional interviews could have been conducted. Only two formal interviews were conducted, and more interviews would have produced further in-depth data that may have impacted on the design of the survey and the rest of the research process. The inclusion of a representative from a CRE based in Aotearoa New Zealand in the interview phase may have produced additional insights. Conducting further interviews after the initial data analysis phase would have been a way of checking the validity of the research.

The response rate for the survey was 50.9%. More responses would have strengthened the research, however the action research framework encouraged frequent opportunities for engagement with ZWN members on the research, and the report back and focus group sessions at the Strengthening Communities Hui also presented an opportunity for sense-checking.

7.3 Implications

As an action research inquiry two important deliverables are expected: "an improvement in the investigated practice as a result of conducted courses of actions and reflections, and secondly, an improved understanding about the subject of the inquiry" (Razaghi, 2016, p.379).

At the level of practice, the findings have implications for ZWN staff and governance teams. The research takes ZWN a step closer towards a shared approach by providing a clear direction for future decisions, activity and research. ZWN members have a future role to play in the development of the project from research to practice, via consideration and adoption of the tools presented.

Because the approach to impact taken by this research is so broad, it may be a useful guide not just for CREs, but other mission-driven organisations, non-profits and community sector

networks, in regards to the design of impact projects and the consideration of different dimensions of impact. For CREs in Aotearoa New Zealand and overseas, this research has more specific implications - providing a comprehensive overview of the types of tools available to support the communication of their value to their local communities and to society generally.

The research reiterates the argument that detailed waste data has an important role in the provision of appropriate and effective waste management activities. Some of the tools examined and developed could be applied to the waste sector broadly. For example, the development and wide adoption of carbon metrics would be valuable in increasing understanding of the role that waste reduction and diversion can have in mitigating climate change. Adoption of the waste hierarchy analysis could encourage recognition of the important role reduction and reuse have in the creation of a truly circular economy.

At the level of policy, this research argues that the significant benefits from reduction and reuse activities warrant them receiving significant focus by policy makers. The view of the broader potential value created by waste activities has implications for investment in the sector - central and local government investment priorities and procurement processes could be used to create additional social, cultural, environmental and local economic outcomes for local communities in addition to the waste diversion outcomes that are commonly sought.

This research has made a contribution to the literature on impact measurement by identifying four dimensions of impact and providing analysis of these in regards to community resource recovery. In particular, the cultural impacts of CREs are largely unexplored in the literature, and the thesis fills this gap with an analysis of how these are currently understood and opportunities for future activity. It offers a contribution to the literature on zero waste by exploring how zero waste concepts and theories are implemented in practical terms by CREs and how significant value is created. Similarly, the thesis offers a contribution to action research literature by illustrating how it can be applied effectively to the development of impact measurement.

7.4 Future directions

This research has done a lot to build consensus around the priorities for ZWN, and has uncovered several aspects that need further research and/or discussion. As action research, the researcher has an on-going role within the CRE sector, and the recommendations made in Table 6.6 represent a clear pathway for future action to be considered and discussed by the researcher, ZWN staff, board and members. In particular, the development of a reuse metric and a statement of service provision template that covers some of the key outputs and outcomes is another key piece of future work. Once these are established they should be used by members and a review process undertaken to ensure the widest utility across the ZWN members, and for the wider CRE sector. At that point, systems to collect and collate data into a single place could be considered, moving the project from impact measurement across a number of organisations to a collective model.

In regards to further academic research, a number of aspects have been identified as offering potential depth to the analysis of CRE impact in Aotearoa and will be crucial in realising the development of the framework as envisioned. These are: the development of reuse and carbon metrics; research on employment intensity in the New Zealand waste sector, and; the role of zero waste education in creating behaviour change.

The four dimension model of impact could also be applied to the analysis of the impact of a single CRE, testing its robustness. Similarly, application of the model to other community networks with a different focus may unearth different aspects to the four dimensions.

7.5 Conclusion

A just transition away from the dominant "make-use-dispose" economic model to a circular economy will require a system-wide shift, and involves educating and enabling all levels of society to understand how to do this. Community resource recovery enterprises are actively involved in this work, seeking to prioritise activities at the top of the waste hierarchy in innovative and collaborative ways, and creating a range of social, cultural, economic and environmental benefits in local communities. This thesis has explored how the Zero Waste Network could facilitate the adoption of a shared approach to impact measurement and

reporting among its members. It represents an important step in moving the impact project forward towards implementation, and in amplifying the visibility of the CRE sector in Aotearoa New Zealand, and its significant impacts.

References

Abson, D. J., Fischer, J., Leventon, J., Newig, J., Schomerus, T., Vilsmaier, U., von Wehrden, H., Abernethy, P., Ives, C. D., Jager, N. & Lang, D. J. (2017). Leverage points for sustainability transformation. *Ambio*. 46, 30–39

Allen, M. (2018). *Reuse Impact Measurement Pilot Project: Final Report.* Sydney: Zero Waste Network Sydney

Asociación Española de Recuperadores de Economía Social y Solidaria. (2020). *Contra el cambio climático...YO REUTILIZO, ¿Y TÚ*? Retrieved from: http://reutilizayevitaco2.aeress.org/

Auckland Council. (2018). *Auckland Waste Management and Minimisation Plan 2018.* Auckland: Auckland Council.

Australian Bureau of Statistics. (2010). *Voluntary Work, Australia*. Canberra: Australian Bureau of Statistics

Avison, D.E., Lau, F., Myers, M.D. & Nielsen, P.A. (1999). *Communications of the ACM*, 42(1), 94-97

Bagnoli, L. & Megali, C. (2011). Measuring Performance in Social Enterprises. *Nonprofit and Voluntary Sector Quarterly*. 40(1) 149–165

Barraket, J., Collyer, N., O'Connor, M & Anderson, H. (2010). *Finding Australia's Social Enterprise Sector: Final Report*. Brisbane: Australian Centre for Philanthropy & Nonprofit Studies

Bartl, A. (2014). Moving from recycling to waste prevention: a review of barriers and enables. *Waste Management & Research*, 32(9), Supplement 3–18

Bernstein, S.L., Weiss, J. & Curry, L. (2020). Visualizing implementation: contextual and organizational support mapping of stakeholders (COSMOS). *Implementation Science Communication,* 1, 48

Big Lottery Fund. 2015. *Introduction to Impact Measurement.* Retrieved from: www.biglotteryfund.org.uk/er_impact_measurement.pdf

Bradbury, H.(2015) *The SAGE Handbook of Action Research*. SAGE Publications Ltd

Breznik, K. (2012). Ranking and visualizing the keywords in mission statements of Slovenian companies. Paper presented at the *Management, Knowledge and Learning Conference*, Celje, Slovenia

Brook Lyndhurst. (2007). *Establishing the Behaviour Change Evidence Base to Inform Community-Based Waste Prevention and Recycling: Technical Report.* UK: Brooke Lyndhurst

Burger, E. (2020). *How to Measure Volunteer Impact*. Retrieved from: https://www.volunteerhub.com/blog/measure-volunteer-impact/

Cabaj, M. (2017). S*hared Measurement: The why is clear, the how continues to develop.* Ontario: Tamarack Institute

Cameron, L. (2002). *Promoting Positive Environmental Behaviours Through Community Interventions: A case study of waste minimisation*. Hamilton: Environment Waikato

Charities Services. (2016). *Annual Reporting to Charities Services: A guide for Tier 3 charities.* Wellington, Charities Services

Charity Services. (2020). *Annual Returns.* Wellington, Charities Services. Retrieved from: https://charities.govt.nz/im-a-registered-charity/annual-returns/

Colquhoun, C. & Snow, W. (1995). *Recyclanomics: A study comparing the economics of recycling and conventional waste disposal in the Far North.* Kaitaia: CBEC

Community Sector Taskforce. (2006). *A New Way of Working for the Tangata Whenua, Community and Voluntary Sector in Aotearoa/New Zealand.* Wellington: Community Sector Taskforce.

Connolly, C. & Dhanani, A. (2009). *Narrative Reporting by UK Charities*. London: The Association of Chartered Certified Accountants

Cooper, J., Giousmpasoglou, C. & Marinakou, E. (2017). Occupational identity and culture: the case of Michelin-starred chefs. In: *International Journal of Contemporary Hospitality Management*, 2017, Vol. 29 (5), 1362-1379

Creswell, J. W. (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches (4th ed.).* Thousand Oaks, CA: Sage.

Darnton, A. (2008). GSR Behaviour Change Knowledge Review Reference Report: An overview of behavior change models and their uses. United Kingdom: Government Social Research Unit

Dart, J. J. & Davies R.J. (2003) A dialogical story-based evaluation tool: the most significant change technique, American Journal of Evaluation. 24(2),137-155

Denscombe, M. (2014) *The Good Research Guide: for small-scale social research projects (5th ed).* Maindenhead: Open University Press.

Dessein, J., Soini, K., Fairclough, G. and Horlings, L. (eds) 2015. *Culture in, for and as Sustainable Development. Conclusions from the COST action IS1007 investigating cultural sustainability.* Finland: University of Jyväskylä.

Ebrahim, A. and Rangan, V. (2014). What Impact? A Framework for Measuring the Scale and Scope of Social Performance. *California Management Review.* 56 (3), 118-141.

Eco-Cycle. Inc. (2008). *Zero Waste System diagram.* Colorado: Eco-Cycle Inc. Retrieved from: https://ecocycle.org/zerowaste/zero-waste-system

Ellen MacArthur Foundation. (2020). *Infographic Circular Economy System Diagram*. Retrieved from: https://www.ellenmacarthurfoundation.org/circular-economy/concept/infographic

Environment Network Manawatū Inc. (2020). *Palmy's Plastic Pollution Challenge.* Retrieved 2020 from: https://enm.org.nz/about/palmy-plastic-challenge

Environmental Protection Agency. (2002). *Resource Conservation Challenge: Campaigning Against Waste.* Retrieved from: https://nepis.epa.gov/resource_conservation/

Environment Protection Agency. (2014). C*alculating greenhouse gas emissions with the excel version of the waste reduction model.* Retrieved from: https://www.epa.gov/warm/versions-waste-reduction-model-warm#WARM%20Tool%20V14

Eunomia. (2015). *New Zealand Waste Data Framework Volume One: Definitions and Protocols for Waste to Disposal Facilities*. Auckland: Eunomia

EXITO. (2009). *Māori Cultural Perspectives on Waste and Zero Waste*. Wellington: EXITO

Fortuna, L. M., & Castaldi, M. J. (2018). New York City's Reuse impact calculator. *Waste Management & Research*, 36(12)

Gilbert, P. (2010). *Cultural Identity and Political Ethics*. Edinburgh: Edinburgh University Press.

Goldstein, M. (2014). *An Introduction to Impact Evaluation.* Poverty Reduction Group, The World Bank

Gordon-Burns, D. & Campbell, L. (2014). Biculturalism in early childhood education in Aotearoa/New Zealand: A consideration of attitudes, policy, and practice. *He Kupu,* 3(5). Retrieved from: https://www.hekupu.ac.nz/article/biculturalism-early-childhood-education-aotearoanew-zealand-consideration-attitudes-policy

Handley, S., Sabri, F. and Kazimirski, A. (2016). *Shared measurement: Greater than the sum of its parts.* London: Inspiring Impact

Hanleybrown, F., Kania, J. and Kramer, M. (2012). Channeling Change: Making collective impact work. *Stanford Social Innovation Review.* Retrieved from https://ssir.org/articles/entry/channeling_change_making_collective_impact_work#

Harmsworth GR, Awatere S (2013). Indigenous māori knowledge and perspectives of ecosystems. In Dymond JR ed. *Ecosystem services in New Zealand – conditions and trends*. Lincoln: Manaaki Whenua Press

Heck & Sweeney. (2013). Using Most Significant Change Stories to document the impact of the Teaching Teachers For The Future Project: An Australian teacher education story. *Australian Educational Computing*. 27 (3).

Henderson, M., Thompson, D. & Henderson, S. (2006) *Leading through values.* Auckland: HarperCollins Publishers

Herr, K. & Anderson, G. (2005). *The action research dissertation: a guide for students and faculty.* Thousand Oaks, California: Sage Publications

Hines, Morley, Frater, Cartwright & Chandrashekar. (2008). *Social Enterprises and Sustainable Waste And Resource Management: Evaluating impacts, capacities and opportunities*. Cardiff: The ESRC Centre for Business Relationships, Accountability, Sustainability and Society, Cardiff University

Hoornweg, D & Bhada-Tata, P. (2012). *What A Waste: a global review of solid waste management.* Washington DC: World Bank

Hoornweg, D. Bhada-Tata, P. & Kennedy, C. (2013) Waste production must peak this century. *Nature.* 502, 615-617

Independent Māori Statutory Board. (2019). *Data issues of significance.* Auckland: Independent Māori Statutory Board.

Institute for Local Self Reliance. (2002). *Recycling means business.* Retrieved from: https://ilsr.org/recycling-means-business/

International Labour Office. (2011). *Manual on the measurement of volunteer work*. Geneva: International Labour Office

Iorns Magallanes, C. J. (2015). Maori cultural rights in Aotearoa New Zealand: protecting the cosmology that protects the environment. *Widener Law Review*. 21(2), 273-327.

IPCC. (2007). *Fourth Assessment Report of the United Nations Intergovernmental Panel on Climate Change.* IPCC, Geneva, Switzerland

Kania, J & Kramer, M. (2011). Collective impact. *Stanford Social Innovation Review.* Retrieved from: https://ssir.org/articles/entry/collective_impact

Kaza, Silpa; Yao, Lisa C.; Bhada-Tata, Perinaz; Van Woerden, Frank. (2018). *What a Waste 2.0 : A Global Snapshot of Solid Waste Management to 2050.* Washington, DC: World Bank

Kegg, K., & King, S. (2014). *What is Evaluation, a brief introduction.* ANZEA, New Zealand.

Kelk, G. (2009). *Valuing Recycle Town: Measuring which bucket has the most leaks.* Auckland: Community Recycling Network

Kemmis, Stephen, & Mctaggart, R. (2007). Participatory Action Research: Communicative action and the public sphere." In Denzin, NK & Lincoln, YS (Eds.), *Strategies of qualitative inquiry*. (3rd ed., pp. 271-330.)

Kramer, M., Parkhurst, M. and Vaidyanathan, L. (2009). *Breakthroughs in Shared Measurement and Social Impact*. Massachusetts: FSG Social Impact Advisors

Lakhotia, S. (2017). *Measuring Impact with Social Return on Investment*. Auckland: Te Pou Matakana

Lewis, D. (2002). Organization and management in the third sector toward a cross-cultural research agenda. *Nonprofit Management & Leadership*, 13 (1)

Lombardi, E. (2016). *The Circular Economy Isn't the Waste Business As Usual.* Retrieved from: https://www.waste360.com/waste-reduction/circular-economy-isn-t-waste-business-usual

Lune, H. & Berg, B. (2017). *Qualitative Research Methods for the Social Sciences* (9th ed). Boston: Pearson

Mauch, C. (2016). Introduction: The Call for Zero Waste. In Mauch, C. (Ed.) *A Future without Waste? Zero Waste in Theory and Practice* (p.5-11). Munich: Rachel Carson Center for Environment and Society

McNeill, J., Barraket, J., and Elmes, A. (2017). *Community Recycling Enterprises: NSW Impact Measurement Project*. Melbourne: Community Recycling Network Australia/Centre for Social Impact Swinburne

Meadows, D. (2008). *Thinking in systems: a primer*. White River Junction, Vt. : Chelsea Green Pub

Merriam-Webster. (2020). *Impact.* Retrieved from: https://www.merriam-webster.com/dictionary/impact

Michaelson, J., Mahony, S., & Schifferes, J. (2012). *Measuring Well-being: a guide for practitioners.* London: New Economics Foundation

Millar, R. & Hall, K. (2013). Social Return on Investment and performance measurement: the opportunities and barriers for social enterprises in health and social care. *Public Management Review,* 15(6), 923- 941

Ministry for the Environment (MfE). (2019). *Reducing Waste: a more effective landfill levy – consultation document*. Wellington: Ministry for the Environment.

Ministry for the Environment. (2010). *The New Zealand Waste Strategy*. Wellington, Ministry for the Environment. Retrieved from: https://www.mfe.govt.nz/sites/default/files/wastestrategy.pdf

Ministry for the Environment. 2019. *Measuring Emissions: A Guide for Organisations*. Wellington: Ministry for the Environment.

Ministry for the Environment. (2020a). *Reducing waste: a more effective landfill levy: Summary of submissions.* Wellington: Ministry for the Environment.

Ministry for the Environment, (2020b). *Circular economy – Ōhanga āmiomio*. Wellington: Ministry for the Environment. Retrieved from: https://www.mfe.govt.nz/waste/circular-economy

Morgan, Te Kipa Kepa Brian. (2006). Decision-support tools and the indigenous paradigm. Proceedings of the Institution of Civil Engineers Engineering Sustainability. In *Engineering Sustainability*. ESO, 1-9

Muir, K & Bennett, S. (2014). *The Compass: Your Guide to Social Impact Measurement.* Sydney: The Centre for Social Impact.

NEF Consulting. (2018). *Local Multiplier 3 (LM3)*. Retrieved from: https://www.nefconsulting.com/our-services/evaluation-impact-assessment/prove-and-improve-toolkits/local-multiplier-3/

Ní Ógáin, E., Svistak, M., and de Las Casas, L. (2013). *Blueprint for shared Impact: Developing, designing and implementing shared approaches to impact measurement.* London: Inspiring Impact

Nowland-Foreman, G. (2015). Outcomes, Accountability and Community & Voluntary Organisations: Holy Grail, Black Hole or Wholly Possible? Paper presented to the National Council of Voluntary Organisations (NCVO)/Institute for Volunteering Research/Voluntary Sector Studies Network (VSSN) *Voluntary Sector and Volunteering Research Conference,* 8-9 September 2015, Leeds Beckett University, UK.

Oregon Metro. (2015). *Waste Prevention, Reuse and Recycling Education: A handbook of principles and best practices.* Portland: Oregon Metro

Para kore. (2020). *What is para kore*. Retireved from: http://parakore.maori.nz/para-kore/what-is-para-kore/

Parliamentary Commissioner for the Environment. (2006). *Changing behaviour: Economic instruments in the management of waste*. Wellington: Parliamentary Commissioner for the Environment.

Paton, R. (2003). *Managing and Measuring Social Enterprises*. Sage, London.

Pauling, C. (2005). Project uncovers Maori perspectives on better waste management. *Landcare Research Discovery, 12. Retrieved from:* https://www.landcareresearch.co.nz/__data/assets/pdf_file/0008/36296/DiscoveryIssue12.pdf

Pizzirani, S., McLaren, S., Forster, M., Pohatu, P., Porou, T. & Warmenhoven, T. (2018). The distinctive recognition of culture within LCSA: realising the quadruple bottom line. In *International Journal of Life Cycle Assessment.* 23, 663–682

Planz, M.C., Greenway, M. T. and Hendricks, M. (1997). *New Directions for Evaluation,* 1997(75)

Pope, J. (2011). *Indicators of community strength in Victoria: framework and evidence.* Melbourne: State Government Victoria.

Preuss, M. (2016). Return on Investment and Grants: A Review of Present Understandings and Recommendations for Change. *Research Management Review,* 21(1)

PriceWaterhouseCoopers Consulting (2018). *Economic contribution of the music industry in New Zealand 2016.* Retrieved from*:* https://www.recordedmusic.co.nz/wp-content/uploads/2018/05/NZ-Music-Industry-Economic-Report-2016-Final.pdf

Pucetaite, R., Novelskaite, A., Lamsa A. & Riivari, E. (2016). The relationship between ethical organisational culture and organisational innovativeness: comparison of findings from Finland and Lithuania. *Journal of Business Ethics,* 139 (4) Special Issue on The 27th EBEN Annual Conference in Berlin (December 2016)

Ravasi, D. & Schultz, M. (2006). Responding to organizational identity threats: exploring the role of organizational culture. *Academy of Management Journal,* 49(3), 433–458.

Razaghi, M. (2016). An Action Research Inquiry into Professional Training and Development for Addressing Complex Urban Problems. [Doctoral Thesis, École Polytechnique Fédérale De Lausanne].

Reuse Network. (2017a). *Product Weight Protocol.* Retrieved from: http://www.frn.org.uk/product-weight-protocol.html

Reuse Network. (2017b). *Membership Form 2017/18.* Retrieved from: http://www.frn.org.uk/images/frn/Membership_2017/FRN-MEMBERSHIP_FORM_BLANK_-_2017.pdf

Russell Recyclers. 2018. *About us.* Retrieved from: http://www.russellrecyclers.nz/about-us/

Sage, E. (2020). *Government steps up action on waste - funds recycling infrastructure and expands levy scheme. Retrieved from:* https://www.beehive.govt.nz/release/government-steps-action-waste-funds-recycling-infrastructure-and-expands-levy-scheme

Saidani, M., Yannou, B., Leroy, Y. and Cluzel, F. (2017). How to assess product performance in the circular economy? Proposed requirements for the design of a circularity measurement framework. *Recycling,* 2(6).

Sarantakos, S. (2013). *Social Research* (4th ed). Hampshire: Palgrave Macmillan.

Secretary-General's Independent Expert Advisory Group on a Data Revolution for Sustainable Development (IEAG). (2014). *A World That Counts: Mobilising the data revolution for sustainable development.* Geneva: United Nations

Social Value UK. (2018). *What is the relationship between collective impact and SROI?* Retrieved from: https://socialvalueint.org/wp-content/uploads/2018/06/SROI-and-Collective-Impact-rebranded.pdf

Snow, W. (2015*). The Incentive to Recycle: the case for a container deposit scheme in New Zealand*. Auckland: Envision

Statistics New Zealand. (2013). *National Accounts input-output tables: Year ended March 2013.* Wellington: Statistics New Zealand

Statistics New Zealand. (2016). *Non-profit organisations contribute $6 billion to economy.* http://archive.stats.govt.nz/browse_for_stats/economic_indicators/NationalAccounts/non-profit-2013-mr.aspx#gsc.tab=0

Statistics New Zealand. 2020. *Material intensity.* Retrieved from: https://wellbeingindicators.stats.govt.nz/en/material-intensity-including-recycling-land-fill-inflows-second-hand-economy/

Staub, C. (2017). Experts offer look at evolving world of recycling data. *Resource Recycling.* Retrieved from: https://resource-recycling.com/recycling/2017/09/12/experts-offer-look-evolving-world-recycling-data/

Sweeney, D. (2009). *Show me the Change: A review of evaluation methods for residential sustainability behaviour change projects*. Melbourne: Swinburne University of Technology

Tantirigama, T. & Taniguchi-Singh, M. (2009). *Economic Impacts of Transport & Tourism in New Zealand: an Input-output Multipliers Approach.* Paper presented at NZAE conference 2009. Retrieved from: https://www.nzae.org.nz/wp-content/uploads/2011/08/Economic_Impacts_of_Transport_and_Tourism_in_New_Zealand.pdf

Taplin, D & Clark, H. (2012). *Theory of Change Basics: A primer on theory of change.* New York, ActKnowledge

Te Puni Kōkiri and the Treasury. (2019). *An Indigenous Approach to the Living Standards Framework.* Wellington: Te Puni Kōkiri

Treaty Resource Centre. (2016). *Ngā Rerenga o Te Tiriti.* Auckland: Treaty Resource Centre.

Trotman, Rachael. (2018). *Fringe to Centre: The Zero Waste Network story.* Retrieved from: zerowaste.co.nz/assets/Final-Zero-Waste-Story-Nov-2018.pdf

Turner, D., Williams, I. & Kemp, S. (2015). Greenhouse gas emission factors for recycling of source-segregated waste materials in *Resources, Conservation and Recycling.* 105,186–197.

United Nations Environment Programme (UNEP). (2012). *21 Issues for the 21st Century: Results of the UNEP Foresight Process on Emerging Environmental Issues*. United Nations Environment Programme (UNEP), Nairobi, Kenya,

UNESCO. (1982). *Mexico City declaration on cultural policies.* Available from: http://portal.unesco.org/culture/en/ev.php-URL_ID¼12762&URL_DO¼DO_TOPIC&URL_SECTION¼201.html

United Nations Environment Programme, 2015. *Global Waste Management Outlook.* Retrieved from: http://wedocs.unep.org/bitstream/handle/20.500.11822/9672/-Global_Waste_Management_Outlook-2015Global_Waste_Management_Outlook.pdf.pdf?sequence=3&isAllowed=y

VanSandt, C. V., Sud, M. & Marme, C. (2009). Enabling the original intent: catalysts for social enterprise. *Journal of Business Ethic*s 90, 419–428

Vernon, J. & George, C. (2001). *Employment Effects of Waste Management Policies.* London: Risk & Policy Analysts Limited

Volunteering Australia. 2015. *Key facts and statistics about volunteering in Australia: Fact sheet.* Retrieved from: https://volunteeringaustralia.org/wp-content/uploads/VA-Key-statistics-about-Australian-volunteering-16-April-20151.pdf

Waste and Action Resources Programme (WRAP). (2011). *A methodology for quantifying the environmental and economic impacts of reuse*. London: WRAP

WasteMINZ (2015). *New Zealand Waste Data Framework: Review of international waste data practice.* Auckland, WasteMINZ

WasteMINZ Territorial Authority Forum. (2018). *Local Government Waste Management Manifesto.* Retrieved from https://www.wasteminz.org.nz/wp-content/uploads/2018/01/Local-Government-Waste-Manifesto-final-22012018.pdf

Were, L. 2019. *Zero Waste Network exploring impact measurement: key messages from network hui held 21st February 2019 to the Zero Waste Network Board* (internal report). Auckland, Zero Waste Network

Whetten, D. A., & Mackey, A. (2002). A social actor conception of organizational identity and its implications for the study of organizational reputation. *Business and Society*, 41, 393–414.

Wilder, L. and Walpole, M. (2008). Measuring social impacts in conservation: experience of using the Most Significant Change Method. *Oryx.* 42(4), 529–538

Williams, N., Croker, M. and Barrett, D, (2005). *Review of the Voluntary and Community Waste Sector in England.* United Kingdom, The Inhouse Policy Consultancy

Wishart, L. (2015). *A Resourceful Aspiration: Understanding the governmentality of zero waste in Scotland* [Doctoral Thesis, University of St Andrews].

Wilson. A. (2001). Understanding organisational culture and the implications for corporate marketing. *European Journal of Marketing*. Vol. 35 (3/4), 353-367.

World Economic Forum, Ellen MacArthur Foundation and McKinsey & Company, The New Plastics Economy. (2016). *Rethinking the future of plastics.* Retrieved from: http://www.ellenmacarthurfoundation.org/publications

Xtreme Zero Waste. (2020). *Home.* Retrieved from http://xtremezerowaste.org.nz/

Yousefpour, N., Barraket, J. & Furneaux, C. (2012). *A baseline study of Australia's community recycling enterprises.* Brisbane: University of Queensland.

Zalatar, W. F., & Clark, E.E. (2019). Development of a Quadruple Bottom Line-based Composite Sustainability Index to Measure Sustainable Performance. *Proceeding of the 2019 IEEE International Conference on Industrial Engineering and Engineering Management (IEEM)*

Zaman, A and Swapan, M. (2016). Performance evaluation and benchmarking of global waste. *In Resources, Conservation and Recycling* 114, 32–41

Zaman, A. (2013). Identification of key assessment indicators of the zero waste management systems. *Ecological Indicators.* 36, 682– 693

Zaman, A. (2015). A comprehensive review of the development of zero waste management: lesson learned and guidelines. *Journal of Cleaner Production,* 91, 12-25

Zero Waste International Alliance (2018). *Zero Waste Hierarchy of Highest and Best Use 6.0*. Retrieved from: http://zwia.org/zwh/

Zero Waste Network. (2013). *Stronger communities manifesto*. Auckland: Zero Waste Network. Retrieved from: http://zerowaste.co.nz/assets/CRN-stronger-communities-2012-.pdf

Zero Waste Network. (2017). *Strengthening Communities Hui 2017 Impact workshop (internal report).* Auckland: Zero Waste Network

Zero Waste Network. (2018a). *Our Story*. Retrieved from: http://zerowasate.co.nz/about/our-story/

Zero Waste Network. (2018b). *Becoming a Member*. Zero Waste Network. Retrieved from: http://communityrecyclers.org.nz/community/becoming-a-member/

Zero Waste Network. (2018c). *Making the most of waste on Aotea Great Barrier*. Auckland Zero Waste Network.

Zero Waste Network (2019a). *Zero Waste Network Manifesto.* Auckland, Zero Waste Network

Zero Waste Network. (2019b). *Circular Economy Discussion Document (internal report)*. Auckland, Zero Waste Network

Zero Waste Network. (2020a). *Membership database (internal database)*. Auckland, Zero Waste Network

Zero Waste Network (2020b). *Waste to Energy Incineration*. Retrieved from: http://zerowaste.co.nz/waste-to-energy-incineration/

Zero Waste Network. (2020c) *Zero Waste Network Presentation to Our Zero Waste World Summit*. Retrieved from: https://www.summit.zerowaste.co.nz/watch

Zero Waste Network. (2020d). *Leverage points towards zero waste.* Auckland: Zero Waste Network.

Zero Waste Network (2020e). *Waste hierarchy diagram*. Auckland: Zero Waste Network. Retrieved from: https://zerowaste.co.nz/why-zero-waste/

Zero Waste Scotland. (2013). *The Scottish Carbon Metric: briefing paper for stakeholders*. Stirling: Zero Waste Scotland

Appendices

Appendix 1. Theory of Change models for the key zero waste activities undertaken by CRE's (education, reuse and recycling)

Reduction Activities - Zero Waste Education	
Goals	
	Less resource use
	Less waste created
	Conscious consumers
	Zero waste behaviour is normal eg buying less, buying better quality, sharing of products
	Better design
	Supportive legislative environment eg Right to repair
Inputs	Behaviour change model
	Educational resources
	Examples in the community to reference
	Educators
	Designers
	Administrators
	Marketing and Comms to encourage better/different consumption
	Vehicles
	Education spaces
	Training opportunities for educators
Activities	Education
	Design of training and resources
	Admin associated with running education - bookings, health & safety, invoicing
	Activities to influence curriculum, plus encourage need for resource education
	Site tours (showcase)
	Networking opportunities for professional development + gaining

	customers
Outputs	Number of Workshops + participants
	Number of + Sales of new, zero waste products (eg Reusables, designed to last)
	Number of site tour + participants
	Businesses employ zero waste principles as part of their operation
Outcomes	Workshop participants report learnings/changes to behaviour
Short-term	Increase in number of products + sales
Outcomes	innovative product design
mid-term	
Outcomes	Adoption of a zero waste mindset
long-term	low carbon
	reduce environmental impacts - leachate, marine debris, air pollution
Impacts	Healthy environment
	Resilient, resourceful communities
	Engaged people
	Circular economy

Reuse Activities	
Goals	Income for CRE
	Affordable goods available to community
	Jobs created
	Resources are valued
	Repair, refurbishment, retail skills are valued
	Prosperous communities
	Supportive legislative environment eg Right to repair
Inputs	Shop space
	People (more than recycling, with retail/customer service/reuse expertise
	Workshop space
	Tools
	Shelving
	POS
	Energy for running retail sites

	Vehicles
Activities	Reuse shop
	Value Add activities
	Repair
	Upcycling
	Refurbishment
Outputs	Products sold
	Customer satisfaction data
	Number of customers
Outcomes	Displacement of new products
Short-term	Buy local
	Local employment
	Waste diverted
Outcomes	Innovative product design
mid-term	
	People have access to what they need
Outcomes	low carbon
long-term	reduce environmental impacts - leachate, marine debris, air pollution
Impacts	Healthier environment
	Resilient communities
	Less Poverty

Recycling Activities	
Goals	Materials go around and around
	Resources are valued
	Local markets for materials exist
	Manufacturers take responsibility for their products across their entire lifecycle
Inputs	Jobs - the more separation that happens, the more jobs are created
	Sorting and processing space
	Tools and equipment
	Transport

	Energy for collection, sorting and reprocessing
Activities	Collections
	Sorting
	Processing
Outputs	Waste diversion - Materials to replace virgin stock
	Number of Collection runs
	Number of Drop off sites
Outcomes	High quality products are produced
Short-term	Jobs created: hand sorting = high labour model
Outcomes	Investment in local processing infrastructure
mid-term	Design with end of life in mind
Outcomes	Local reprocessing exists
long-term	Reduction of dependency on imports
	Consumers actively choose products that are easily recycled and avoid those that aren't
	Low-carbon
	Reduce environmental impacts - leachate, marine debris, air pollution
Impacts	Healthy environment
	Resilient communities

Appendix 2. Options for impact measurement tool spreadsheet

	Impact	Quantitative data	Qualitative data	Measure	Requires	Exists already within ZWN	Suitable for inclusion with some work	Reduction	Reuse	Recycling	All waste activities	Completed where?	Notes
Economic Development Impacts													
	Financial performance	☑	☐	Turnover	Access to profit & loss statement	☑	☐	☐	☐	☐	☑	Trial survey	Data already being captured by charity services reporting. DIA report that as long as the basic information required in the annual return is covered, they do not mind what impact is reported. They agreed there would be no problem in ZWN developing a template for additional impact measures.
	Progress towards being self-funding	☑	☐	% trading income compared to the year before?	Access to Year on Year info or Approximately what proportion of revenue was derived from each source? + amounts	☑	☐	☐	☐	☐	☑	Trial survey	
	Contribution to the local economy.	☑	☐	Total spend (wages, local suppliers) multiplied by agreed multiplier	Multiplier calculations	☐	☐	☐	☐	☐	☑	Longer term	Too complex at this stage, talk to Gary about this
	Contribution to the local economy.	☐	☑	Statement on financial impact of org on community?	Someone important talking about how the member contributes eg Business Association, Politician, local friendly economist.	☐	☐	☐	☐	☐	☑	Requires extra time by member to complete	What are the types of questions we would need to ask them to get a good quote?
	Contribution to the local economy.	☑	☐	Value of money spent with local contractors and on wages	Access to expense data	☐	☐	☐	☐	☐	☑	Trial survey	
	Return to local government	☑	☐	Local Govt funding v's total spending	Access to profit & loss statement + funding data	☐	☑	☐	☐	☐	☑	Trial survey	
	Return to central government	☑	☐	Value of tax paid	Access to GST + income tax	☐	☑	☐	☐	☐	☑	Trial survey	
	Contribution to economy	☑	☐	Average wage info for range of roles	Adapt existing ZWN questionnaire	☐	☑	☐	☐	☐	☑	Requires extra time by member to complete	Could be useful in establishing the value of support given to other orgs/projects
	Financial support/time spent on other projects/orgs	☑	☐	Value and/or total hours spent	Need an easy way of capturing as this is happening all the time.	☐	☐	☐	☐	☐	☑	Trial survey	
	Financial value of in-kind contributions coming in to members	☑	☐	Total in-kind hours	Agreed average by which to mulitply total hours by in order to calculate $ value	☐	☑	☐	☐	☐	☐	Use ZWN charge out rate $85	
	Attracting other funding	☐	☐			☐	☐	☐	☐	☐	☐		
		☐	☐			☐	☐	☐	☐	☐	☐		
Environmental impacts													
	Waste diversion – Particularly around reuse	☑	☐	Diversion by waste stream	Diversion data from members, weight is best. Conversion methods for volume and number to weight. Average weights and common product categories	☑	☐	☐	☑	☑	☐	In survey, but may require data collected using agreed catagories over period of time	Could include Reduction activities if there was enough data to prove diversion eg comparative data
	GHG Savings.	☑	☑	Total waste diverted converted to GHG emissions savings	Conversion factors	☐	☑	☐	☑	☑	☐	In survey, but may require data collected using agreed catagories over period of time	Could be presented by material eg metal, clothes. And compared to number of cars
	Trees planted	☑	☐	Number of plants	Survey	☐	☐	☐	☐	☐	☑	Trial survey	Only applicable to some members
	Waste hierarchy analysis	☑	☐	Time or resource spent on each activity	Analysis of time spent/total expense across activity category	☐	☑	☐	☐	☐	☑	Trial survey	
	Amount of material processed onshore	☐	☐			☐	☑	☐	☑	☑	☐		
	Energy use	☑	☐	kWhours, $ spent, distance traveled	Access to power bill/fuel/taxi/flight costs - EKOS system?	☐	☐	☐	☐	☐	☑	Longer term	Negative env impact, but useful to see change over time? Also could tie in to carbon offsetting project

	Impact	Quantitative data	Qualitative data	Measure	Requires	Exists already within ZWN	Suitable for inclusion with some work	Reduction	Reuse	Recycling	All waste activities	Completed where?	Notes
Social Impacts													
	Community participation in services and programmes. Community connections.	☑	☑	Customer/attendee numbers	Case-study template or suggested question to get them to ask participants.	☑	☐	☐	☐	☐	☑	Trial survey	Labelled as Customer Analysis
	Customer satisfaction	☑	☑	% of customers would recommend	Customer survey	☑	☐	☐	☐	☐	☐	In survey, but will require extra time spent by member	Labelled as Customer Analysis
	info accessed	☐	☑			☐	☐	☐	☐	☐	☐		
	Types of projects undertaken	☐	☑	Activity analysis	List of all possible activities undertaken. Include in	☐	☑	☐	☐	☐	☑	Trial survey	
	Collaboration and partnerships	☑	☑	Number of collaborative projects, number of community links. Statement on what collaboration looks like/brings	Checklist with space to give estimated number of links. Case-study template or suggested question to get them to ask partner organisations	☐	☑	☐	☐	☐	☑	Trial survey	Labelled as Collaborative Project Analysis. Need to define the different types of relationships eg groups you partner with, funders, formal supporters
	Collective knowledge	☑	☐	Hours spent on supporting other organisations/projects	Survey	☐	☑	☐	☐	☐	☐	Trial survey	Labelled as Collaborative Project Analysis.
	Access to affordable goods	☑	☐	Value of sales.To what extent the network and its members facilitates access to affordable goods to low income households	Access to sales data or inventory data if sales are not being made. Would be ideal if there was an average price list	☐	☐	☐	☑	☐	☐	Trial survey	
	Employment	☑	☐	FTE's + total number for each activity type (Reduction, Reuse, Recycling)		☑	☐	☐	☐	☐	☑	Trial survey	Data already being captured by charity services reporting
	In-kind contributions	☑	☐	FTE's + number		☑	☐	☐	☐	☐	☑	Trial survey	Data already being captured by charity services reporting
	Reducing barriers to employment	☐	☑	Stories about how these organisations reduce barriers to employment.	Case study template	☐	☐	☐	☐	☐	☑	In survey, but will require extra time spent by member	
	Meaningful work	☐	☑	Stories about how these organisations offer meaningful work	Case study template	☐	☐	☐	☐	☐	☐	In survey, but will require extra time spent by member	
	Behaviour change up the waste hierarchy	☐	☑	Stories about how engagement and education programmes create positive behaviour change	Case study template and/or quantitative measure of bahaviour change developed.	☐	☐	☑	☐	☐	☐	In survey, but will require extra time spent by member	Quantitative hard to do, maybe focus on qual
	Engagement with vulnerable communities	☐	☑	Stories about engagement with vulnerable communities	Case study template	☐	☐	☐	☐	☐	☐	In survey, but will require extra time spent by member	Could be a survey question but would need appropriate framing
Cultural Impacts													
	Cultural Identity	☑	☑	To what extent this work impacts on cultural identity and engagement	Survey of staff and/or workshop particpants/customers OR case study eg questions like What were the most important reasons you originally chose to get involved in	☐	☑	☐	☐	☐	☑	In survey, but will require extra time spent by member	
	Place based Identity	☑	☑	To what extent this work impacts on place-based identity and engagement		☐	☑	☐	☐	☐	☑	In survey, but will require extra time spent by member	
	Global citizen identity	☑	☑	To what extent this work impacts identity as a 'global citizen'		☐	☑	☐	☐	☐	☑	In survey, but will require extra time spent by member	
	Pro-waste identity	☑	☑	To what extent this work impacts on the development of a 'pro zero waste' identity		☐	☑	☐	☐	☐	☑	In survey, but will require extra time spent by member	
	Acknowledgement of Te Tiriti o Waitangi	☑	☑	Number of members who acknowledge Te Tiriti o Waitangi in their organisational mission or activities	Survey question. Yes or no + how	☑	☐	☐	☐	☐	☑	Trial survey	

Appendix 3. Survey tool

Introduction

The Zero Waste Network (ZWN) is developing a shared impact framework. This is a collaborative approach to the collection, analysis and reporting of data about the impact of the network and its members.

In this context, 'impact' means the difference the work you do is making. It is both the outputs of your work, and the longer term outcomes and changes that are a result of your work.

ZWN thinks impact reporting is important because it can give community stakeholders reasons to engage with your work, provide funders with an understanding of the results their investments are having, and guide internal decision-making and direction setting.

A shared approach can:

- Increase the potential to influence change at a wider level
- Give context to an individual organisation's impact data
- Improve standards of impact measurement
- Save time and resources by pooling expertise and resources for the development of one tool, rather than many

Dorte Wray, Executive Officer of ZWN, is undertaking her Master's thesis research at Massey University on this topic using a research methodology called action research, which applies academic research to real world problems. The outcomes of this research will be made available to the Zero Waste Network and it's members and stakeholders, with the hope of contributing to the development of a working shared impact framework.

This survey aims to facilitate learning about what measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work, and what are perceived as important practical and resource considerations when designing a shared impact framework for ZWN.

It will take approximately 20 minutes. The survey is best completed by someone at senior management level, who has a good understanding of the current activities and reporting practices of your organisation.

All responses will remain anonymous and no participants will be identified in any way.

Participation in this research is completely voluntary. You are under no obligation to participate.

At all times you have the right:

- To ask any questions about the research
- To decide that you do not want to take part in this study

- To decide not to answer any of the questions asked
- To withdraw from the study

* 1. **By ticking the checkbox below you are indicating that you agree to participate in this study under the conditions set out above.**

☐ I agree to participate in this research

If you have any questions about this research please contact Dorte Wray, telephone: 021 975 352 email: dorte@zerowaste.co.nz or Karen Hytten, Lecturer in Environmental Management, telephone: 06 951 6089, email: k.hytten@massey.ac.nzThis project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 19/26. If you have any concerns about the conduct of this research, please contact Dr Rochelle Stewart-Withers, Chair, Massey University Human Ethics Committee: Southern B, telephone 06 356 9099 x 83657, email humanethicsouthb@massey.ac.nz

Section A

*** 2. Contact details**

Name:
Organisation:
Your role in the organisation:
Email Address:

3. What is the purpose or mission of your organisation?

4. What waste related activities is your organisation involved in? (Please check all that apply)

☐ Zero Waste Education
☐ Reuse
☐ Recycling
☐ Other (please specify) :

5. What do you consider to be the PRIMARY resource recovery activity of your organisation?

☐ Zero Waste Education
☐ Reuse
☐ Recycling
☐ Other (please specify)

6. Which of the following statements are goals of your organisation (please check all that apply).

☐ We are involving our local community
☐ Zero waste is important to our community
☐ We are diverting waste from landfill
☐ We are creating meaningful employment
☐ We are creating inclusive employment
☐ We are financially sustainable
☐ We are contributing to our local economy
☐ We have a positive influence on people's waste behaviours

Section B. Reporting & Measurement

7. What kind of reporting do you currently undertake? (please check all that apply). Charity Services Annual Return

☐ Annual Report
☐ Funding and/or contract reports
☐ Board reports
☐ Not applicable
☐ Other (please specify)

8. If you complete a Charities Services Annual Return, what reporting tier do you currently report under?

☐ Tier 1
☐ Tier 2
☐ Tier 3
☐ Tier 4
☐ Unsure
☐ Not Applicable

9. What is the Year End date for your financial accounts?

☐ 31 March
☐ 31 June
☐ Don't know
☐ Other (please specify)

10. How important is impact measurement to your current organisational strategy?

Not at all important	Not so important	Somewhat important	Very important	Extremely important	Not sure

11. In your own words, please briefly describe what kinds of impact your organisation aims to achieve.

12. How important are these potential audiences of impact reporting for your organisation?

	Not at all important	Not so important	Somewhat important	Very important	Extremely important	Not sure
Public (eg your local community)						
Internal audiences (eg staff, management and governance)						
Funders and investors						
Central						

Government						
Local Government						

13. How important do you think the following practical considerations are when designing an impact framework?

	Not at all important	Not so important	Somewhat important	Very important	Extremely important	Not sure
The cost of developing the framework						
The ongoing cost of using the impact framework						
Time required to use the framework						
Usefulness for telling our impact story to a wide audience						
Usefulness for telling our impact story to a specific audience						
Confidentiality of our data						
Ease of use of the framework once developed						
Complementing existing reporting requirements						

Other (please specify)

Section C - Social Impacts and Measures

14. Do you measure any social impacts your organisation has?

☐ Yes

☐ No

15. If yes, what are these?

16. Please indicate how USEFUL you think the following measures of social impact would be for your organisation

	Not at all useful	Not so useful	Somewhat useful	Very useful	Extremely Useful	Not sure
Customer/participant engagement (eg. satisfaction and reach)						
Collaboration (eg. in-kind support received and given)						
Employee and volunteer analysis (eg. number of employees and volunteers)						
Activity analysis (eg. Number and type of projects)						

Other (please specify)

Section D - Economic Impacts and Measures

17. Do you measure any economic impacts your organisation has?

☐ Yes

☐ No

18. If yes, what are these?

19. Please indicate how USEFUL you think the following measures of economic impacts would be for your organisation.

	Not at all useful	Not so useful	Somewhat useful	Very useful	Extremely useful	Not sure
Financial performance (eg. turnover or net profit/loss)						
Contribution to the local economy						
Funding analysis (eg. what proportion of revenue was derived from each source)						
Return on investment (eg. for Councils or other funders)						
Value of in-kind contributions given and received						

Other (please specify)

Section E - Cultural Impacts and Measures

In this section we're interested in how best to explore the links between working in resource recovery and cultural identity.

"A person's cultural identity comes from the way they take certain aspects of each of the cultures they belong to and use them to shape and define who they are" (from the Common Ground website).

20. Do you measure any cultural impacts your organisation has?

☐ Yes

☐ No

21. If yes, what are these?

22. Please indicate how USEFUL you think the following measures of cultural impact might be for your organisation.

	Not at all useful	Not so useful	Somewhat useful	Very useful	Extremely useful	Not sure
To what extent this work impacts on the cultural identity of your employees						
To what extent this work impacts on your employees place-based identity						
To what extent this work impacts on the identity of your employees as a 'global citizen'						
To what extent this work impacts on 'pro zero waste' identity of your employees						
Exploring the ways your organisation engages with Te Tiriti o Waitangi						

Section F - Environmental Impacts

23. Do you measure waste diversion in any way?

☐ Yes

☐ No

24. If yes, what metric do you use to measure waste ? (please check all that apply).

☐ Weight

☐ Volume

☐ Number

☐ Other (please specify)

25. Do you measure any other environmental impacts your organisation has?

☐ Yes

☐ No

26. If yes, what are these?

27. Please indicate how USEFUL you think the following measures of environmental impacts would be for your organisation.

	Not at all useful	Not so useful	Somewhat useful	Very useful	Extremely useful	Not sure
Waste diversion						
Waste hierarchy analysis (eg. proportion of time spent on reuse compared to recycling)						
Greenhouse gas emission savings						
Trees planted						

28. Is your organisation involved in reuse activities?

☐ Yes

☐ No

Section F – Reuse

You only need to answer the questions on this page if your organisation is involved in reuse

29. If you have a point of sale system in place, which of the following categories does it cover? (Check all that apply)

☐ Animal
☐ Appliances
☐ Baby items
☐ Books
☐ Building & Renovation
☐ Clothing and Fashion
☐ Electronics & home entertainment
☐ Garden
☐ Home
☐ Outdoor living
☐ Sports
☐ Upcycled goods
☐ Vehicles & boats
☐ Other (please specify)

30. Would you consider changing your category list if it would enable the standardization of data about the impact of reuse across Zero Waste Network members?

☐ Yes
☐ No
☐ Maybe

31. What is the name of the Point of Sale system/software you currently use?

32. Do you have a system to guide the pricing of items in your reuse shop?

☐ Yes
☐ No

33. If yes, please briefly describe this system:

Thank you for taking the time to complete this survey. The results will be collated and reported back via the ZWN website and communications.

Over the next few months we will be trialing a range of impact measurement tools with the aim of further defining a framework for shared impact measurement for the Zero Waste Network. This trial will require organisations to provide data on a range of activities and outputs and then give feedback on how easy of use, effective and appropriate the different tools were via an interview.

Participating organisations will be provided with a report of their individual impacts. The collated results will be made available to all members of the network.

34. If your organisation is interested in taking part in a trial please indicate below and Dorte will contact you to follow up.

☐ Yes, keen to be involved

If you've got any other comments or thoughts on the research please feel free to contact Dorte on dorte@zerowaste.co.nz or comment below.

Appendix 4. Briefing notes to focus group facilitators

Measuring Zero Waste Focus Group

Briefing for facilitators and note takers

Session timing:

1 hour, 11.30am-12.30pm Thursday 24th October

Session aim:

To engage ZWN member on the process of standardisation of reuse and zero waste education impact measurement reporting

Session Structure

Dorte will present a short report back on the shred impact framework project so far. This will give context to the focus groups. (15mins)

The room will be split into 4-6 groups of 6-8 people.

The groups will be based on their experience and/or interest in the following:

- Volume to weight conversion (1 group)
- Reuse categories (1-2 groups)
- Behaviour change (2-3 groups)

Each table will be given a series of questions to discuss

1. What would make a shared impact framework useful to you? (5 mins)
2. What are the barriers to adopting standardized systems? (5 mins)
3. Questions specific to each group (15 mins)

Report back (if time allows)

Facilitator instructions

At each table there would ideally be a facilitator and someone to take notes. The facilitator is the key role, so if we're short on people the note taker will be the role to go.
The facilitator will be responsible for asking the questions and keeping the conversation on topic.

Please ensure consent forms are signed to ensure this data can be used in the research.

A series of questions with allocated times will be provided for each group. A key task of the facilitator will be to keep the conversation moving, but not to direct it in a particular direction.
If it seems like the conversation is stalling or has come to an end either use the prompts or move on to the next question. Because the facilitators are all members of the network, you may all have useful things to contribute to the conversation, so feel free to take part in the conversations if you can.

Participants should be encouraged to make use of the paper and post-its on the tables as this will be an important source of data for Dorte who won't be able to be at every table.

Note taker instructions

The role of the note taker is to help with the data collection process, they are welcome to take part in the discussions also. They should note key themes, important points rather than everything that is discussed. There is no need to attribute comments to individuals - this will help with keeping the data anonymous.

Depending on the timing Dorte will get some or all note takers to report back to the group. This should focus on the main points discussed and any especially clear 'landing points' that the participants came to.

Establishing conversion factors for reusables

Introduction

Facilitator to start the session by reading this:

There is currently no standard way of establishing waste diversion for reusables. Measuring volume best represents diversion from landfill as it is the use of space, not how heavy things are that fills up a landfill. However, weight is very useful for establishing other impacts such as Greenhouse gas emissions savings. Establishing shared conversion factors may provide us a flexible and comprehensive way of talking about a wide range of impacts.

Questions

1. What would make a shared impact framework useful to your organisation? (5 mins)
2. What are barriers to your organisation adopting standardized systems? (5 mins)
3. At what part of the process does it make the most sense to record data about reusables?
4. What type of data would we capture (volume, weight or number)? (15 mins for questions 3&4)
5. Additional question if time allows: What are your suggestions for how we could establish agreed conversion factors?

Prompts

Question 3: Read out or show participants the following:

Reuse to Sale Process

1. Reusables goods dropped off or picked up off tip floor
2. Processing of reusable goods by staff
3. Goods go into shop for sale
4. Goods are sold

Question 4:

- Consider what existing systems for recording data are already in use - are some more common that others
- Consider the practicalities of recording data at different points - are there time constraints at different points in the process? What resources would be required to have tip floor, processing or shop staff record data? (eg Point of sale systems, training, inventory systems)

Reuse categories

Introduction

Facilitator to start the session by reading this:

The aim of the shared impact project is to illustrate both the challenges that we face, and the awesome work we do. We probably can't/don't need to measure everything that is reused to do this. If we're starting small, maybe we only need to focus on a few key materials/products to tell our impact story.

Questions

1. What would make a shared impact framework useful to your organisation? (5 mins)
2. What are barriers to your organisation adopting standardized systems? (5 mins)
3. What needs to be considered when choosing a shortlist of reusable products to be included in reuse impact reporting?
4. What are your suggestions for reusable product types that we should focus on? (15 mins for questions 3&4)

Prompts

Printout of categories that other networks use (eg. high volume, harm).

Discussion

- A uniform system would make it a useful tool for organisations
- Information being compiled across the country for collective impact reporting
- Barriers include
- Different councils might require different systems
- Harder at the till (taking more time and more training for staff)
- Council requirements and taking into consideration other uses for the data (eg Product stewardship)
- Ideas for product types are commonly occurring, high volume, high harm and/or pertinent to likely mandatory product stewardships schemes.

Zero waste education

Introduction

Facilitator to start the session by reading this:

The aim of the shared impact project is to illustrate both the challenges that we face, and the awesome work we do. Lots of our activities involve education and engagement and lots of these have important impacts on the people we work with. But we probably can't or don't need to measure every change that happens. If we're starting small, maybe we only need to focus on a few activities to tell our story well.

Questions

1. What would make a shared impact framework useful to your organisation? (5 mins)
2. What are barriers to your organisation adopting standardized systems? (5 mins)
3. What are the key things about our education activities that are worth focusing on?
4. Given the complexity of behaviour change, how could we capture the outcomes of our education and engagement work?

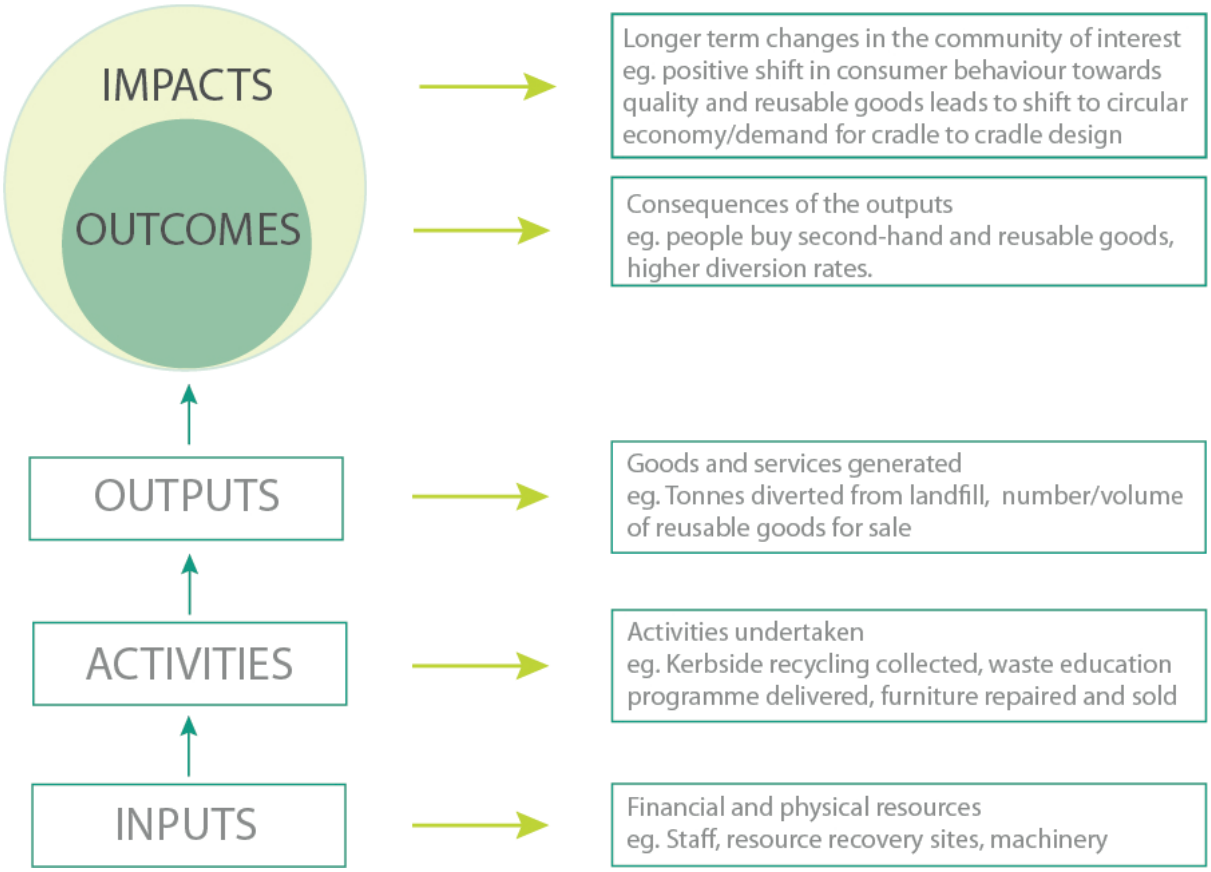
Prompts

Where zero waste education happens:

- Communications
- Education programmes
    - Workshops
    - Tours
- Events
- As part of other activities eg at the public drop off when you explain why something is or isn't acceptable

Are there any other activities where education occurs?

Consider the logic model below and the differences between outputs (often easy to measure) and outcomes/impacts (harder to measure).


IMPACTS
OUTCOMES
OUTPUTS
ACTIVITIES
INPUTS
Longer term changes in the community of interest
eg. positive shift in consumer behaviour towards quality and reusable goods leads to shift to circular economy/demand for cradle to cradle design
Consequences of the outputs
eg. people buy second-hand and reusable goods, higher diversion rates.
Goods and services generated
eg. Tonnes diverted from landfill, number/volume of reusable goods for sale
Activities undertaken
eg. Kerbside recycling collected, waste education programme delivered, furniture repaired and sold
Financial and physical resources
eg. Staff, resource recovery sites, machinery

MASSEY UNIVERSITY
TE KUNENGA KI PŪREHUROA
UNIVERSITY OF NEW ZEALAND

Human Ethics Application

Application ID :	4000020931
Application Title :	Developing and evaluating a shared impact methodology for the Zero Waste Network
Date of Submission :	03/05/2019
Primary Investigator :	Dorte Wray

Application

Initial Responses

Project Title*

Developing and evaluating a shared impact methodology for the Zero Waste Network

Campus of Chief Applicant

- (•) Manawatu
- ( ) Wellington
- ( ) Albany

Researchers

1	Surname	Wray
	Given Name	Dorte
	Full Name	Dorte Wray
	Position	Applicant
	Primary?	Yes
	Work Number	
	Email Address	Dorte.Wray.1@uni.massey.ac.nz
	Department	050
	College	50

Please add name of co researchers if unable to locate above

This question is not answered.

Recruitment / Data collection start date

06/05/2019

Projected end of the project

30/09/2020

Project Type

- ( ) Academic Staff Research
- ( ) General Staff Research
- (•) Postgraduate Student Research
- ( ) Undergraduate Student Research
- ( ) Evaluation
- ( ) Teaching
- ( ) Other

Project Summary

This research will develop, trial and evaluate a shared impact methodology for the Zero Waste Network. As such the project addresses the question: What is an appropriate and effective methodology for assessing the shared impact of the Zero Waste Network?
Based on the outcomes of a literature review, a survey of Zero Waste Network members, and interviews with a selection ZWN stakeholders, a data collection methodology will be developed and defined. Working with a sample group of ZWN members, this methodology will then be piloted over a 3-6 month period. In-depth interviews with the participating organisations after the trial period will assess the effectiveness and appropriateness of the methodology for future use.

Describe the peer review process that has been used to discuss and analyse the ethical issues present in this project.

I have researched and reflected on research ethics broadly, and discussed the main ethical issues of this research with colleagues and fellow students.

I have read and reflected on the principles and practices established in the Massey University Code of Ethical Conduct for Research, Teaching and Evaluations Involving Human Participants.

I have considered the following principles and the questions associated with each of these in Appendix One of the MUHEC code: Avoidance of harm; Benefit; Justice; Special relationships; Whakapapa; Tika, Manakitanga; and Mana. The most relevant of these are discussed in the following section.

I discussed these principles and how each of the are relevant to my research and can be addressed to ensure the quality and integrity of my research with my two research supervisors, and included an ethical considerations section in my research proposal that was reviewed by both my supervisors.

List the ethical issues considered and explain how each have been addressed

Autonomy
Informed consent will be gained from participants before they take part in the research. I will provide them with an information sheet that outlines the purpose of the study, who is undertaking the study, and how it will be disseminated and used. Participants will be given an opportunity to have their questions about the research project answered during the recruitment phase and before interviews are conducted.

Written consent will be sought from the appropriate person in each organisation for the use of organisational data.

Participants will have the right to withdraw at any time.

Confidentiality will be maintained by removing any contact details and information about identifiable individuals and organisations in the research findings unless explicit consent has been given.

Benefit, Justice and Mana
Participants and members of the Zero Waste Network, including those organisations who identify as Maori, will have access to the research findings for their individual and collective use. This research has potential to benefit Zero Waste Network members by making a significant contribution to the development of a shared impact methodology that can be utilised by the network.

Special relationships
As the Executive Officer of the Zero Waste Network I have access to important and highly relevant networks and information that uniquely enables me to undertaken this research. I will eliminate bias by having regular sessions with my supervisors, and relying on the expertise of my supervisors to challenge any potential unethical biases, alongside self-reflection.

Potential conflicts of interest will be mitigated via transparency about my dual roles as Executive Officer of ZWN and as a Masters Student to all participants and in any written reports.

With whom did you peer review your research?

My research supervisors Karen Hytten and Jonathon Hannon, colleagues from the Zero Waste Network including members of my Board of Trustees and fellow Massey University masters students.

A: Full Application

A 1 **Do you wish the protocol to be heard in a closed meeting (Part II)?***

- (●) No
- ( ) Yes

A 2 Select any MUHEC or HDEC application numbers already applicable to this application and their relationship.

This question is not answered.

A 3 **Will you be recruiting participants for your research?***

- ( ) No
- (●) Yes

B: Risk Assessment Questions

Original Risk Assessment Questions

4 Does your research include:

4.a **Situations where the researcher may be at risk of harm.***

- (●) No
- ( ) Yes

4.b **Use of a questionnaire or interview, whether or not it is anonymous, which might reasonably be expected to cause discomfort, embarrassment or psychological or spiritual harm to the participants. ***

- (●) No
- ( ) Yes

4.c **Processes that are potentially disadvantageous to a person or group, such as the collection of information which may expose a person / group to discrimination.***

- (●) No
- ( ) Yes

4.d **Collection of information of illegal behavior(s) gained during the research which could place the participants at risk of criminal or civil liability or be damaging to their financial standing, employability, professional or personal relationships.***

- (●) No
- ( ) Yes

4.e **Collection of blood, body fluid, tissue samples or other samples.***

- (●) No
- ( ) Yes

4.f **Any form of exercise regime, or deprivation. (e.g. sleep or dietary)***

- (●) No
- ( ) Yes

4.g **Any form of physical examination (e.g. physical, radiation, ultrasound).**

- (●) No
- ( ) Yes

4.h **The administration of any form of drug, medicine (other than in the course of standard medical procedure), or placebo.***

◉ No
○ Yes

4.i **Physical pain, beyond mild discomfort.***

◉ No
○ Yes

4.j **Any Massey University teaching which involves the participation of Massey University students for a demonstration of procedures or phenomena which have potential for harm.***

◉ No
○ Yes

4.k **Participants whose identities are known to the researcher giving oral consent, rather than written consent, other than for cultural reasons.***

◉ No
○ Yes

4.l **Participants who are unable to give informed consent.***

◉ No
○ Yes

4.m **Research on your own students / pupils. For Massey Staff - refer to the Decision Chart in section 2 of the Code.** Code of Ethical Conduct - Decision Chart*

◉ No
○ Yes

4.n **The participation of children (seven (7) years old or younger).***

◉ No
○ Yes

4.o **The participation of children under sixteen (16) years old where active parental consent is not being sought.***

◉ No
○ Yes

4.p **Participants who are in a dependent situation, such as nursing home or prison, or patients highly dependent on medical care.***

◉ No
○ Yes

4.q **Participants who are vulnerable.***

◉ No
○ Yes

4.r **The use of previously collected identifiable personal information or research data for which there was no explicit consent for this research.***

◉ No
○ Yes

4.s **The use of previously collected biological samples for which there was no explicit consent for this research.***

◉ No
○ Yes

4.t **Any evaluation of organisational services or practices where information of a personal nature may be collected and where participants or the organisation may be identified.***

- (●) No
- ( ) Yes

4.u **Deception of the participants, including concealment or covert observations.***

- (●) No
- ( ) Yes

4.v **Conflict of interest situation for the researcher.**
Code of Ethical Conduct - Special Relationships
Conflict of Interest
e.g. Is the project funded or supported in any way that might result in a conflict of interest, do any of the researchers have a financial interest in the outcome, or is there a professional or other relationship between the researcher and the participants? ***

- ( ) No
- (●) Yes

4.w **Payments or other financial inducements (other than reasonable reimbursement of travel expenses or time) to participants.***

- (●) No
- ( ) Yes

4.x **A requirement by an outside organisation (e.g. a funding organisation or a journal in which you wish to publish) for Massey University Human Ethics Committee approval.***

- (●) No
- ( ) Yes

4.y **I wish to submit a full application for Training / Education purposes***

- (●) No
- ( ) Yes

C: Project Details

C 1 **Aim of the project ***

This research will develop, trial and evaluate a shared impact methodology for the Zero Waste Network. As such the project addresses the question: What is an appropriate and effective methodology for assessing the shared impact of the Zero Waste Network?

In exploring how to define 'appropriate' and 'effective' in this context, additional questions will contribute to answering the main research question:
• What measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work?
• What are important practical and resource considerations that should be taken into account when designing a shared impact methodology for the ZWN?
• What methodologies and tools already exist for gathering data on impact in the CWS, and to what extent do these align with the impacts identified as important by ZWN members?

C 2 Background of the project*

Building on an earlier research project completed as part of the Advanced Zero Waste for Sustainability paper, this proposal relates to the development of a shared impact methodology for members of the Zero Waste Network.
In Aotearoa, the waste management sector is made up of public, private and community subsectors. Part of the community waste sector is represented by a peak body called the Zero Waste Network. ZWN members are small-medium organisations, often operating under a social enterprise model that ties achieving a social and/or environmental mission with trading activities.

With 50+ community members, and experience in developing and managing collaborative projects across it's membership, ZWN is well placed to take on this role, bringing together multiple parties to create a methodology that is grounded in the needs and realities of members.

Previous research and consultation with the members of ZWN have identified four broad thematic areas of impact along with some potential measures:
1. Economic Development Impacts
2. Positive environmental impacts
3. Social Impacts
4. Cultural Impacts

C 3 **Outline research/teaching/evaluation procedures including approach/procedures for collecting data and analysis.**
*If flowchart required, add to Documents section later.**

1. Literature Review
A deskbased review of academic and grey literature will be undertaken with the aim of identifying best practice impact measurement methodolgies and important issues to consider.

2. Survey ZWN members and stakeholders
A questionnaire will be developed and sent to all community members of ZWN for completion as part of ZWN annual membership survey. The questionnaire will consist of two parts:
a. Current data collection and impact measurement practices
b. Considerations for the design of a shared impact methodology

3.To ensure as many groups complete the questionnaire as possible, follow up phonecalls will be made to those that haven't completed the online form and the questionnaire may be completed over the phone.

Develop and test a shared impact methodology
Based on the outcomes of the literature review and the survey, a methodology will be developed and defined. Working with a sample group of ZWN members, a range of tools and methodologies would be piloted over a 3-6 month period. In-depth interviews with the participating organisations after the trial period will assess the effectiveness and appropriateness of the methodology for future use.

C 4 **To establish achieved trustworthiness, describe the experience of the researcher and/or supervisor to undertake this type of project. ***

I am the Executive Officer of the Zero Waste Network, a role I have held for the last seven years. This means I have an existing professional relationship with all potential participants.
I have also held several other positions that have given me relevant experience in conducting research. In particular, my role as a research assistant gave me experience in conducting interviews

C 5 **Describe the location/setting in which you will collect data? ***

I will conduct the survey online and via phone calls

The pilot will take place within participating Zero Waste Network member sites around the country and follow-up interviews will either happen in person or via video conference

C 6 **Is the location overseas?***

- (●) No
- ( ) Yes

D: Participants

D 1 **How many participants will be involved?***

Up to 55 organisations will be asked to take part in teh survey.

For the pilot and follow-up interviews I am hoping between 6-12 organisations will take part.

D 2 **Provide the reason for selecting this number or the statistical justification (if relevant).***

I think this is a realistic number of organisations to attract from within the pool of 55 Zero Waste network members.

D 3 **How will potential participants be identified?***

They will all be members of the Zero Waster Network

D 4 **How will potential participants be recruited?***

They will self-select.
The participating organisations will be chosen according to their involvement across three resource recovery activities: reduction, reuse and recycling, with 2-4 organisations participanting as representatives of each of these. An appropriate representative (member of the managerial team) from each participating organisations will sight information sheets and sign consent forms before taking part.

D 5 **Who will make the initial approach to potential participants?***

The development of a shared impact methodology is an existing project being undertaken by ZWN, so many members already know about it.
I will do the

D 6 **Does the project include recruitment through advertising?***

- (•) No
- ( ) Yes

D 7 **Does the project require permission of an organisation to access participants or information?***

- ( ) No
- (•) Yes

D 7.a **List the organisations***

Members of the Zero Waste Network

D 8 **Describe the intended participants and any specific inclusion/exclusion criteria to select participants.***

This question is not answered.

D 9 **Will you be using a screening tool?***

- (•) No
- ( ) Yes

D 10 **How much time will the participants give to the project?**
Ensure that this time matches the detail provided to the participants in the information sheet.

Survey - 15-20 minutes

Pilot

Application Detail

E: Data Collection

E 1 **Select the type of data collection.***

- [x] Questionnaire
- [ ] Observation
- [ ] Focus Group
- [x] Interview
- [ ] Other

E 2 **Describe how the questionnaire will be distributed and collected***

This question is not answered.

E 2.a **Are you distributing electronically through Massey ITS?***

- (•) No
- ( ) Yes

E 5 **Describe the location and anticipated duration of the interview, including whether it will be in work time. (If in work time, have you asked permission for this from the employer?)***

This question is not answered.

E 7 **Does your project involve sound or image recording?***

- ( ) No
- (•) Yes

E 8 **Does the project require permission to access databases?***

- (•) No
- ( ) Yes

F: Recording

F 1 **Does your project involve a non-researcher transcribing the recording***

- (•) No
- ( ) Yes

F 2 **Will you be providing participants with transcripts of interviews for editing?***

- (•) No
- ( ) Yes

F 3 **Provide justification as to why you consider that the right of the participant to edit is appropriate/inappropriate***

N/A

F 4 **If your project involves sound or image recording, describe how this will be undertaken and how consent will be given by the participant.***

Follow-up interviews will be recorded via portable voice recorder.
Consent to record will be given

G: Benefits and Risks

G 1 **What are the possible benefits (if any) of the project to individual participants, groups, communities or organisations?***

This question is not answered.

G 2 **Are participants likely to experience discomfort (physical, psychological, social), incapacity or other risk of harm?***

- (•) No
- ( ) Yes

G 4 **Is discomfort (physical, psychological, social), incapacity or other risk of harm likely to be experienced by groups/communities or institutions as a result of this research?***

- (•) No
- ( ) Yes

G 5 **Is ethnicity data being collected as part of this project?***

- (•) No
- ( ) Yes

G 6 **If participants are children / students in a pre-school / school / tertiary setting, describe arrangements you will make for children / students who are present but not taking part in the research.***

NA

H: Consent

H 1 **Who will give information about the research to potential participants?***

The lead researcher

H 2 **How will the information be given to potential participants***

This question is not answered.

H 3 **How will consent be obtained?***

- [ ] Oral
- [x] Written
- [ ] Implied
- [ ] No consent required

H 5 **Are any participants under the age of 16?***

- (•) No
- ( ) Yes

H 6 If participants include persons whose capacity to give informed consent may be compromised, describe the consent process that will be used.

This question is not answered.

H 7 **Will the participants be proficient in English?***

- ( ) No
- (•) Yes

I: Privacy/Confidentiality Issues

I 1 List any information that will be obtained from any sources other than the participant.

This question is not answered.

I 2 Identify any information that may be given to any person outside the research team that may describe participants.

This question is not answered.

I 3 **Will participants identities' be known to the researchers?***

- ○ No
- ◉ Yes

I 3.a **How will the confidentially of identities be maintained in the treatment and use of data?***

This question is not answered.

I 4 If an institution (e.g. school) to which participants belong is able to be identified, explain how you have made the institution aware of this.

This question is not answered.

I 5 **Outline how and where data will be stored, particularly identifiable data.**
Section 2: (Accessing and Sharing Data) pg 14
Appendix B: (Authorship and Ownership) pg 21 *

This question is not answered.

I 6 Outline how and where consent forms will be stored

This question is not answered.

I 7 **Outline who has access to data and consent forms.***

This question is not answered.

I 8 **How will the data / consent forms be protected from unauthorised access?***

This question is not answered.

I 9 **How long will the data be kept?***

This question is not answered.

I 10 **Who will be responsible for its safekeeping and eventual disposal?***

- ○ Principal Researcher
- ○ Supervisor (for student research)
- ○ Head of School / Head of Institute

This question is not answered.

I 11 **Will the data be transferred to an official archive or data sharing location?**
Data Sharing. pg 22
Publishing and Sharing Sensitive Data. pg 24 *

- ○ No
- ○ Yes

This question is not answered.

K: Conflict of Role / Interest

K 1 **Is the project to be funded or supported in any way?***

- ○ No
- ◉ Yes

K 1.a Identify any potential conflict of interest due to the source of funding and explain how this will be managed.

This question is not answered.

K 1.b **Select source of funding***

- ☐ Massey Academic Unit
- ☐ Massey University Fund
- ☑ External Organisation
- ☐ Not Applicable

K 1.c **Provide Organisation details.** *Name and detail of funding support**

This question is not answered.

K 2 **Do any of the researchers have a financial or professional interest in the outcome of the project?***

- ○ No
- ◉ Yes

K 2.a **How will this conflict be managed?***

This question is not answered.

K 3 Describe any professional or other relationships between researchers and the participants? Indicate how any resulting conflict of role will be dealt with.

This question is not answered.

M: Treaty of Waitangi

M 1 Describe how the Treaty of Waitangi, with reference to the principles of partnership, participation and protection, has been considered and how your research affects Maori.*

This question is not answered.

M 2 **Are Maori the primary focus of this project, or is it more than likely that participants are Maori (and ethnicity is being collected)?***

- ○ No
- ○ Yes

This question is not answered.

M 3 **Is the research topic relevant to Maori communities?***

- ○ No
- ○ Yes

This question is not answered.

N: Cultural Considerations

N 1 **Does your research focus on any ethnic or social groups (Other than Maori)?***

- ○ No
- ○ Yes

This question is not answered.

O: Sharing Research Findings

O 1 **Describe how information resulting from the project will be shared with participants and disseminated in other forums.**

Note that receipt of a summary is one of the participants rights *

This question is not answered.

3.0 Documentation

R: Documents

- Information sheet
- Draft request to enter institution document.
- Questionnaire
- Interview Schedule
- Consent Form

R 1 Using the document list below, upload or add only those documents that have been highlighted above.

This question is not answered.

4.0 Submission

Supervision

List your supervisors here*

1	Surname	Wray
	Given Name	Dorte
	Full Name	Dorte Wray
	Position	Applicant
	Primary?	Yes
	Work Number	
	Email Address	Dorte.Wray.1@uni.massey.ac.nz
	Department	050
	College	50

Others

As Chief Applicant I have read the Code of Ethical Conduct for Research, Teaching and Evaluation involving Human Participants. If there are co-researchers I have confirmed that they have read the Code and I have obtained their approval for the content of this application.
I/We understand my/our obligations and the rights of the participants.
I/We agree to undertake the research as set out in the Code of Ethical Conduct for Research, Teaching and Evaluation involving Human Participants. The information contained in this application is to the very best of my / our knowledge accurate and not misleading.
*****

☐ I agree

This question is not answered.

5.0 Sign Off

Approver

Comments for researcher.*

This question is not answered.

Appendix 6. Letter seeking permission to undertake research from ZWN Board

87 Fairview Crescent
Omiha
Waiheke Island
Auckland 1081

1 July 2019

Dear Marty,

As you are aware I am currently undertaking my thesis research and hoping to have as my topic the development of a shared impact framework for the Zero Waste Network, which will include contacting and working with members of the network on the design of an impact framework.

As part of the ethics process we have identified that in having an existing professional relationship with the participants of the research as the Executive Officer of Zero Waste Network, I have a conflict of interest. The Massey Ethics Committee has reviewed my proposal and given me provisional approval on the basis I get permission from the Zero Waste Network Board of Trustees to undertake the research, and to access the emails of Zero Waste Network members who I will contact as part of the research.

As the Chair of the ZWN Board I would appreciate your written approval for the matters above.

Kind regards,

Dorte Wray

Appendix 7: Support letters from ZWN board

5 July 2019

Dear Dorte,

The Board of Trustees of the Zero Waste Network are supportive of you undertaking your thesis research on the development of a shared impact framework for the network, and have permission to access the members database to source member email addresses.

I have provided a letter acknowledging our support of the project for you to give to members should they want it.

Yours sincerely,

Marty Hoffart
Chair
Zero Waste Network

Zero Waste Network
87 Fairview Crescent
Waiheke Island, Auckland
New Zealand 1081

P: 09 372 7289
M: 021 975 352
E: dorte@zerowaste.co.nz
W: zerowaste.co.nz

5 July 2019

Dear Zero Waste Network Member,

The Board of Trustees of the Zero Waste Network are supportive of the research that our Executive Officer, Dorte Wray is undertaking on the development of a shared impact framework for the network.

Dorte's research is investigating what measures are considered as the most important and useful for communicating the impacts of the work the network does, both individually and collectively, and what practical and resource considerations need to be taken into account when designing a shared impact framework for the network.

Dorte is doing this research as part of her Masters study, and not in her professional capacity as a staff member of ZWN. There is no obligation on members to take part in the research, however we recognise the value that the research project will have in progressing the development of a impact framework for our members.

If you would like to discuss the Zero Waste Networks role in Dorte's research project please do not hesitate to contact me, on marty@wastewatchers.co.nz

Dorte is available to answer any questions about shared impact measurement and the research project generally on dorte@zerowaste.co.nz

Yours sincerely,

Marty Hoffart
Chair
Zero Waste Network

Zero Waste Network
87 Fairview Crescent
Waiheke Island, Auckland
New Zealand 1081

P: 09 372 7289
M: 021 975 352
E: dorte@zerowaste.co.nz
W: zerowaste.co.nz

Appendix 8. Information sheet & consent form

PARTICIPANT INFORMATION SHEET

Title of Project:

Developing and evaluating a shared impact methodology for the Zero Waste Network

Researchers' name and contact information:

Dorte Wray, Massey University and Zero Waste Network
Email: dorte@zerowaste.co.nz

Purpose of the Research Project:

I would like to invite you to participate in a study exploring what a shared impact framework for the Zero Waste Network might look like.

I am interested in learning about what measures are perceived by ZWN members and stakeholders as the most important for communicating the impacts of their work, and what are important practical and resource considerations that should be taken into account when designing a shared impact framework for ZWN.

I am undertaking this research in my role as a Masters of Environmental Management student at Massey University, and not in my role as the Executive Officer. I am using a research methodology called Action Research, which applies academic research to real world problems. The outcomes of this research will be made available to the Zero Waste Network and it's members and stakeholders with the hope of contributing to the development of a working shared impact framework.

Your participation and the data collected:

If you would like to be part of this research I will arrange an interview at a time that is convenient for you. The interview will take between 45 minutes and 1 hour.

With your permission, I would like to record the interview to ensure that I accurately capture your viewpoints. All recordings will be transcribed then deleted. Transcripts will be de-identified and stored in a secure location.

All responses will remain anonymous and no participants will be identified in any way.
Participation in this research is completely voluntary. You are under no obligation to participate.

At all times you have the right:

- To ask any questions about the research
- To decide that you do not want to take part in this study
- To decide not to answer any of the questions asked
- To provide information on the understanding that your name, and the name of your organisation will not be used unless you give permission to the researcher;
- To withdraw from the study
- To decline to be recorded or to ask for the recorder to be switched off during the interview

Project contacts

You are welcome to contact the researcher and/or supervisors if you have any questions about the project.

<table>
<tr><td colspan="2">Researcher
Dorte Wray</td></tr>
<tr><td>School of Agriculture and Environment
Massey University
Palmerston North, New Zealand
Tel: +64 21 975 352
Email: dorte@zerowaste.co.nz</td><td></td></tr>
<tr><td>Supervisor</td><td>Co-supervisor</td></tr>
<tr><td>Dr. Karen Hytten
School of Agriculture and Environment
Massey University
Palmerston North, New Zealand
Tel: +64 (06) 356 9099 ext. 83089
Email: K.Hytten@massey.ac.nz</td><td>Jonathon Hannon
Coordinator - Zero Waste Academy
Massey University
Palmerston North, New Zealand
Tel: + 06 350 5016 - ex: 84810
Email: j.b.hannon@massey.ac.nz</td></tr>
</table>

If you would like to be part of this research or have any questions please do not hesitate to contact me at dorte@zerowaste.co.nz

Thank you very much for considering this invitation to take part in this research.
Dorte Wray

CONSENT FORM

I have read and understood the Information Sheet and I understand that I may ask further questions or withdraw from the study at any time.

☐ I agree to participate in this study under the conditions set out in the Information Sheet.

☐ I have the consent of the organisation I am representing to take part in this research

☐ I agree / ☐ do not agree to the interview being sound recorded.

Signature: ..... Date: .....

Full Name: .....

☐ I would like to receive a summary and/or copy of the research.

This project has been reviewed and approved by the Massey University Human Ethics Committee: Southern B, Application 19/26. If you have any concerns about the conduct of this research, please contact Dr Rochelle Stewart-Withers, Chair, Massey University Human Ethics Committee: Southern B, telephone 06 356 9099 x 83657, email humanethicsouthb@massey.ac.nz