# Growing Individuals, Growing Communities

Well-being outcomes of participating in ecological restoration and community gardening initiatives

Authors

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Māori Proverb

"Hūtia te rito o te harakeke. Kei hea te kōmako e kō?
Kī mai nei ki ahau. He aha te mea nui ki tēnei ao?
Māku e kī atu. He tāngata, he tāngata, he tāngata."

Māori

"If you were to pluck out the centre of the flax bush, where would the bellbird sing?
If you were to ask me 'What is the most important thing in the world?'
I would reply, 'That it is people, people, people'."

ACKNOWLEDGEMENTS

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PROJECT SUMMARY

Background: There is evidence that participating in environmental initiatives such as community gardens and ecological restoration has a wide range of benefits, including physical well-being, mental well-being and social capital. However, there is little evidence about how applicable this is in New Zealand.

Aim: To investigate the effects of participation in community gardens and ecological restoration projects on well-being and social capital.

Method: A review of the existing literature on the benefits of participation in community gardening and ecological restoration was conducted. A qualitative study in the Greater Wellington region was undertaken during September and October 2011. Semi-structured interviews were used to elicit the views of community garden and ecological restoration participants, as well as several stakeholders. Interviews were thematically analysed and the study groups compared.

Results: Experiences of community gardening and ecological restoration were grouped into themes related to mental health and well-being, social capital and cultural connectedness. Major emerging themes included stress relief, sense of achievement, social skills gained, community cohesion and returning to cultural roots. Cultural connectedness was a new theme that emerged, which had not been elicited in the existing literature. All themes were raised more often in the participants of community gardens compared to those involved in ecological restoration projects.

Conclusion: Both participants and stakeholders indicated that there was a host of benefits associated with community gardening and ecological restoration involvement. Participation in community gardening was linked to a broader spectrum of gains compared to ecological restoration. We propose that community gardening could be used to promote well-being for the individual and the community.

INTRODUCTION

According to the World Health Organisation (WHO), mental health is essential for the well-being and functioning of individuals and communities (1). In 2005 the WHO estimated that mental disorders made up approximately 13.5 per cent of the global burden of disease and in high-income countries such as New Zealand that burden was over twice as large. Mental disorders are an independent risk factor for all-cause mortality and there is growing evidence that they can also be linked to a number of other serious health conditions (2). Yet despite the apparent importance of mental health, as recently as 2007 the editor of The Lancet bemoaned that mental health continued to be a 'neglected aspect of human well-being' (3).

Previous research on mental health has tended to focus on the identification and prevention of mental illness (1). However, there is growing recognition that mental health is about more than the absence of mental illness; it requires the presence of positive thoughts and functioning. The implication for policy makers is that eliminating mental illness will not in itself guarantee a mentally healthy society; positive aspects of mental health need to be increased as well (4). Within the recently evolving field of positive psychology, researchers have tried to conceptualise these positive aspects in a number of different ways, using terms such as 'happiness', 'subjective well-being' and 'flourishing' (4, 5). Drawing upon evidence from positive psychology, mental health promotion is concerned with delivering effective programmes that can promote positive aspects of mental health at a population level. One of the key present challenges for mental health promotion is strengthening the evidence which informs mental health policy and practice (1).

Knowledge about the determinants of mental health is still growing, but they can be grouped into three broad categories. Firstly, there are determinants at a structural level, which include access to good housing, employment and education. Secondly, there are community level determinants such as social inclusion and supportive social networks. Lastly, there are influences at the individual level like emotional resilience and self-efficacy (6). Clearly, many of these determinants lie outside of the health sector, highlighting the need for strategies that promote mental health across a range of different sectors.

This project examines innovative ways in which mental health can be promoted among communities and individuals. Overseas studies indicate that community gardening and ecological restoration projects have positive effects that are broader than just environmental;

they have direct health and social benefits for the people involved. A number of the studies identify that, in addition to increased physical health, community gardeners report feelings of enhanced mental well-being and greater social connectedness (see table in Appendix XIII). A recent study of community-based gardening in New Zealand reported findings that are consistent with those from overseas (7). However, in New Zealand there is only a small evidence-base for the effects of community gardening and ecological restoration projects on mental well-being and 'social capital' (defined below). This project intends to try and help fill that gap, by documenting the experiences of community gardeners and ecological restoration workers. Our focus has largely been on gardens in urban communities around Wellington. The project aims are outlined in more detail below.

PROJECT AIMS

The aim of this research is to document the experiences of individuals involved in ecological restoration and community gardening projects in Greater Wellington to determine if these activities have an effect on well-being, social capital and cultural connectedness outcomes.

Research Questions:

- What is the existing literature around the benefits of participation in community gardens and/or ecological restoration?
- What are the perceived well-being outcomes for individuals involved in such projects, with a focus on mental health and well-being?
- How do community gardens and ecological restoration affect social capital?
- What are the views of stakeholders who have an interest in this area and likely to influence future development of community gardening and/or ecological restoration initiatives?

The project had the following main components:

1. Conduct a review of existing literature exploring:

   a) established associations between community gardening and/or ecological restoration projects and:

      i) mental health and well-being

      ii) social capital

      iii) other health or societal benefits

   b) established associations between social capital and mental health and well-being

   c) the history of community gardening and ecological restoration projects in New Zealand to provide a context for the significance of these activities in New Zealand communities

   d) limitations in the existing literature

2. Conduct qualitative research into the experiences of individuals involved in community gardening or ecological restoration projects in the greater Wellington region, with a particular focus on mental health and well-being, social capital and cultural connectedness

3. Identify the views of stakeholders with an interest in community gardening and/or ecological restoration projects that may presently or in future have power to effect the continuation or proliferation of such initiatives

DEFINITION OF KEY TERMS

Below, is a clarification of some of the key terms and concepts that were used in this project.

Mental well-being

Mental well-being and mental health are terms that are often used interchangeably in academic and policy literature. However, we have chosen to use the phrase 'mental health and well-being' because many people continue to perceive mental health as merely the absence of mental illness, whereas mental well-being implies more positive functioning. Mental well-being can be defined as: 'a dynamic state in which the individual is able to develop their potential, work productively and creatively, build strong and positive relationships with others, and contribute to their community. It is enhanced when an individual is able to fulfil their personal and social goals and achieve a sense of purpose in society' (6).

Social capital

As mentioned in the introduction, previous studies have indicated that community gardens have the potential to improve social cohesion and social networks among members. These social benefits are sometimes referred to as 'social capital'. Social capital is a complex concept that academics and researchers have defined in a number of different ways. We have adopted the notion put forward by the political scientist Robert Putnam, that social capital represents 'the collective value of all "social networks" and the inclinations that arise from these networks to do things for each other' (8). Putnam defined social capital as consisting of five principle features:

1. Community networks;
2. Civic engagement - use of civic networks;
3. Local civic identity - a sense of belonging and solidarity;
4. Reciprocity and norms of co-operation - an obligation to provide mutual assistance; and
5. Trust in the community (9).

As Putnam indicates, social capital is formed by people making connections with one another. The resulting solidarity enables that group to achieve things beyond what could be done if each person acted individually (10). Social capital, therefore, represents a kind of social resource, however specific links with mental well-being remain unclear (see literature review for further discussion).

Ecological restoration

The Society for Ecological Restoration defines ecological restoration as: 'the process of assisting the recovery and management of ecological integrity' (11). Restoration typically involves facilitating native plant regeneration or reintroducing fauna species to areas where they became extinct. It also involves eradicating or controlling invasive plant or animal species (11). Ecological restoration has its origins in the broader environmental movements that arose in western society around the mid-twentieth century in response to growing concerns about the damage being done to native bush and wildlife. From the 1960s, government, local bodies and community groups became involved in replanting landscapes with native vegetation (12). Today, ecological restoration in New Zealand continues to be carried out and supported by community groups, independent environmental organisations and government bodies. For example, in Wellington, the Greater Wellington Regional Council's 'Take Care' programme aims to provide advice and financial support to community groups that want to look after the environment (13).

Community gardening

Community gardens are plots of land where gardening is carried out collectively by community members, for the primary purpose of growing vegetables and/or fruit. The gardens can be situated on public or private land and resources, such as tools, tend to be shared. The gardens involve organisation and participation by citizen volunteers (14). According to Earle (7), community gardening in New Zealand can occur in a number of different forms. For example, community gardening can include community-based horticultural programmes, guerrilla gardening (when people garden without permission in public spaces) and re-vegetation projects. However, for this project we have chosen to treat the latter as 'ecological restoration'.

The cultural and historical context of community gardening in New Zealand

Community gardening has a long tradition in New Zealand. In order to provide context for our project the history of community gardening and its cultural significance is briefly discussed below. Growing vegetables was clearly an essential survival activity for both Māori and early European settlers in New Zealand (7). From the Pacific, Māori brought to New Zealand a number of important edible crops such as kumara, gourds, taro, yam and ti pore (the cabbage tree). While hunting, fishing and gathering appear to have contributed most to the early Māori

diet, gardening was a source of vital sustenance during downturns in the hunting seasons. Gardening was a collective activity that involved a large and organised investment of labour. Tasks such as clearing existing vegetation required teams of workers and may have facilitated greater social cohesion among hapū (15). According to Earle (7), gardening was an integral part of Te Ao Māori (the Māori world) and plant and harvest times were maintained through tikanga (cultural practices). Vegetable crops were grown by Māori in a number of locations throughout the North Island, including several sites in the Wellington region (7).

With the arrival of European settlers, a host of new crops were introduced to Aotearoa (16). Eager to ensure an adequate food supply, European settlers set about establishing their own vegetable gardens on New Zealand soil. Compared with gardening by Māori where work was shared by hapū, the European-style tended to involve individuals or families cultivating their own plots, although the difficulty of gardening necessitated at least some degree of co-operation and community assistance (16). Settlers also sought to recreate scenery of the English countryside by planting deciduous trees and ornamental flowers such as roses and marigolds. In Britain, Victorian style gardens were a projection of social status and in the new colony they became symbolic of the notion of 'civilisation' (16). Horticultural societies, which formed as early as the 1840s, held regular gatherings were gardeners could share knowledge, seeds and display their produce (16). Clearly these gatherings were about more than just optimising the production of food, they also served a valuable social function.

As large waves of European immigrants began to settle in New Zealand, Māori lost increasing amounts of land through sale or confiscation, thus decreasing their capacity for communal gardening. During the mid-twentieth century large numbers of Māori migrated to urban areas in search of better employment and lifestyle opportunities, which resulted in many losing touch with traditional gardening knowledge and skills (7). Today, it is estimated that approximately 84 per cent of Māori live in urban areas (17). During the mid to late twentieth century New Zealand houses were designed to allow for ornamental gardens at the front and food gardens out the back. With vegetables and fruit being grown commercially, gardening became less important for supplying food and increasingly a form of private recreation. However, during the Great Depression and World War II when vegetables shortages developed, large areas of public land were set aside for community garden plots to allow people to be self-sufficient (16).

Community gardening in New Zealand today

Today, it is not clear how many community gardens there are in New Zealand. The Auckland-based 'Gardens4Health' programme has recently indicated that they have 39 community gardens in the Auckland area (18). According to one estimate, in 2010 there were over 30 community gardens in the Hutt Valley alone (19). The vast majority of these gardens were established as community initiatives, sometimes with support from the health sector and local councils. For example, 'Gardens4Health was initially established with funding from the Counties Manukau District Health Board, but it is now financially supported by the Ministry of Health (20). In Wellington, the City Council has a policy of supporting community gardens through funding, the provision of land and providing a community garden directory (21). Māori gardening has recently undergone a resurgence, with younger generations enthusiastic to learn ways of growing traditional foods and plants for rongoa (7). Te Puni Kōkiri has established the Maara Kai initiative which aims to 'encourage Māori to revive gardening projects' (22).

LITERATURE REVIEW

In order to identify existing literature on our topic we began with a search of three databases: Google Scholar, Medline and Scopa. A multi-field keyword search of these databases was conducted using the following strategy: "communit* garden*" AND "mental health"; "communit* garden*" AND "mental well-being" (plus spelling variations of well-being e.g. well-being, well-being); "ecologic* restor*" AND "mental health"; "ecologic* restor*" AND "mental well-being" (plus the variations on well-being mentioned). Margaret Earle's (7) recent study of community gardening in New Zealand also provided a valuable list of starting references. Articles that appeared to have significance for our study were assessed and, if considered relevant, were included in our literature review. Further relevant literature was identified during the process of reading the initial articles located (via the citations). The vast majority of relevant literature that we identified related to community gardening, while there was relatively little data available on the relationships between eco-restoration and well-being. We conducted a thematic analysis of the collated articles and a discussion of our findings is presented under the relevant topic headings below. Appendix XIII summarises some of the key previous studies of relevance to our topic.

Social Capital

Although there are many different definitions of social capital in the literature, it is widely agreed that social capital is a valuable asset in a community (23). It has been linked to improvements in both physical and mental wellbeing (24, 25), resulting in improved morbidity and mortality rates (26). The mental health benefits are thought to come from an improvement in social connectedness, because it decreases social isolation and acts as a buffer for stress (14, 27). Along with the benefits to health, social capital has also been linked to improvements in social cohesion, democracy, economic well-being and sustainability (23).

Community gardening and social capital

The link between community gardening and an improvement in social capital is well established in the literature, despite difficulties in measuring social capital (these difficulties are discussed later). The studies show that community gardens serve as a "non-commercial third space" (28) where people can gather to form social networks, problem-solve and identify as a community, thus improving social capital (28, 29). Community gardens are commonly used as

neighbourhood centres where people can go to socialise, relax and exercise, all of which result in the formation of social connections (30).

King (31) identifies the relationship between community gardening and community resilience, stating that "[community] gardens contribute to community resilience by enhancing space for communication, information-sharing and deliberate co-learning, especially among diverse garden members." Teig *et al.* (32) went further to explain community resilience by describing the strength of the relationships formed within community gardens. "Gardeners look out for each other in the face of illness or difficult times. They unite to protect not only the garden but also the well-being of their fellow gardeners and that of the broader neighbourhood".

Community gardens are also noted to improve social norms such as leadership, democracy, reciprocity and mutual trust (28, 32-34). These values are important for social cohesion and are closely linked with social capital. Social interactions are a fundamental aspect of community gardening and they result in the development of these social norms. "To garden successfully, [community] gardeners must share resources, such as space, tools, and water. Cooperation is, therefore, a necessary component of the activity" (35). The idea of collective action helps to unite the gardeners and gives them a sense of community. This concept is highlighted by (35): "By making collective decisions, associational members are afforded opportunities to join a group effort, become an active member of a community, take on leadership roles, and work toward common goals".

Several studies have also shown that community gardening results in increased levels of community pride (29, 36), which improves social capital. The positive effects of community gardens on social capital diffuse beyond the neighbourhood boundaries, resulting in improvements in the wider community (32). Overall, community gardens seem to have both individual and community benefits: "Community gardens are seen to benefit the community as a whole, by improving relationships among people, increasing community pride and in some cases by serving as an impetus for broader community improvement and mobilization" (36).

Downsides of social capital

Some studies have found that social capital is generally not equally available, resulting in increasing inequalities between social groups. Lin *et al.* (37) described two mechanisms of social capital inequality: capital deficit, and return deficit. Capital deficit is "the consequence of a

process by which differential investment or opportunities result in relative shortage (quantity or quality) of capital for one group compared with another", whereas return deficit is "the consequence of a process by which a given quality or quantity of capital generates a differential return or outcome for members of different social groups". This means that social capital may result in unequal rewards for different social groups, despite the same investment (34). The social groups that have typically been affected by these deficits have been minority groups (38), so this should be taken into account with regard to Māori and other minority groups in New Zealand. Other studies have further criticised social capital by suggesting that it results in the exclusion of people who do not fit into the group and this also results in inequalities between groups (29). However, this may not be directly applicable to the social capital established by community gardening because community gardening tends to have a focus on inclusivity (7).

Social capital and mental wellbeing

The last decade has seen a surge of interest in the effect of social capital on mental health (38). Social capital is inherently difficult to measure, but several studies have claimed a link between social capital and mental well-being (39, 40). Two models have been proposed to explain this link; the main effect model and the stress-buffering model (39). The main effect model suggests that the structural aspects of social relationships (e.g. the degree of integration within social networks) protect against negative mental health states (39). In contrast, the stress-buffering model suggests that the functional aspects of social relationships (e.g. perceived social support) enhance an individual's ability to cope (39).

However, there is still much debate over the significance of the results of these studies due to both the difficulties in measuring social capital, and the complexities in establishing a causal relationship (25, 38). There is no straightforward way to measure social capital because it is multidimensional and it is very difficult to separate the constituents and the products (38). Existing studies have struggled to establish a causal relationship due to the constraints of cross-sectional and case-control study designs. Therefore, it is difficult to establish whether the lack of social connections resulted in psychological symptoms or whether the psychological symptoms resulted in a lack of social connections (38, 39). Despite these difficulties, the link between social capital and mental well-being has been widely adopted by social scientists, policy makers and institutions such as the WHO (25). Most papers agree that further studies need to be done before a causal link can be established.

Social capital and collective efficacy

Social capital has a direct effect on the collective efficacy of a community. Collective efficacy is a relatively recent concept that is used to describe group members' beliefs of the ability of their social system to function (41). In relation to community gardening, collective efficacy refers to the community members' beliefs about the social cohesion in their community and the functionality of their community as a whole. There are direct links between collective efficacy and health because it improves the community's ability to attract and maintain health-relevant services (42). It has also been shown to decrease levels of crime, as well as domestic violence and risky sexual behaviours (42). In fact, Browning *et al.* (42) found a significant difference in the overall self-reported health status of communities with high and low collective efficacies, independent of demographics. Communities with a high level of collective efficacy were found to have an 8 per cent chance of reporting ill health compared to 17 per cent for communities with low levels of collective efficacy (42).

Several factors which have a negative influence on collective efficacy are high poverty rates, residential instability and ethnic heterogeneity (43). These act to "reduce the prevalence and strength of social ties" (43) which decrease the social capital of the community. However, community gardens have been shown to reduce the negative effects of ethnic heterogeneity because they provide an opportunity for people of different ethnicities to come together around a common interest (35, 36). The health and economic advantages of collective efficacy result in improvements to the community as a whole. Therefore, social capital has both a direct effect on improving the functionality of a community, and an indirect effect by improving the community's collective efficacy.

Better nutrition

Fruit and vegetable consumption is essential for a healthy diet and common modifiable risk factor for chronic disease (44). The role community gardens play in helping to establish healthy nutrition habits amongst users has already been well documented in the literature. In the context of the global urbanisation trend, studies have discussed the benefit of urban dwellers gaining a sense of connection to food production. Community gardens provide a means to produce food locally and allow people to gain an understanding of food production (7, 45). Turner (46) concluded that at the heart of people's motivation for involvement in community gardens was a desire to produce food for themselves and their families. The commented: "this is often

expressed as part of an effort to be more engaged with the food system, at a physical and economic level" (46).

For those on lower incomes, where fruit and vegetables may be seen as a more expensive option, vegetables produced from community gardens are a way to supplement their diet (36). Participants in this Toronto-based study reported eating more vegetables because of their community garden involvement. More than half of the survey respondents in a study based in Washington also reported increased fruit and vegetable intake (47). A comparison study found higher intake of fruits and vegetables in community gardeners than in those who garden at home or do not garden at all (44). One study found that adults in a household with at least one community gardener reported fruit and vegetable consumption of 4.4 times per day, in comparison to non-gardening households who reported 3.3 times per day (48).

Community gardeners perceived their own produce to be healthier than store-bought versions, as gardeners were able to control how the produce had been grown (45, 49). Reduced exposure to pesticide residues was seen by gardeners as one of the main advantages (36). Gardeners also reported their produce as being fresher and more tasteful (45). Wakefield *et al.* (36) found that participants valued the ability to grow culturally appropriate foods that may not always be available in local shops. The desire to grow food types that may be difficult to source through more mainstream means (supermarkets or markets), was also cited in the research of Turner (46). Some members of gardens in ACT, Australia, stated that community gardens allowed them to exercise more control over their consumption patterns, removing their dependence on major supermarkets (46).

Improved physical activity levels

Gardening is considered a moderate form of exercise, and is beneficial for physical health. In their study of the Philadelphia Urban Gardening Project, Blair *et al.* (50) found that gardeners spent on average 11.7 hours per week in the garden, of which 5.6 hours were spent doing heavy work such as digging. This means that community gardeners are more likely to meet the health policy guidelines for recommended daily exercise. A study of Dutch allotment gardeners revealed that 84 per cent of the gardeners met the Dutch exercise guidelines, compared to only 62 per cent of controls (51).

In a study of a community garden in Port Melbourne participants stated that they found gardening a more interesting form of exercise than using gyms or treadmills (49). This was also reported in a study of Denver Urban Gardens by Hale *et al.* (45) where participants described the exercise as preferable "because it is a more productive and integrated form of exercise." The majority of members from Port Melbourne reported that riding a bike or walking to the gardens was an important part of their community garden involvement (49).

Reduction in crime

It has been hypothesised that the presence of green space in cities reduces urban crime rates. Brunson *et al.* (52) found that a greater number of gardens in urban settings can be linked to "fewer incidents of graffiti and other incivilities". Sullivan and Kuo (53) determined that greater amounts of green space could be linked to a reduction in the rate of domestic violence. Armstrong (33) stated that "how often city gardens and parks are frequented has been negatively correlated with local crime". Although this does not speak for the effect on the individual, it does indicate the effect on the community as a whole. When Draper and colleagues conducted a review of existing literature on community gardens, almost 20 per cent of the articles mentioned crime prevention "as either the driving force behind their formation, or as an unintended benefit once established." (54).

Education

Existing research has discussed the opportunities for learning from involvement with community gardens and ecological restoration projects. New Zealand research regarding participation in ecological restoration projects cited learning new skills or gaining knowledge as a benefit of involvement. 79 per cent of participants stated that they had developed their native plant knowledge, whilst 42.9 per cent said it helped them to develop their environment and coastal knowledge. Others also reported that they had improved their knowledge of pest species identification and control techniques, as well as seed collection and propagation (55). Overall, 65 per cent of respondents stated that they had learnt at least one skill or piece of knowledge. The majority of people agreed that their new-found knowledge or skills had positively impacted on their attitude toward the environment (55).

Watson (56) found that gardens can be an ideal setting for children's learning. She cited many domains of the curriculum that can be covered in the garden, including: literacy, numeracy,

design and technology, geography, science and environmental issues. This is in line with the theories of Montessori who believed that children learn by exploration and immersion, not merely observation: "Gardening leads children to the intelligent contemplation of nature, as well as an awareness of and appreciation for their environment" (57). When observing participation in a school garden, Rahm *et al.* (57) concluded that the gardening allowed students to create their own learning- through questions arising from their actions, rather than merely consuming the curriculum being delivered to them (57). When conducting a review of the literature discussing the benefits of garden involvement, Draper *et al.* (54) showed that the quantitative studies included in the review consistently found an increase in academic science achievement and dietary behaviour after participating in school gardening.

Mental well-being

There is a growing body of literature providing evidence for the benefits of community gardening on improving mental well-being, mood and stress relief. Studies have found that individuals can receive benefits from viewing, or coming into contact with nature. In a study by Parsons *et al.* (58) participants who were exposed to various scenic drives experienced quicker recovery from stress than those viewing artefact-dominated drives. Geist and Galtowitsch (59) found that the natural environment, whether that be a large wilderness area or a small urban green space, helps people recover from the mental fatigue often found in modern urban societies. Ulrich *et al.* (60) showed that when measuring brain activity, subjects viewing vegetation showed increased relaxation responses compared with those viewing urban environments.

The benefits that are gained from active participation in community gardening and ecological restoration appear to exceed those gained from just passively viewing nature. Several studies found the interaction with nature in community gardens relaxing and calming (36, 49, 61). The community gardens were found to provide places of retreat in urban neighbourhoods (36). Kingsley *et al.* (49) reported that "the community garden was a 'no pressure' environment where people could come together and relax as a collective rather than in isolation". Allotment gardeners in one study regarded stress relief as the most important factor for their continued participation in gardening, with 56 per cent of participants rating it as very important (51).

Greater relaxation is often considered an essential component of mental well-being (62). Community gardens have been found to be a way that participants relieve stress. In a recent study by Van Den Berg *et al.* (51), 86 per cent reported that they felt less stressed after a visit to

an allotment garden. This point was also echoed in a study by Milligan *et al.* (27) who found that recreational gardening helps relieve stress. This point is also highlighted in the study by Kingsley *et al.* (49) in which one member stated that the "garden has a lot of things going for people who are in stressful environments of today and who want to get away from these pressures". Van Eck *et al.* (63) found that stressful daily events and emotional distress have been found to significantly elevate salivary cortisol. In a recent quantitative study of 30 allotment gardeners there was found to be a 22 per cent decrease in salivary cortisol, significantly greater than when compared with the control group (11 per cent) (51). Conversely, community gardening may provide a stressful situation for participants. Some gardeners may be unable to cope with the upkeep of the garden, relying on others to do more difficult tasks, or those requiring heavy lifting (27).

Mental well-being is often reported in literature as being linked to community gardening and ecological restoration (45, 64). Mental well-being is often associated with a relaxing environment or stress relieving properties as has been mentioned above, but may also come about by other means. Ecological restoration has been found to enhance life satisfaction (65). This satisfaction was defined by a number of themes which encompass mental well-being including; aiding personal growth, improving optimism and being part of something profound. These benefits have been mimicked in a number of articles involving community gardening (45, 49, 66).

Spirituality

The available literature identifies the link between community gardening and feelings of an intimate connectedness with nature and increased spirituality. A study by Kingsley *et al.* (49) found that a community garden gave participants "a connection with the earth", as well as a sense of spirituality in their life and was viewed as a powerful experience, improving their mental well-being. In a New Zealand based study, Earle (7) noted that some participants found community gardening was a way of connecting with nature, the environment and Papatūānuku (earth mother). This improved feelings of tranquillity, fulfilment and healing. A social-ecological relationship has positive holistic health implications and improves overall well-being (45).

Self worth

Community gardeners report increased feeling of self-esteem and pride when participating in garden work (36, 54). One study reported that the development of skills in the garden improved

their self-esteem (36). Another study found that participants felt a sense of pride, joy and purpose in being part of the transformation to a gardening landscape which provides an "aesthetically pleasant experience" (45). One participant in this same study stated that there are "a lot of people who take a lot of pride in being able to come by and stuff and say 'I did this, this is mine'". Barton and Pretty (67) found that the younger participants in the study had a greater improvement in self-esteem than the older participants. Furthermore the mentally ill were found to have one of the greatest improvements in self-esteem compared to other groups in the study.

Decreased mental illness

In a prospective longitudinal study of 2,040 people investigating the risks of dementia in those over 65 years, gardening was found to be associated with an almost 50 per cent reduction in the risk of dementia when compared with non-gardeners (adjusted for age and cognitive performance) (68). The authors suggest that this result may be due to the cognitive engagement provided by gardening. However, the cognitive decline found in dementia may have prevented participants from gardening. This may have reduced the numbers with dementia in the gardening group, which may have skewed the results. Moreover, in a cohort study of 2,805 individuals over 65, gardeners were found to have a 36 per cent lower risk of dementia over a 16 year period (69). Taylor *et al.* (70) showed that interacting with nature and 'green play' improved the attention and functioning of children with attention deficit disorder. The work by Patterson and Chang (71) identifies a possible causal relationship between physical exercise, such as that gained from doing gardening, and a decrease in the rates of anxiety and depression. Armstrong (33) also identifies that community gardening may be able to address problems of depression, particularly in lower income neighbourhoods.

Challenges and negative aspects of involvement in community gardens

In the literature available, many studies have asked participants to discuss any negative aspects of their involvement in community gardens or ecological restoration projects. Common themes that emerged were theft and vandalism, social tensions, and stress. Where gardens were a communal plot (as opposed to allotments) participants spoke of feelings of stress, sometime related to a lack of control (36). Like any communal situation, gardens and eco-restoration projects are not exempt from tensions and disagreements. In the study by Teig *et al.* (32) gardeners spoke of an agreed-upon process through which to mediate issues that arose, such as when one gardener was found to be stealing produce from others.

Some gardeners reported feelings of dissatisfaction when the outcomes did not match their effort or input. Participants in a study of community gardens in Colorado indicated feelings of guilt and sadness when their plans did not follow through. Earle (7) stated that for some, gardening means too much hard work for too little gain. In terms of ecological restoration projects, Geist and Galtowitsch (59) has indicated that there can be an emotional impact from seeing human-induced destruction. Participants can feel a sense of despair at the amount of effort required to return the environment to its natural state. They concluded however, that the grief process may be helpful in allowing new understanding and passion, which can then be channelled into positive environmental action (59).

Earle (7) found that theft, graffiti and other forms of vandalism were a common problem, though generally on a small scale. In a survey of 14 NZ community gardens by Watson (56), the main problems experienced by participants were theft and vandalism. Another down-side of community gardening identified amongst participants of two studies (36, 56) related to doubts over the security of land tenure. Participants were worried that their investment in the land did not mean guaranteed future access. Van Den Berg (51) reported that allotment gardens are under increasing pressure from commercial and residential development projects.

Gaps in the existing literature

Our review of the existing literature on the mental and social effects of community gardening and ecological restoration has identified some gaps or areas where the existing evidence is scarce. The vast majority of existing evidence on this topic comes from overseas studies. There is little data available about the effects of community gardening and ecological restoration projects in New Zealand. In particular, it would be interesting to know more about the experiences of Māori community gardeners and ecological restoration workers. Our project has attempted to try and address this gap, and also to explore the possibility that community gardening could be a way to help reduce the health disparities between Māori and non-Māori in New Zealand.

In our literature review we found only one interventional study, which was conducted in Texas (72). As those participating in community gardens and ecological restoration are usually volunteers, the majority of studies are subject to sampling bias (the group sampled differs significantly from the general population). This bias is problematic in trying to establish a causal relationship between community gardening/ecological restoration and the reported benefits.

Furthermore, existing studies indicate that there is benefit in viewing or having contact with nature (58, 59), but there has been no research comparing the benefits found in these groups, with those involved in community gardening and ecological restoration.

METHODOLOGY

Sampling

The study included participants in ecological restoration and community gardens and stakeholders of these projects. A list of potential participants within the greater Wellington region was developed. The ecological restoration and community gardening groups in Appendix I were recruited in a non-systematic way through established contacts of our project supervisors. We obtained ethics approval for the project through The Department of Public Health Category B system as displayed in Appendix VI. The co-ordinator for each group was contacted by phone or email to ascertain their willingness to be part of the research project. All of those contacted were willing to participate in the study. On the project site participants were recruited through opportunistic sampling. Individual participants were approached by a student and were invited to take part in the study. The procedure was explained both verbally and with a written information sheet (App VII and IX). Written consent was obtained from all participants, apart from the child participants. In this case the teachers' approved their participation (App VIII and X). The participants were informed that they could withdraw at any point of the study.

Stakeholders were recruited from a provided list of possible stakeholders from contacts of project supervisors, interested parties and sponsors. Snowball sampling was subsequently applied, with extra interested parties recommended by the original identified stakeholders.

Methods

The data collection consisted of three main groups- stakeholders with an interest in community gardening and ecological restoration initiatives, adult participants (ecological restoration and/or community gardening) and child participants (from Greytown School, Wairarapa engaged in both ecological restoration and community gardening). The Warwick-Edinburgh Mental Well-being Scale (WEMWBS) (62), which establishes a set of population validated measures for mental well-being, was used as the basis for formatting the semi-structured interview. Prompts around social capital stemmed from the literature review. Issues around cultural connectedness were brought up in our early interviews and were subsequently incorporated into the interview format. The generic semi-structured interview was tailored to be age appropriate for the child interviews. The interview formats acted as a framework for the interviews with care taken to avoid leading or suggestive questioning.

Stakeholder interviews were audio recorded, supplemented by written notes. A set of prompts were developed based around issues we considered important in identifying the views of stakeholders to form recommendations at policy levels around community gardening and ecological restoration. Interviews took place in spaces provided by the stakeholders. These interviews involved two students with one or more representatives from the stakeholder group. Interviews were approximately 10-60 minutes long. One stakeholder was unable to meet and so responded to the questions via e-mail.

Most interviews with the adult participants were audio recorded. Some interviews were unable to be recorded due to poor weather conditions interfering with the recording devices. Written notes were taken during all interviews, with additional notes made immediately after. These interviews were on a one-to-one or two-to-one basis. Additional questions were asked about demographics in order to define our sample population.

For child participants no audio recordings were made of the interviews. Written notes were taken during the interviews and immediately following. Age, gender and ethnicity data were collected for the children. These interviews involved two researchers per group of two or three children. The interview served to investigate four main areas: the demographics of the participants, and any impacts of the community garden and ecological restoration on well-being, social capital and cultural connectedness. Pictures 1-9 illustrate these interviews and the childrens' projects.

Data analysis

Once all interviews were completed, thematic analysis was applied. Key quotations were extracted and collated under the headings mental health and well-being, social capital and cultural connectedness. A coding system was devised in order to efficiently group the data into sub-themes (Appendix XI). Using the coding system, researchers analysed their interview notes and recordings, noting the occurrence of each theme.

Picture 1: Interviewing at Greytown School

Picture 2: Interviewing at Greytown School

Picture 3: Interviewing at Greytown School

RESULTS

For this project, we interviewed adults from three different community gardens in the Wellington region: *Innermost Gardens* (Mt. Victoria), *Owhiro Bay Community Garden (Mokai Kainga)* and *Take 5 Te Whare Marama* (Wainuiomata), as well as two ecological restoration projects: *Papawai Community Trust* and *Friends of Owhiro Stream*. For details on these groups see Appendix I. Young participants (n=7) were students at Greytown School involved in the enviro-school programme of ecological restoration and community gardening.

A total of ten stakeholder groups were interviewed. There were nine Government stakeholders and three non-Government agencies. Three possible stakeholders were unable to be contacted or interviewed while two declined an interview.

Table 1 : Groups of participants and stakeholders that were interviewed

Ecological Restoration	Community Gardens	Stakeholders
1. Papawai Community Trust 2. Greytown School 3. Friends of Owhiro Streams	1. Innermost Community Gardens 2. Owhiro Bay Community Garden 3. Take 5 Te Whare Marama 4. Greytown School	1. Mental Health Foundation 2. Wellington City Council 3. Sustainability Trust Wellington 4. Ministry of the Environment 5. Operation Restore Newtown/ Inner-city Project 6. Capital Coast DHB 7. Southern Wairarapa District Council

Table 2: Sex and employment status of participants recruited

	Participants number	Percentage of Participants
Sex		
Male	13	50%
Female	13	50%
Employment Status		
Employed	11	42.3%

Unemployed	2	7.7%
Retired	1	3.8%
Volunteer Work	4	15.4%
School Student	8	30.8%

Total number of participants: n = 26

Figure 1: Age of participants
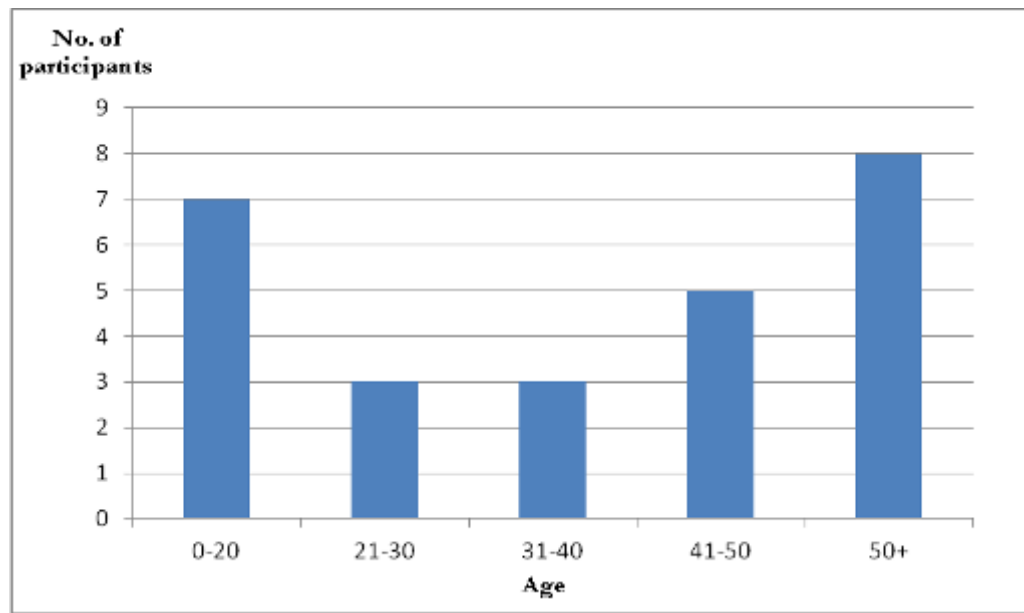
Figure 2: Ethnicity of participants
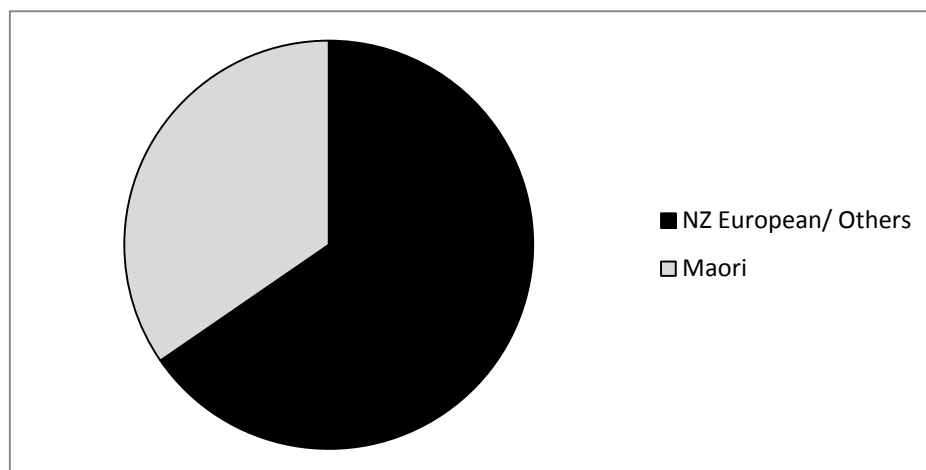
Emerging Themes and sub-themes

1. Mental health and well-being

Participants that we interviewed attributed a broad range of personal changes to community garden and ecological restoration project involvement. Some statements were holistic in nature – *"It's good for my psyche"* and *"Good for my mental and emotional well-being"*. Other points raised were more specific and we have grouped these into a number of sub-themes for the purposes of data analysis.

Engagement and interest

The category of engagement encompassed thoughts around a mental state where an individual is conditioned to interact with the world around them. Interest refers to an intrinsic motivation to make efforts towards such interactions. Points that arose from **many** participants around the themes of engagement and interest were mostly with regard to direct engagement with the community gardening or ecological restoration projects;

> *"Most of my life I have been involved in…restoration projects, kind of interested in natural environment.. It's my interest in the world really. I like the idea of working in a project in the community that I live in. Personally I was drawn to that."*

Participants also touched on how being involved in these initiatives made them more engaged or interested in other aspects of their lives. Other individuals also mentioned that they;

> *"like having a connection with food, knowing where it's from".*

One stakeholder group made mention of how engaging with gardening projects has helped individual's recovery from dark times in their lives;

> *"A real success story, she was a very heavy drinker, used to be a nurse, de-registered and now has stopped drinking, changed her career and is a chef. By coming to the gardens was part of her own recovery, participation leads to restoration and that's what helped here."*

Meaning or purpose

Themes arose from a few individuals about the project involvement giving them some purpose or "value" in life. These ideas included the way involvement in community garden or ecological restoration projects have benefits to individuals or communities beyond those benefits that are direct and tangible. One stakeholder group discussed the importance of;

> *"Networking, sharing and helping people feel like they belong to something and taking ownership of it."*

Another stakeholder reflected on the effects the project has had on individual participants;

> *"the clients started to love this programme and this was now their normality. To find that they could get up in the morning and to contribute and go towards something."*

One individual reflected on their involvement in an ecological restoration project being something positive they have done with their life;

> *"I was in prison for 23 years and so I'd wasted half of my life. I wanted to do something good in my life and by doing this voluntary job I feel better about myself".*

Self-esteem

Most participants surveyed made comments about the effects or potential for effect on self-esteem. Involvement in community gardening or ecological restoration projects was seen as a way to enhance the way individuals viewed their own self-worth, skills, potential to contribute to society and ability to achieve personal goals. Individuals talked about being;

> *"…scared before coming [to be involved in the project]"* but later having *"gained more confidence in myself".*

Many of the stakeholders explored how they saw community gardening could be of particular benefit to the self-esteem of disenfranchised people;

> *" it improves the client's [of the soup kitchen] self-esteem and self-worth".*

There were parallels drawn between the growth of vegetation and personal growth;

> *"I know there has been confidence grown".*

One stakeholder marked this as one of the most noticeable changes amongst their participants;

> *"The big thing that shone through was the self-esteem it created for the participants [referring specifically to mentally unwell individuals]. You know they were sort of rock bottom think I'm useless, feeling lousy and they get a lot of self-esteem out of it which was quite good"*

Optimism

Optimism encompasses ideas regarding a positive mind-set and the tendency to interpret given situations as likely to come to a 'good' outcome. Many adult participants explained how positive feelings from being at the garden overflowed into the rest of their life;

> *"It's a good feeling going home [after gardening] and feeling positive".*

In addition, for a few adult participants, time spent at gardening and restoration projects was seen as a break from difficulties of life;

"You can get very pessimistic about some things in the community and all the rest of it, and I feel like this is a place to be very positive".

Most stakeholders reflected on the changes they had seen amongst participants;

"showing them that they have the potential where they didn't see potential is where we were looking at. And if they got that spark or potential then they could transition into whatever they chose."

Stress relief

For many of the adult participants engaging in community gardening and ecological restoration gave them the opportunity to overcome or escape from their stressors such as work, unemployment, money, urban setting and noise. One lady explained;

"I find it relaxing, just being outside in the sun…Without it, I feel overwhelmed more easily with the busy-ness of work and the city"

Another stated;

"Being in a place like this is a reminder to slow down."

This idea of slowing down was also reflected by **one** stakeholder who commented;

"Gardening is really amazing because it slows things down a lot when you are just in the garden and doing something...it just grounds you, simple tasks that are really important and we overlook them sometimes. But for our mental well-being they are really important".

Escape from daily life

With the increase in urban dwelling and unemployment **a few** adult participants saw gardening as a chance to remove themselves from the negative aspects of normal daily life. An unemployed individual explained;

"It lets me out of the rat race"…

*"I can get away from all my ****".*

This was supported by **one** stakeholder who believed that;

"Being out in the garden and out in nature is always a good release, a place for people to go."

Sense of accomplishment

Participants had put substantial effort into making their projects successful. To see the plants growing was a wonderful feeling for **many** of them;

"There's a sense of achievement, like we grew these, and this is ours"

"Very proud of our first lettuce from the garden"

"Feeling you have accomplished something"

"The guys got the satisfaction out of knowing they had done that".

Many stakeholders witnessed that these projects had given them the opportunity to turn their place of living from a hazardous place into a tranquil and peaceful environment. A sense of pride and triumph was felt amongst them;

"It was a pretty down and out community, they got the contract and funding went into a park across the road which was a place where people went in there and drank and took drugs and smashed it up. Now it's a fantastic park that everyone is proud of".

The school children discussed a sense of accomplishment as they aimed for a better school environmental grade;

"Wanting to get to green-gold, aiming for silver".

Most of the school children had a sense of satisfaction when they harvested the vegetables they planted;

"We make soup every year from the garden it's really cool because we grew all the vegetables".

2. Social capital

Social and practical skills

The attainment of skills through the involvement in community gardening and ecological restoration was identified by a few of the young and adult participates as well as a few of the stakeholders. In referring to the skills acquired the groups described them as not only physical, but also additional qualities such as leadership.

All three groups felt like they had gained gardening skills;

"I wasn't much of a gardener before"

A few participants felt like community gardens provided a learning opportunity within the community;

> *"People learning together"*

One group of stakeholders additionally identified a broadened skill base, improved awareness and mindfulness as positive outcomes;

> *"Taita community garden involves the whole community and it is theirs, it belongs to them. But most importantly it's the education behind it. It is a holistic approach. Giving children the awareness of vegetables and nutrition. Learning basic skills and learning people skills."*

The social skills mentioned above by the stakeholders were mirrored in the other groups. One adult participant viewed it as;

> *"An opportunity to gain conversational skills"*

While one of the children said;

> *"Sometimes we talk to the other children in Enviro-groups at the other schools"*

One group of stakeholders identified that the participants learnt how to deal with difficult situations such as disputes and they learnt to be resourceful and make the best of a situation;

> *"They had to learn about conflict resolution…about their boundaries, because they've never had those sorts of rules in place"*

Furthermore a few of the stakeholders observed that the participants learnt to be resourceful and be attentive to their environment in order to maximize its utility;

> *"They learnt to look out and look at different options and be practical."*

The skills gained during community gardening and ecological restoration projects served to benefit both the individuals and the communities alike.

Community cohesion

We identified community cohesion as a recurrent theme in the dialogue with most stakeholders and adult participants. They describe community cohesion as a sense of togetherness with an emphasis on respect;

> *"Opportunity to have input (in decisions about the garden) and have that valued"*

Strengthening community networks was another aspect to their understanding of community cohesion;

> *"Community gardens are an amazing place for building community and if you know the people in your community and you do projects with them, it builds a lot stronger community, so it kind of breeds a type of resilience and community togetherness"*

Support for individuals within the group was a facet of community cohesion which was identified by a few stakeholders;

> *"It was great support, they would notice if someone didn't turn up, someone was aggressive or upset… because when they are socially inclusive we are able to see the deterioration if it happens… So this was useful in terms of well-being, intervening and preventing before they hit rock bottom. So we were sort of the cloak or korowai for supporting the people in the community"*

A few participants also cited a more holistic view of community cohesion, referring to a type of unity;

> *"It has created a sense of community and belonging"*

The increased social cohesion was also believed to be the cause of secondary community benefits;

> *"Alternative school students come over and muck around and contribute... take ownership of something. Surprisingly it (community garden) hasn't been vandalized, that is saying something. The kids don't want to ruin what they have been working on."*

> *"Gives a focus for community growth."*

Working in community gardens has given the individuals the ability to voice their opinions independent of judgment. Common ambitions and actions served to bring the group and hence the community closer together.

Building social relationships

Building social relationships was motif throughout discussions with all groups. The friendships built through participation in community gardens were seen as different to those of existing relationships;

> *"I get to meet people I wouldn't normally in day-to-day life – outside of my profession."*

The strength of relationships built in the garden came from working together towards a common goal;

> *"The best way to develop a relationship is to work alongside them"*

> *"Being with people who are keen to make a difference"*

Most participants cited the gardens as a social outlet without the barriers that they can encounter in other social circles;

> *"Socialising instead of isolating"*

A few of the young participants had a more empiric view of the social benefits;

> *"I like it because I have fun with my friends."*

> *"I've made lots of friends through this"*

From the perspective of a few stakeholders, building social relationships in terms of cultural integration was an incentive for their support of such initiatives;

> *"It started roughly 4 years ago with Innermost gardens in Newtown. It is a garden for migrant women, who meet and do an activity they all understood, help grow the community."*

One group of stakeholders viewed the social interactions as therapeutic;

> *"We wanted them to overcome their social isolation and know some of the people in the streets… social inclusion, that's one of the main issues, especially from our point of view. Social isolation leads to mental health issues, so social inclusion was helping them avoid becoming depressed… Getting involved was leading to healing themselves rather than going to the doctor and getting meds"*

Consistent amongst all groups, was the belief that social relationships are created through participation in the community gardens. These relationships were thought to bring a degree of peer support and assist in the individual's overall well-being.

Group empowerment

Most stakeholders specifically emphasized the importance of a gardening, or ecological initiative having strong support at the grass roots level;

> *"We have found it's best to be responsive to those local initiatives, rather than us trying to create them. Because if we create them, you can get local support but you won't get that same local leadership."*

> *"Own it themselves, create it and be self-sufficient in teaching others to grow their own, live off the land and that is the best resource they have in the current climate of poverty and inequality in this community"*

Community 'buy-in' was an important issue for many stakeholders. Sufficient support within the identified community for the project was viewed as one of the requirements of an application for funding;

> *"Our role is to implement and step back"*

Longevity of the projects was important to all stakeholders and they believed it relied on strong community-based support.

Expanding networks

Both adult participants and stakeholders saw the potential for community gardens to be a stepping-stone towards further community development. Many adult participants demonstrated an optimistic outlook into future expansion of current gardening practice;

> *"Together, we have the idea of kind of expanding what happens in the group by running a community arts projects. It's pretty much an integrated project."*

One stakeholder noted that involvement in the community garden had led to participants taking the initiative to branch out from, and spread their gardening skills;

> *"The clients started lawn mowing businesses."*

> *"One male heart patient took back what he had learnt to the marae, where he was a groundskeeper."*

Most stakeholders also saw it as an opportunity to reach the community and direct them to healthcare services;

> *"…a vehicle for interactions with healthcare services, a friendlier face and the ability to personally follow-up and go about continuity of care. Bonding through the garden develops common goals on a safer, more comfortable ground."*

> *"That gave them the opportunity to enter our health services … and not feel embarrassed about that"*

Community involvement in gardening/ecological restoration projects provides a basis for future community advancement.

Equality

Equality was a recurrent theme within the adult participants. They viewed gardening and involvement in restoration projects as being free from judgment and equal with their supervisors;

> *"This is neutral territory, not like at the soup kitchen"*

Participants also cited a degree of mutuality and freedom;

> *"there's a mutual respect for each other [in the community garden]"*

> *"It's an opportunity to talk on a level ground"*

This is a social environment that appears to be unique to the gardens and other ecological projects;

"The people provide a social environment and this affects people in a positive way. It does not have that exclusivity and it makes everyone feels welcome."

Reciprocity

A few adult participants enjoyed the opportunity to give their own time and energy in exchange for the benefits they have gained from supporting organizations;

"The clients are able to give something back to the kitchen"

"They were able to provide city mission with food…and feed the community. This showed that yes I've borrowed from the food bank but I've also contributed to the food bank and I feel really good about that."

It is not just about mutual benefit, but also a more holistic view of reciprocity. Not giving back to an individual or group, but openly doing something to better the community in which they live;

"I've always enjoyed this sort of (community) work"

"Giving something back to the community."

3. Cultural connections

Returning to cultural roots/returning to the land

Many adult participants, particularly those who identify themselves as Māori responded that the gardens were important to them as they saw gardening as a way of getting back to a more traditional way of life;

"It's good to get back to the land, like when I was a kid near the Marae".

A few adult participants felt that over time the land had not been cared for adequately and it was important to them that it was restored;

"Ideally we would like to get back to gathering kai and rongoa from the stream and surrounds as our ancestors did, without worrying about the pollution"

It became apparent that as well as returning to a more traditional way of life themselves the participants valued the gardens as a way of encouraging the younger generations to learn more about their culture and develop new skills.

One group of stakeholders also acknowledged the impact of urbanization on Māori health with exposure to Westernized food and a less active lifestyle. A consequence of this is demonstrated in an increase in obesity prevalence especially in the Māori population today. This further supports the importance of returning to a more traditional way of life, by getting involved in the gardens, to regain a healthier lifestyle. This was viewed within many stakeholders and adult participants;

> *"Fruit, Veges, a little bit of meat or seafood and homemade bread, that's all there was. Of course then with the great migration to the cities, things changed dramatically for us. And our bodies changed with it, with all the westernized foods"*

> *"There has been a loss of generational skills around gardening and the focus on nutrition. "We are hoping to bring in kaumātua who have that knowledge, and create a cultural connection. Recapturing the ideas of the older generation. Relearning skills."*

It seemed this was particularly important as Māori have become removed from much of their culture and through the gardens they were able to start reconnecting with their cultural roots. The gardens are a good avenue for this as it encourages group work, which is important in Māori culture as it highlights the importance of a whānau approach health initiative;

> *"It's part of my culture, you know us Māori we have collective thought"*

Enhancing cultural awareness

Cultural awareness embraces being able to understand and accept the difference in values, attitude and beliefs of other cultures. The theme of enhancing cultural awareness emerged from many of the stakeholders. They stated that participating in community gardens and ecological restoration projects can nurture cultural awareness by working with people from different cultures;

> *"They would actually get to know somebody of a different ethnicity and see that actually they did know things, and they could share just like us and they were being nice. So I think it helped to break down some cultural barriers."*

New Zealand's growing cultural diversity is demonstrated by the growing number of ethnic groups in our population as well as other groupings that individuals identify themselves with. As cited by the stakeholders;

> *" There's Somalian, Syrian, Egyptian, European, Māori, Pacific island; they were able to come together … and be in their own culture and learn another's culture."*

In order to work more effectively as a society, facilitating cultural competence by enhancing culture awareness has become more eminent than it has ever been.

Spiritual benefits

A few adult participants viewed that gardening and spirituality went hand in hand. One group of adult participants were able to incorporate their spiritual beliefs in their methods of gardening;

> *"We like to plant to the moon".*

This concept of planting to the moon is a well-established traditional technique of planting. The spiritual aspect of the idea is demonstrated in the application of Maramataka, which involves using the phases of the moon to predict the right time to plant and harvest.

One also stated that gardening brought them closer to god;

> *"A way of making a connection to god by making a connection with the environment".*

Mauri of land and environment

Mauri is defined as the life-force captured in all objects. The abstract sense of Mauri reflects the interconnectedness between our physical and spiritual aspects, integrating the ecosystems and social groups.

Mauri of land and environment was a recurrent theme within a few of the adult participants. They believed that Mauri links and inter-relates all living things within the ecosystem;

> *"Reconnecting with the earth"*

Stakeholders had the same view as adult participants on the impact gardening has on Mauri, emphasizing the holistic nature of such involvement;

> *"Papatūānuku (land) was feeding our people, in every way, the emotional, physical …"*

4. Challenges & negative aspects

The implementation of community gardening and ecological restoration programmes does not come without challenges, a range of which were raised by all groups. A recurrent theme that emerged was that of getting the wider community involved, with some participants noting that;

> *"There has been not much change in community since the project began because it does not impact on the community directly as no one has any access to it"*

Lack of involvement was explained by "difficulties in promoting the garden" and also "less public support". Our younger participants mentioned consequences of belonging to a small isolated group, noting that;

> *"Other kids who are not involved in this environment group tease us while we are going around school in our lunchtime picking rubbish up".*

As a consequence of this, often, as only small groups are involved in the running of the gardens, "you only have a few people doing most of the work, and that leads to burnout". Participants involved in coordinating the gardens, along with the stakeholders who helped organise funding for them mentioned the difficulties in delivering the "things people want" with "limited time and resources" and having to work with the council to gain approval. In essence, it takes;

> *"A lot of work to get things going initially. The maintenance is difficult and requires a really strong member of the community to take control/lead the gardening initiatives."*

Stakeholders with a special interest in Māori mentioned;

> *"We are trying to get more applications from iwi, but that has proven challenging just because of the application forms and the vehicles we use to engage with them at the moment, they (application process) are not as open and as flexible as they could be."*

Another stakeholder we met with also spoke of the difficulties in implementing gardening programmes for people with mental health issues and addiction problems;

> *"People who are highly institutionalised … lose the ability to be proactive, so if we could get people for long enough then that would be fine, but it is actually getting them to stay."*

Also, through dealing with people with criminal histories and DSM IV (Diagnostic and Statistical Manual of Mental Health, 4th Edition) disorders such as paedophilia, the issue of safety also;

> *"We have to look at if they are around females, are the females safe? Are they safe?"*

Picture 4: Founding members of Papawai Community Trust, Greytown

Picture 5: Visit to Papawai marae, Greytown

Picture 6: Ecological restoration project at Greytown School

Picture 7: Shared gardens at Greytown School

DISCUSSION

Our study investigated the effects on well-being of participating in ecological restoration projects and community gardening initiatives. From our basic research topic we identified two themes of particular interest; mental health and well-being and social capital. Our research led us to discover another theme of interest, cultural connectedness, which we included in our analysis.

The current evidence base for the beneficial effects of community gardening and ecological restoration projects is largely qualitative, with a particular scarcity of research in the New Zealand context. The existing literature contains established links between community gardening and improvements in physical activity and healthy eating behaviours. The wealth of research around these topics and the time limitations of our research led us to limit the scope of our project to the themes defined above. In addition, we did not aim to prove a relationship between social capital and mental health and well-being. The overall results of our research suggest that involvement in community gardens and ecological restoration projects benefits both mental health and well-being and social capital. A new association that we identified in our research was an improvement in the participants' cultural connectedness.

Mental health and well-being

From our research we identified several themes related to mental health and well-being. The themes were derived from the results of our interviews, whereby participants responded to prompts adapted from the Warwick-Edinburgh Mental Well-being Scale (see Appendix V). We interpreted the participants' responses to these themes as a reflection of their mental health and well-being. A prominent theme covered in the literature was stress relief. Other themes that were established in the literature were; meaning or purpose, self-esteem and escape from daily life. Additional themes that were not well established in the literature were; engagement and interest, and optimism.

Our research identified that stress relief was a benefit of participating in community gardening and this was consistent with the literature. The results from our study suggest that the participants and stakeholders felt that they played an active role in the relief of stress through participation. A slower pace and preoccupation with a simple task aided the shift in cognition away from stress-inducing rumination. The literature identified that stress relief was acquired

both actively and passively. The passive benefits are obtained through the therapeutic effects of viewing natural environments (58, 60) and immersion in nature (59).

Meaning and purpose was another theme that was mentioned in the literature. Hale *et al.* (45) established that being involved in community gardens provided participants with a sense of "pride, joy and purpose". Our research found that contributing towards something positive and having ownership over a project gave the participants a feeling of meaning and purpose, a recognised component of mental health and well-being. Therefore, we can infer that community gardening can improve participants' mental health and well-being by providing direction and stability.

The analysis of our results revealed that self-esteem appeared to be dependent on a sense of accomplishment and therefore a separation of these terms was not possible. Participants in community gardens gained a feeling of pride from the tangible rewards that they received from their efforts. This gave them a sense of accomplishment, indicative of enhanced mental health and well-being. Participants described self-esteem as an improvement in their confidence and self-worth. The literature also showed the greatest improvements in the mentally ill (67). This was supported by one stakeholder who uses community gardening as a tool to work with mentally unwell individuals. In the introduction we discussed our focus on mental health and wellbeing in comparison to mental health alone, therefore in this case we decided not to further this area of our research.

The literature and our participants both viewed the theme of escape as referring to escape from social constraints and the inherent stress of the modern social environment. The literature focused on escaping from social isolation, whereas the participants in our study viewed their time in the gardens as a relief from the stressors of daily life. This difference was a new finding and it has important implications for encouraging future participation.

A new and emerging theme that was identified during the interviews with our participants was engagement and interest. While we believe this is an important contributing factor to mental health and well-being, our participants did not appear to link engagement and interest with mental health and well-being. Due to this there is scope for further research into this area.

Participants and stakeholders believed that involvement in gardening projects was a positive community activity. Optimism was defined as a positive outlook by an individual on their life and the world. We found that they were able to channel this positivity into other aspects of their lives. This positivity affords them an element of resilience when faced with adversity (73). In contrast to the somewhat negative focus that can prevail within a community, participants noted that community gardens or ecological restoration projects provided a source of positivity.

Social capital

We identified several subthemes of social capital from our research, many of which were reflected in our literature review. The themes that we identified were; development of social skills, enhancing community cohesion, building social relationships, group empowerment, expansion of social networks and development of social norms such as reciprocity and the sense of equality.

Our research identified several previously undocumented social and practical skills which aid in the development of social capital. They were; improvement of conversational skills, conflict resolution and resourcefulness. Community gardens provide an environment that nurtures these skills which aid in the development of social connections and functioning. Therefore, we suggest that these social skills are related to improvements in social capital. The new skills gained have benefits to the individual, rendering them an asset to the community. A strong base of social skills within a community has implications for the advancement of social capital.

We identified some unforeseen secondary benefits of community gardening, which were related to the improved sense of safety within their community. A few stakeholders spoke of a reduction in vandalism and this view was confirmed by the literature (52). One study found that there were "fewer incidents of graffiti and other incivilities" in areas with a green space (52). Further research expanded this finding to encompass an overall reduction in crime in areas undertaking community gardening initiatives (14, 33, 54) and this was briefly mentioned by some of the stakeholders we interviewed.

Social connectedness is an essential aspect of social capital and it was identified both in our literature review and our research. Glover *et al.* (28) infers that working towards a common goal helps to unify the group, leading to a feeling of inclusivity. This extends further to a unity of the community where the members can provide support to others in times of hardship. Some of our

participants addressed this issue, saying that they had noticed that the gardeners looked out for one another.

Participating in community gardens gives individuals the chance to have a say in the decisions regarding the garden. In addition, this has the potential to create opportunities for members to develop leadership qualities (a recognised component of social capital). This improves social cohesion and social support, creating an environment of safety and respect in which group members are allowed freedom of expression.

Participants highlighted that involvement in gardening activities created an opportunity for them to build social relationships and broaden their social circles. The development of these relationships has a direct effect on social capital. This concept has been established by several studies which demonstrate the connection between community gardening and the formation of new relationships (28). Teig *et al.* (32) developed this idea further by describing an improvement in the resilience of the community due to the relationships formed in community gardens. This was consistent with one of our stakeholder's views who noted that "because they are socially inclusive we are able to see [a] deterioration…so this is useful in terms of…intervening and preventing, before they hit rock bottom."

Our study also showed that participation in the gardens was viewed as a social outlet and in some cases an avenue to overcome social isolation. One stakeholder linked this social isolation to mental health and health issues and therefore it shows how gardening can be used as a therapeutic tool to improve mental health and well-being. This relationship between social isolation and mental health and well-being is one of the proposed mechanisms of how social capital can have a positive effect on mental health and well-being.

The literature touches on the theme of group empowerment, whereby joint decisions bring the group together, improving their collective efficacy (28). Stakeholders mentioned the theme of group empowerment more than the other groups. They also viewed the development of leadership and direction within the groups as important for the sustainability of these projects. Most stakeholders viewed their role as solely supportive and therefore empowerment of the group improves that group's ability to become self-sufficient, a crucial requirement for the success of these initiatives.

Equality was a common theme that was mentioned by the participants in our study. The adult participants cited that the gardens provided a neutral, non-threatening environment. This catalysed the formation of new relationships, as well as strengthening existing relationships. This mechanism of promoting equality was not covered in the literature. Instead, the literature referred to equality in relation to cultural competence. Wakefield *et al.* (36) discussed the way that community gardens can increase awareness of cultural diversity. Furthermore, Tieg *et al.* (32) described community gardens as a potential "change agent" in the fight to reduce inequalities. This has particular implications for Māori in the New Zealand context. Reduction in inequalities leads to a level standing in society which encourages the development of social capital.

Reciprocity is a social norm that is mentioned in the literature as an important value contributing to social capital (33). We found that our participants had several different personal definitions of reciprocity, which ranged from repaying the generosity that other gardeners showed, to the broader idea of giving back to the environment. For the purpose of our analysis we used the idea of reciprocating positive actions because this contributes to the productivity of the community and it helps to strengthen the interpersonal relationships. Therefore, it has a direct effect on social capital.

We found that the social capital that is formed from community gardening expanded beyond the boundaries of the gardening groups themselves. Relationships that were formed during the gardening initiatives were able to reduce some of the barriers that can restrict people from accessing healthcare. A few stakeholders mentioned that their support of the community garden initiatives fostered trust between the participants and healthcare providers. It is widely believed that lack of trust in the healthcare system is a barrier to access. Therefore, the development of community gardens can have implications for improving the health status of our population and reducing inequalities by encouraging equal access.

Cultural Connectedness

Our interviews revealed cultural connectedness as **an additional** benefit of community gardening, however there is no existing research in support of this link. Recurrent themes we identified as portraying the idea of cultural connectedness were returning to cultural roots, enhancing cultural awareness, spirituality and the mauri of land.

Participants and stakeholders viewed returning to cultural roots as an important benefit resulting from their participation in community gardening and ecological restoration projects. Involvement in these initiatives facilitated a return to their traditional way of life, which participants perceived as a healthier way of living. The benefits are therefore two-fold, both improving the health status of participants and allowing a rediscovery of cultural roots.

This rediscovery motivated participants to consider the importance of disseminating their new found knowledge to the tamariki, and hence to future generations. Community gardens were seen as a medium to promote education and maintain cultural integrity.

Many participants referred to the changing world and the resultant effects upon their culture. Foremost was the issue of the urbanization of Māori and the follow-on effects, such as a change in both their diet and surroundings. Another example of the changes to their world that we noted was the depletion of the natural resources due to a variety of causes, such as pollution. This was evident during our interviews at the Papawai Stream. The effects of urbanisation and resource depletion hinder the ability of Māori to return to their former fundamental cultural practices, namely living off the land. Community gardening and ecological restoration allow for individuals to return to cultural roots whilst simultaneously retaining their cultural heritage.

A few stakeholders mentioned how the community gardens provided a mutually appropriate environment to learn about other cultures. This facilitated an improvement in cultural competence through enhanced awareness of the values and beliefs of other ethnic and social groups. Participation in gardening enabled integration within the communities. Long-term benefits of this integration may have a follow-on effect on cultural cohesion and a reduction in inequalities. We suggest that further research is required to prove this hypothesis.

An adapted model of health in New Zealand is Te Whare Tapa Whā (74), a holistic approach to health encompassing four domains; Taha Tinana (Physical well-being), Taha Whanau (Social well-being), Taha Hinegaro (Mental well-being) and Taha Wairua (Spiritual well-being). Of these domains, we think Taha Wairua is an important but frequently neglected component. Some of our participants saw the gardens as another means of connecting to their god. A few Māori participants used gardens to employ traditional spiritual practices, such as Maramataka (gardening according to the position of the moon, in the belief of a larger harvest).

In the Māori holistic view of the world, whenua (land) and its mauri are intrinsic to every aspect of life. Māori believe that a strong physical and spiritual relationship with the land is fundamental to their ability to maintain their cultural identity. Participants thought that community gardens provided an opportunity to reconnect with the land. The engagement provided by community gardens, and to a lesser extent through ecological restoration, served to nurture these cultural ties.

Challenges to involvement

In conducting our research we considered possible impeding factors to individual or community involvement in projects. We thought this was important in order to gain a complete understanding of the factors influencing the success of community gardens and ecological restoration projects.

Challenges were identified by all groups within our study, although the types of challenges varied. One of the challenges that community gardens or ecological restoration projects face is a difficulty in promoting these projects to their respective communities. This meant that the burden of responsibility rested on a small number of individuals. Some of the child participants experienced barriers to participation in environmental groups due to social stereotyping.

Stakeholders mentioned their limitations regarding resources and time as being a major barrier to their ability to meet the demands of the community groups. Stakeholders also identified the protracted application process as a potential barrier. Iwi was a specific group that was identified.

One stakeholder organisation used community gardens to rehabilitate members of the community who suffered from mental illness and addiction. In this instance there were concerns about the safety of other participants, therefore consideration of the risks posed by the various criminal and psychological profiles of particular participants was required.

Whilst the challenges discussed above reflect a moderate barrier in isolation, the culmination of these factors could hinder the progression of community garden and ecological restoration projects.

Community gardening versus ecological restoration

As our project progressed we noted some interesting differences between community garden participants in comparison to those involved in ecological restoration. (Refer to App XIV)

Themes that were equally identified by the two groups were engagement and interest, building social relationships, cultural awareness, spiritual benefits and the mauri of the land.

There were several themes that were raised predominantly by one group compared to the other. Community garden participants mentioned the themes of self esteem, stress relief, a sense of accomplishment, social skills, community cohesion, equality, reciprocity and returning to cultural roots more frequently. Ecological restoration had a greater association with the theme of expanding networks.

Some themes were brought up solely by one group. Within mental health and well-being, optimism and escape from daily life were themes only discussed by community garden groups. In contrast, meaning or purpose was only mentioned by ecological restoration groups. In terms of social capital, group empowerment was only raised in ecological restoration groups.

A plausible explanation for the stronger relationship between ecological restoration projects and gains in group empowerment may be that the outcomes of the group's efforts served to benefit the wider community. This is in comparison to some community gardens where outcomes can remain quite localised.

All three themes; mental health and well-being, social capital and cultural connectedness were elicited to a greater degree in the community garden groups. This highlights an interesting contrast and suggests that community gardens have the potential to provide greater gains compared to ecological restoration projects.

The relationship between community gardening and these overall gains appears to be quite complex and we could not draw any concrete conclusions from our research. Further research is required to prove this link.

Limitations

During our research, we encountered several key limitations. These impaired our ability to gain a complete insight into the field of interest. A common problem was the reluctance of participants to elaborate on the area of mental health and well-being when it was encountered during participant interviews. A plausible explanation for this is the prevailing societal confusion of the terms mental health and well-being and mental illness. The personal nature of experience with mental illness meant that participants were reluctant to disclose this information during our interviews. We avoided further drawing out this type of information.

Interviews were conducted on days when participants were actively working on projects. This resulted in a mismatch between our intentions as researchers and the participants' prerogatives to continue working on the project. In addition to this, we attempted to audio record all interviews, but resource and weather limitations restricted our ability to do so. This meant that the recording of key themes was done retrospectively and could have resulted in loss of information.

Another limitation was the potential for recommendations of our study to have been percieved to have implications for future funding of these initiatives. Therefore, participants may have been overly positive in their comments regarding community gardens and ecological restoration projects. We think this could be due to their vested interest in ensuring a positive set of outcomes from our study.

The fact that our interviews were conducted by 11 researchers has inherent limitations surrounding the variability in the style of interviewing. We utilised a semi-structured interview format and therefore to direct discussion we chose to cue the participants with prompts. This may have led to over-reporting of certain themes.

Selected content of the interviews was transcribed based on the importance of each quote as judged by individual researchers. This independent judgement possibly led to the loss of quotes relevant to the later developed themes. This may have underestimated the relationship between our three key areas (mental health and well-being, social capital and cultural connectedness) and these environmental initiatives. Incorporating interviewer training and reducing the number of interviewers could address the above limitations.

The time restrictions of our project, wet weather conditions and the delayed response from stakeholders resulted in a reduced sample size. Despite this, the qualitative nature of our study enabled us to identify a substantial number of themes.

Further limitations to our sampling process resulted from the provision of a set of predetermined community gardens, ecological restoration projects and stakeholders from which we drew our sample. This limited the scope of participants and stakeholders identified, which may have influenced our results.

Picture 8: Community garden at Papawai marae

Picture 9: Monday morning at Owhiro Bay community gardens

IMPLICATIONS FOR THE FUTURE

Many of our stakeholders mentioned that a quantitative research approach would be helpful to them in terms of measuring outcomes and therefore in their justification of funding. As we have already established this area of research is new, therefore our qualitative and exploratory approach served to identify possible causal links. A quantitative survey of the aspects of this research could be developed based on the recurrent themes identified by our study. The results from this could be extrapolated to inform the decisions of stakeholders as mentioned above.

Another recommendation is for the development of a collaborative network of stakeholders to expand the scope of community gardening and ecological restoration projects. The current situation is that individual stakeholders have their own funding and a complicated application process. This separation of stakeholders has proven to be a barrier to participants accessing funding and support. A collaborative effort would not only provide a foundation for increased support for these initiatives, but also create a smoother pathway, thereby increasing public awareness and participation.

Mental health and well-being is a complex issue within the healthcare system, with limited therapeutic interventions at the health professional's disposal. Non-pharmaceutical options are currently limited. In view of the wide continuum of mental illness, an alternative treatment (e.g. participation in community gardens) has potential to be beneficial to those who are situated earlier on the continuum. In addition to this, those already on medication for their mental illness may be able to reduce their current dosage. Further research around this dose-response relationship is required to prove this hypothesis.

As we have established earlier in this discussion community gardens and ecological restoration projects have provided a gateway to other health initiatives. This was particularly apparent in our Pacific and Māori participants, who were seen to have increased utilization of health care services when involved with these initiatives. The reciprocal of this is that health services can use these community networks to make contact with previously unrecognised patients. Further to this, when healthcare services are seen to support community initiatives it fosters trust and partnership between the public and the health sector. Therefore community gardens can be useful in the provision of healthcare.

Our research appears to have identified participation in community gardens has a greater benefit to mental health and well-being compared to ecological restoration projects. It is for this reason that we are recommending community gardens as a potential intervention. Implementation of community gardens is relatively cheap, estimated at a one-off payment of $18 per participant by a district health board representative. In addition to this, community gardens are generally self-sufficient and therefore very little maintenance is required.

The Green prescription is an established tool available to all New Zealand general practitioners. (See *http://www.health.govt.nz/our-work/preventative-health-wellness/physical-activity/green-prescriptions*, a Ministry of Health website outlining the purpose of the Green prescription). We identified that community gardens would follow the same objectives of the Green prescription; endeavouring to provide non-pharmaceutical interventions, with the aim of improving the health of New Zealanders. We propose that community gardening is included as a component of the existing green prescription. We envisage that General Practitioners will utilize this extension to the green prescription as an additional therapeutic tool in their treatment of mental illness.

We suggest that a pilot study into the benefits of implementing a community gardening initiative as an addition of the Green prescription is conducted to test the effectiveness of this proposal.

CONCLUSION

Our results indicate that participants in community gardening and ecological restoration projects experience a number of benefits through their involvement. The most common benefit reported by interviewees from Wellington-based community garden and ecological restoration groups was that of enhancement to aspects of mental health and well-being. In particular, themes of well-being that were mentioned by interviewees included feelings of optimism, increased self-esteem, reduced stress and a sense of engagement and purpose. Individuals and stakeholders interviewed also expressed views that indicate community gardening and ecological restoration projects contribute to social capital. A number of interviewees stated that these activities help bring communities together, create a sense of equality and enable people to build social skills and forge new relationships. Some interviewees also saw involvement in community gardens as a way for people to get back in contact with culture and traditional ways of doing things. We have called this benefit 'cultural connectedness'.

Although both community gardening and ecological restoration projects had benefits for participants, our results suggest that the former offers a broader spectrum of health and social gains. Our findings offer support for the notion that community gardening initiatives may be implemented or supported as a public health intervention or as a 'green prescription'. According to the existing literature, community gardens provide an affordable way for people to access fresh fruit and vegetables, as well as providing a source of exercise. Our research has indicated that there are additional benefits in terms of improved mental health and well-being, a healthier functional community and facilitating development of cultural identity. Further studies, including quantitative studies, are required to estimate the extent of these gains.

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Appendix I: Description of groups

Ecological restoration/community gardening group	Profile
Papawai Community Trust (Ecological restoration)	The Papawai Community Trust is a marae-based group, formed in 2004, whose aim is to restore the mauri (life-force) of Papawai Stream and the health of connected waterways. In addition to regular re-vegetation planting and clearing invasive weeds along the river and its banks, the Trust attempts to protect the stream from threats such as nutrient runoff from surrounding farmland. In 2010, the Trust received several sources of funding including grants from industry and from the WWF-New Zealand for their stream care project.
Greytown School (Ecological restoration and Community gardening)	The Greytown School established a garden club, as part of the Enviroschools network, to encourage their school children to engage in nature-centered activities such as growing their own vegetables and participate in the Papawai ecological restoration efforts. The club members meet twice a week and work on fund raising, planting and harvesting throughout the year. Once a month, the club will join other club gardens from neighbouring schools to work on the Papawai Stream.
Friends of Owhiro Stream (Ecological restoration)	The Friends of Owhiro Stream are a community group, formed in 2003, with the overall goal of restoring and protecting the stream's health (Friends of Owhiro Stream, 2011). The Friends of Owhiro Stream have focused most of their work along the stream's upper reaches, where they have cleared pest plants and planted thousands of native trees. The group holds regular working bees and planting days (during planting season), which sometimes involve local school children and other community members.
Innermost Gardens	An incorporated society established in 2009 who describe themselves as a 'multicultural group of people working in community gardens to learn from one another and move toward a healthy, more sustainable future' (Innermost Gardens,

Ecological restoration/community gardening group	Profile
	2011). The group has two gardens, one in Mount Victoria and another in Newtown, although only members of the Mount Victoria garden were approached.
Owhiro Bay Community Garden	Established as a joint venture between Mokai Kainga Māori Trust, Wellington City Council and the Department of Corrections. There was also input from other groups such as Friends of Owhiro Stream. Sitting on a sunny site of around one acre, Owhiro Gardens has plots available to families as well as a large plot used by a soup kitchen. Clients and staff from the soup kitchen in Wellington are brought to the site to garden one day a week. The vegetables are then taken back to the soup kitchen.
Take 5 & Te Whare Marama	A Hutt initiative for mental health consumers promoting "creative living for mental health". This service is based in Wainuiomata. Mental health consumers, their family, friends, support people are welcome to attend. The main aim is to empower people with mental health needs focussing on their strengths, abilities and potential. This is done by providing programmes that respond to the needs of participants including community gardening.

Public health project: "Well-being outcomes of participating in ecological restoration and community gardening initiatives"

Project participation:

1) Can you tell me the story how you became involved in the project? (Might need to name it)

    Prompts   (if doesn't come up in open-ended question)
    What were the main reasons? you joined the project?
    a. How you got involved?
    b. Why you got involved?
    c. How long have you been involved?

2) How often do you participate in the project?
3) Tell me the kind of things you do?
    a. Prompt   What is your role in the project?
4) Are the reasons for initially joining the project, same reasons as why you stayed involved?
5) Does it cost you anything to get involved?

Community impact

Now I'd like to ask you what impacts the community garden has had on you?

1) Could you tell me, how you feel about the project?
2) Have you noticed any changes about how you felt about things since you have joined the project?
3) Has anything in your life changed since getting involved in the project?

Social capital

Now I'd like to ask your opinion about the impact of the community garden on the local community.

1) Have there been any changes in the group involved in the project as time has gone on?
2) Have you noticed any changes in the community since the project began?
3) Do you think the group has had any effect on the general community in this area?
4) Does the group involved in the project meet outside the garden settings?
5) Can you tell me how people in the garden project get on?

Demographics (personal questions should always be at the end)

1) Now I'd like to ask you a few quick questions about yourself.
2) -Age group
   -Sex
   -Suburb/area you live in
   -Ethnicity (self-identified)   Can you tell me what ethnic groups you identify with?
   -Employment
3) Are you in the paid work force?

4) FT/PT?
5) Retired
6) Occupation (present or last)

Appendix III: Child participant prompts

Hi, I was keen to talk to you about the work you and your class do in the stream (Should name it for them too)

1)How often do you go to the stream?

2)Tell me what you do in the stream when your class goes down there?

3)Do you go down by yourself or with your friends ever?

4)What do you do in the stream?

5)What have you done at the stream?

6)What do you like about it? Is there anything you don't like?

7)What's the best thing about going to the stream?

8) Have you learnt anything about nature? Do you have a garden at home?

9)Do you get involved in the garden?

10)Do the adults in your family garden?

Demographic

1)How old are you? Where are you from? Where do you live?

Ask the teachers what changes they have noticed from working on the project.

Appendix IV: Stakeholder prompts

1)Could you tell us about your organization and its objectives?

2)Could you tell us about any experiences you have had with community gardens/ecological restoration?

3)Could you talk about the points of attraction for supporting these projects?

4)Could you describe any positive outcomes from community gardens/ecological restoration?

5)in our research, we are looking at potential benefits to mental well-being and social capital from participating in these projects. How do these fit in with the objectives of your organization, if at all?

6)Could you tell us about any barriers that you have encountered in regards to supporting these projects?

7)Could you describe any negative outcomes from community gardens/ecological restoration?

8)Are there any particular outcomes from our research that you would like to see?

The Warwick-Edinburgh Mental Well-being Scale (WEMWBS)

Below are some statements about feelings and thoughts.

Please tick the box that best describes your experience of each over the last 2 weeks

STATEMENTS	None of the time	Rarely	Some of the time	Often	All of the time
I've been feeling optimistic about the future	1	2	3	4	5
I've been feeling useful	1	2	3	4	5
I've been feeling relaxed	1	2	3	4	5
I've been feeling interested in other people	1	2	3	4	5
I've had energy to spare	1	2	3	4	5
I've been dealing with problems well	1	2	3	4	5
I've been thinking clearly	1	2	3	4	5
I've been feeling good about myself	1	2	3	4	5
I've been feeling close to other people	1	2	3	4	5
I've been feeling confident	1	2	3	4	5
I've been able to make up my own mind about things	1	2	3	4	5
I've been feeling loved	1	2	3	4	5
I've been interested in new things	1	2	3	4	5
I've been feeling cheerful	1	2	3	4	5

Form Updated: February 2011

HUMAN ETHICS APPLICATION: CATEGORY B
(Departmental Approval)

1. **University of Otago staff member responsible for project:**
   Dr Paul Blaschke,
2. **Department: Fourth Year Medicine Public Health Group**
3. **Contact details of staff member responsible: paul.blaschke@otago.ac.nz**
4. **Title of project:** Well-being outcomes of participating in ecological restoration and community gardening initiatives.

5. **Indicate type of project and names of other investigators and students**:

Staff Research   **Names**

| **Student Research**   **Names** | 4th year medical students Public health group B1 |
| *Level of Study (e.g. PhD, Masters, Hons)* | |

| **External Research/**   **Names** **Collaboration** *Institute/Company* | 4th year medical students |

6. **When will recruitment and data collection commence?**
   Recruitment commence- 19th September 2011

   Data collection- 24th September 2011

When will data collection be completed? 21st October 2011

7. **Brief description <u>in lay terms</u> of the aim of the project, and outline of research questions**
(approx. 200 words)**:**

The aim is to document the experiences of individuals involved in ecological restoration and community gardening projects to determine if these activities have an effect on well-being and social capital outcomes.

Research Questions:

- What is the existing literature around the benefits of participation in community gardens and/or ecological restoration?
- What are the perceived wellbeing health outcomes for individuals involved in such projects, with a focus on mental well-being?
- How do community gardens and ecological restoration affect social capital?
- Case report: community garden in very low SES area vs community gardens in central Wellington
- What is the role of restoration and gardening in helping urban Māori reconnect with their iwi, hapū or marae and increase their understanding of mataurange Māori and/or tikanga Māori?
- Identifying the views of stakeholders who are likely to have an interest in this area and influence they have on future development of such initiatives.

8.   Brief description of the method. Please include a description of who the participants are,   how the participants will be recruited, and what they will be asked to do:-

The project will include three groups of participants. Firstly, members of community garden groups and ecological restoration groups. (Papawai Community Trust, Innermost Community Gardens, Owhiro Bay Community Gardens). Supervisors have contacted these groups to gain consent for their participation. We will be getting in contact with the supervisors and attending events they have organised such as working bees at community gardens and visiting the Papawai community trust at an allocated time. On these occasions, our method will involve conducting direct participant observations by deriving an ethnography approach.

Our participants will be recruited by opportunistic sampling at these organised events. We will obtain their consent through a written consent form during our fieldwork.

Participants will be asked to take part in an informal semi structured interview to explore the themes mentioned later. We will distribute information sheets outlining the details of our study. Attached to this information sheet will be a written consent that participants will have to sign before we interview them.

Secondly, we will also be holding a discussion with children ages 7-12 who are involved in the Papawai Community Trust ecological restoration project. In these circumstances, the written consent for interviews with school children will be obtained from teachers as a proxy for written parental consent. A teacher will be present throughout the discussion and will help explain the project to the children. The school has agreed to the procedure.

Thirdly, to identify the views of stakeholders, we have contacted various organisations that are relevant to our project. These stakeholders are working mainly at the local/regional level. We will arrange face-to-face meetings with them to carry out semi structured interviews.

The general line of questioning in the interviews and discussion will be the impact working in a community garden or ecological project on well-being. For example, areas such as motivations for being involved and remaining involved in the project, changes within themselves that have come from being involved, impact of the project on their community and members of their group, and the role of such projects in helping individuals connect with their culture, may be explored.

All interviews except for the interviews with the children will be recorded digitally. We plan to hand record the data we gather from the children. All participant details will be kept confidential. The recordings and any other gathered data will be stored in a secured area while we analyse the results for qualitative themes. All recordings will be destroyed at the end of the research period.

9. **Please disclose and discuss any potential problems**: (For example: medical/legal problems, issues with disclosure, conflict of interest, etc)

No particular ethical issues are anticipated. The interviews and discussion will not cover any sensitive areas or issues likely to cause any discomfort or distress. Participants will be reminded of their right to withdraw from the project at any time if they are not comfortable with any aspect of the interview.

We will not obtain written consent for children, due to their young age. Instead a teacher from the school will take on the role as *loco parentis*, and we will clearly explain the details of the project and other fine print details that will ensure they understand the implications of participating this study.

Applicant's Signature: ....

*(Principal Applicant: as specified in Question 1, Must **not** be in the name of a student)*

Signature of *Head of Department: ....

Name of Signatory (please print): ……………………………………………………….

Date: ....

Departmental approval: *I have read this application and believe it to be scientifically and ethically sound. I approve the research design. The Research proposed in this application is compatible with the University of Otago policies and I give my consent for the application to be forwarded to the University of Otago Human Ethics Committee.*

*(In cases where the Head of Department is also the principal researcher then an appropriate senior staff member in the department must sign)

IMPORTANT: The completed form, **together with copies of any Information Sheet, Consent Form and any recruitment advertisement for participants**, should be forwarded to the Manager Academic Committees or the Academic Committees Assistant, Registry, **as soon as the proposal has been considered and signed at departmental level**. Forms can be sent hardcopy to Academic Committees, Room G23 or G24, Ground Floor, Clocktower Building, or scanned and emailed to gary.witte@otago.ac.nz.

Well-being outcomes of participating in ecological restoration and community gardening initiatives.

INFORMATION SHEET FOR PARTICIPANTS

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What is the aim of the project?
This project is conducted as part of a fourth year medical student public health project. The aim is to document the experiences of individuals involved in ecological restoration and community gardening projects to determine if these activities have an effect on well-being and social capital outcomes.

What will participants be asked to do?
Should you agree to take part in this project, you will be asked to participate in an informal face–to-face interview to explore the themes as outlined below. The interview will be more like a conversation rather than a set list of questions.

What data or information will be collected and what use will be made of it?
The general theme we would like to explore involves the impact working in a community garden or ecological project has on your mental well-being. For instance, areas such as your motivations for being involved and remaining involved in the project, changes within yourself that have come from being involved and your perceived impact of the project on the community and members of your group, may possibly be explored.

In the event that the line of questioning does develop in such a way that you feel hesitant or uncomfortable you are reminded of your right to decline to answer any particular question(s) and also that you may withdraw from the project at any stage without any disadvantage to yourself of any kind.

All interviews may be digitally recorded and later used for transcription. We may use part of the interview in the final report and presentation. There will be no mention of your name. The data collected from these interviews will be analysed for emergent themes and subthemes.

The data collected will be securely stored. At the end of the project the recordings and information will be destroyed.

The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but your anonymity will be preserved.

We invite you to attend our research presentation on the 21st of October 2011, 10.30am at the Wellington School of Medicine, Mein Street, Newtown (level D).

What if participants have any questions?

If you have any questions about our project, either now or in the future, please feel free to contact:-

Dr Paul Blaschke (Supervisor) paul.blaschke@otago.ac.nz

Appendix VIII: Adult participant consent form

Well-being outcomes of participating in ecological restoration and community gardening initiatives.

I have read the participant information sheet and understand the process for the interviews.

All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:

- my participation in this project is entirely voluntary

- I am free to withdraw from the project at any time

- the exact interview questions will depend on the way the interview develops. If I am uncomfortable with any of the questions I can chose not to answer that question or ask for the interview to stop

- the audio tape of the interview will be destroyed at the conclusion of the project. But any raw data on which the results of the project depend will be retained in secure storage for five years, after which they will be destroyed

- the results of the project are likely to be published and will be available in the University library and on the Centre for Sustainable Cities website, but my anonymity will be preserved.

I agree to take part in this project

_____   _____

(signature of participant)   (date)

Well-being outcomes of participating in ecological restoration and community gardening initiatives.

INFORMATION SHEET FOR TEACHERS

Thank you for showing an interest in this project. Please read this information sheet carefully before deciding whether the school group should pariticpate or not to participate. If you decide to participate we thank you. If you decide not to take part there will be no disadvantage to you of any kind and we thank you for considering our request.

What is the aim of the project?

This project is conducted as part of a fourth year medical student public health project. The aim is to document the experiences of individuals involved in ecological restoration and community gardening projects to determine if these activities have an effect on well-being and social capital outcomes.

What will participants be asked to do?

Should you agree to take part in this project, the school group will be asked to participate in an informal face–to–face interview to explore the themes as outlined below. The interview will be more like a conversation rather than a set list of questions.

What data or information will be collected and what use will be made of it?

The general theme we would like to explore involves the impact working in a community garden or ecological project has on your mental well-being. For instance, areas such as the participant's motivations for being involved and remaining involved in the project, changes within themselves that have come from being involved and their perceived impact of the project on the community and members of their group, may possibly be explored.

In the event that the line of questioning does develop in such a way that they feel hesitant or uncomfortable they are reminded of their right to decline to answer any particular question(s) and also that they may withdraw from the project at any stage without any disadvantage to them of any kind.

All interviews may be digitally recorded and later used for transcription. We may use part of the interview in the final report and presentation. There will be no mention of any names. The data collected from these interviews will be analysed for emergent themes and subthemes.

The data collected will be securely stored. At the end of the project the recordings and information will be destroyed.

The results of the project may be published and will be available in the University of Otago Library (Dunedin, New Zealand) but your anonymity will be preserved.

We invite you and the group to attend our research presentation on the 21st of October 2011, 10.30am at the Wellington School of Medicine, Mein Street, Newtown (level D).

What if participants have any questions?

If you have any questions about our project, either now or in the future, please feel free to contact:-

Dr Paul Blaschke (Supervisor) paul.blaschke@otago.ac.nz

Appendix X: Teachers consent form

Well-being outcomes of participating in ecological restoration and community gardening initiatives.

Teachers Consent Form

I have read the participant information sheet and understand the process for the interviews.

All my questions have been answered to my satisfaction. I understand that I am free to request further information at any stage.

I know that:

- the school group's participation in this project is entirely voluntary

- the school group is free to withdraw from the project at any time

- the exact interview questions will depend on the way the interview develops. If any participant in the school group is uncomfortable with any of the questions they can choose not to answer that question or ask for the interview to stop

- the audio tape of the interview will be destroyed at the conclusion of the project. But any raw data on which the results of the project depend will be retained in secure storage for five years, after which they will be destroyed

- the results of the project are likely to be published and will be available in the University library and on the Centre for Sustainable Cities website, but all participant's anonymity will be preserved.

I agree to ~~take~~ the school taking part in this project

_____   _____
(signature of participant)   (date)

1. Mental wellbeing

a. Engagement/interest

b. Meaning or purpose

c. Self esteem

d. Optimism

e. Stress

f. Sense of accomplishment

g. Escape from daily life

2. Social Capital

a. Social skills

b. Community cohesion/connectedness

c. Building social relationships

d. Group direction/empowerment

e. Expanding networks

f. Equality

g. Reciprocity.

3. Cultural connectedness

a. Returning to cultural roots

b. Enhancing cultural awareness

c. Spiritual benefits

d. Cultural Sustainability

e. Mauri of land and environment

4. Challenges

Appendix XIII: Summary of relevant previous studies

Study ref.	Setting	Population	Study method	Mental well-being & social capital benefits identified
Armstrong, 2000b	Upstate New York (1997-1998). 20 community gardening programmes (63 community gardens in 56 counties).	N=20 (Community garden program co-ordinators)	Phone interviews	Some common reasons for participating in community gardens include: mental health benefits, enjoyment of nature/open space, and perception that it is a healthy activity. The data is suggestive of some differences between urban and rural programs.
Austin, Johnston & Morgan, 2006	Senior centre in upstate New York (2006)	N=6 (Community gardeners)	Assessment charts/Questionnaires	After eight weeks of community gardening programme there were statistically significant improvements in: social activity and total emotional score.
Earle, 2011 (Master's Thesis)	Auckland and Wellington, New Zealand. Interviews were conducted with supervisors and stakeholders. They took place at 4 different gardens.	N=35 (17 community garden stakeholders & 18 garden co-ordinators)	Interviews (mostly individual, but some with two or three interviewees) and observation	Mental health benefits: therapeutic value, developing nurturing side, connection with nature, interacting with nature, stimulation, respect for self. Social health benefits: facilitating social interactions and breaking down barriers, learning together, and strengthening communities.
Firth, Maye and Pearson, 2011	Nottingham, UK (2010). Two community gardens.	N is not stated	Semi-structured interviews, observation and 'ethnographical' techniques	Community gardens generate social capital in four main ways: 1.Bringing people together with a common purpose 2.Create a meeting place for people to interact 3.Inclusive activities 4.Building links with institutions and authorities
Heliker, Chadwick & O'Connell, 2000	Senior citizens centre and botanical garden in Texas (1996-1997)	N=24 (elderly volunteers)	Intervention study. Questionnaires and semi-structured interviews	Psychological and spiritual benefits which transcend socioeconomic, educational and cultural boundaries.

Study ref.	Setting	Population	Study method	Mental well-being & social capital benefits identified
Kidd, Pachana & Alpass (2000)	New Zealand, mostly lower North Island (1999)	N=145 (female gardeners aged 40-82). Note that this study was not limited to community gardening or eco-restoration projects so many of the participants are likely to have been private gardeners.	Interview, mail-out survey and letters containing personal stories about the meaning of gardening	According to the women surveyed, the most common reasons for gardening were: satisfaction, relaxation and rejuvenation, inner peace, creating something of beauty and enjoyment in caring for plants. Themes regarding the meaning of gardening which appeared in letters from female gardeners included: a connection to the past, a spiritual relationship with nature and God, an expression of creativity and freedom, a source of joy and satisfaction, a time for relaxation and problem solving, a source of enhanced well-being, and a therapeutic tool for stress release.
Kingsley and Townsend, 2006; Kingsley, Townsend & Henderson-Wilson, 2009	Port Melbourne, Australia (2006). One community garden.	N = 10 (6 Community garden committee members, 4 regular members)	Semi-structured interviews	Increased social cohesion, increased social support and increased social connections. In a later article, the authors identified additional benefits: a sanctuary from pressures of the world, a setting for learning, social connectedness and place attachment, a supportive environment, a place of spirituality, opportunities and a sense of achievement
Teig et al., 2009	Denver, Colorado (2005). 29 community gardens.	N=67 (Garden leaders and community gardeners)	Interviews (individual and group)	The social processes involved in community gardening were identified as: Social connections, reciprocity (helping each other), mutual trust, collective decision-making, social norms, civic engagement and community building
van den Berg, Winsum-Westra, de Vries, van Dillen, 2010	The Netherlands. 12 allotments gardens from 8 cities.	N=129 (Allotment gardeners), N=68 (Controls)	Written surveys	All measures of health and wellbeing were improved in the participants aged 65+, however, no significant difference was seen in the younger participants.
Wakefield, Yeudall, Taron, Reynolds, Skinner, 2007	Toronto, Ontario (2004). 10 community gardening programmes (14 gardens).	N= 55 (focus groups), 13 (solo interviews). Not clear if groups were mutually exclusive	Gardens-participant observation, focus groups and interviews	Improved mental health, stress relief, increased social health and community cohesion.

Study ref.	Setting	Population	Study method	Mental well-being & social capital benefits identified
Glover, 2011	Midwestern United States (date unclear). One community garden.	N = 14 (8 of whom were core members of the Old Town Neighbourhood Association)	Face-to-face conversational interviews.	Social capital can be both beneficial and costly. While the community garden was a symbol of collective achievement, the process that led to its development was associated with unequal access to social capital.

Appendix XIV: Comparison between ecological restoration and community garden groups

Themes	Ecological Restoration (ER)	Community Gardens (CG)	Comparison
1. Mental well-being			
a.Engagement/interest	"Most of my life I have been involved in kind of restoration projects, kind of interested in natural environment.. It's kind of my interest in the world really. I like the idea of working in a project in the community that I live in.. personally I was drawn to that." "I am interested in a beautiful environment" "felt like he didn't have enough time for volunteer work, but just made it work and turns out he does have enough time"	"They get to grow their talent" "I like having a connection with food, knowing where it's from" "Motivates me to eat healthy food"	Both group shared the same views
b.Meaning or purpose	"I was in prison for 23 years and so I'd wasted half of my life. I wanted to do something good in my life and by doing this voluntary job I feel better about myself" "gives me value"		This theme was only brought up by ER
c. Self esteem	"It's a fun thing to go and do with a bunch of people and feel good at the end of it that you have done some good work."	"I know there's been confidence grown" "it improves the clients [of the soup kitchen] self esteem and self worth" "Gained more confidence in myself" "I was scared before coming" "Sense of pride"	This theme was predominantly found in the CG group.
d.Optimism		"It's a good feeling going home (after gardening) and feeling positive"	This theme was only brought up by CG group.

Themes	Ecological Restoration (ER)	Community Gardens (CG)	Comparison
		"You can get very pessimistic about some things in the community and all the rest of it, and I feel like this is a place to be very positive"	
e.Stress	"Being in a place like this is a reminder to slow down." "A chance to live more in the moment."	"Without it, I feel overwhelmed more easily with the busy-ness of work and the city" "It [community gardening] lets me out of the rat race" "I can get away from all my ****" "Gardening really gives me peace of mind" "I find it relaxing, just being outside in the sun"	This theme was predominantly found in the CG group.
f. Sense of accomplishment	"I kind of like the sense of doing something. Like physically doing something to make things better."	"There's a sense of achievement, like we grew these, this is ours" "Very proud of our first lettuce from the garden" "Likes watching things grow and wondering why some things work and some don't" "I like growing my own food and eating it"	This theme was predominantly found in the CG group.
g. Escape from daily life		"It's a chance to get away from all the sick people in Newtown" "I have a need for green space"	This theme was only brought up by CG group.
2. Social Capital			

Themes	Ecological Restoration (ER)	Community Gardens (CG)	Comparison
a. Social Skills	"We collect seeds for the stream, it's like a social event." "essentially it gives new skills, new experiences, new relationships"	An opportunity to gain conversational skills" "They get to grow their talent" "I wasn't much of a gardener before" "People are learning together" "I haven't been much of a gardener but picked up bits and pieces" "Gaining life skills"	This theme was predominantly found in the CG group.
b. Community cohesion/connectedness	"Where people live in the city, that becomes very hard and they don't have space to socialize or to connect with nature. I think we start to see all sorts other issues with mental health and our connections with the community diminishing." "Brings together a cross section of the community" "It helped me settle into the community and feel more at home in Wellington."	Community gardening follows the partnership model" "There's a sense of community" "you make heaps of connections" "It has created a sense of community" "There's a sense of belonging" "I've made lots of connections" "Opportunity to have input (about the garden) and have that valued" "Helped me settle into Wellington" "People sees what needs to get done and most will put their hand up" "core members have always been supportive of one another"	This theme was predominantly found in the CG group.
c. Building social	"Group growing bigger"	"It gives me the chance to mix with others	Both groups shared the same

Themes	Ecological Restoration (ER)	Community Gardens (CG)	Comparison
relationships	"There are really nice people" "Being with people who are keen to make a difference" "I got to know people a lot better as a team" "the best way to develop a relationship is to work alongside them" "they see you're a human being after all not a bureaucrat"	who I wouldn't normally mix with." "If I bumped into them, we'd get a cup of tea and I'd give them a hug" "I get to meet people I wouldn't normally in day-to-day life – outside of my profession" "Socialising instead of isolating" "meeting new people that you otherwise wouldn't have mixed with"	views .
d. Group direction/empowerment	"The philosophy of our group is to keep positive so we can work with people" "Provides an event going on at the marae – "gives a focus for community growth" bringing people together – "gives a focus", "[one of the elders] thanked the streamcare group for putting [the marae] back on the map"		This theme was only found in the ER group.
e. Expanding networks	"Advocating people at the street to join this project because he thought this project was good for them" "He is the minister of Anglican Church. He has been advocating people in the church to group to join this project as he thought this project could bring a lot of benefits to them. So far, there are five of them have joined this project. Most of them have mental illness."	"Together, we have the idea of kind of expanding what happens in the group by running a community arts projects. It pretty much an integrated project"	This theme was predominantly found in the ER group.
f. Equality	"The people provide a social environment and this affect people in a positive way. It does not have that exclusivity	"I get to mix with others and we're all	This theme was predominantly found in the

Themes	Ecological Restoration (ER)	Community Gardens (CG)	Comparison
	and it makes everyone feels welcome."	level" "there's no hierarchy here, we're all equal" "It's an opportunity to talk on a level ground" "This is neutral territory, not like at the soup kitchen" "I've been able to learn about the people as real people not just clients [of the soup kitchen]" "There's a mutual respect for each other [in the community garden]"	CG group.
g. Reciprocity	Working for the community - "I've always enjoyed this sort of work"	"The clients are able to give something back to the kitchen" "giving something back to the community"	This theme was predominantly found in the CG group.
3. Cultural reconnection			
a.Returning to cultural roots	"Son is Māori, and he wants him to know about his culture growing up- ""Ideally we would like to get back to gathering kai and rongoa from the stream and surroundings as our ancestors did, without worrying about the pollution"	"It's good to get back to the land, like when I was a kid near the Marae" "Getting back to basics" "Lost generation"	This theme was predominantly found in the CG group.
b. Enhancing cultural awareness	"Better at pronouncing vowels in Māori words"	"It's part of my culture, you know us Māori we have collective thought"	Both groups shared the same views
c. Spiritual benefits	"A way of making a connection to god by making a	"Planting to the moon"	Both groups shared the same

Themes	Ecological Restoration (ER)	Community Gardens (CG)	Comparison
	connection with the environment"		views.
e. Mauri of land and environment	"Restoration has contributed to the "mauri" or the stream "Reconnecting with earth"	"People need to be grounded as part of their recovery"	Both group shared the same views.
4. Challenges			
	"Working with the council to get approval" "Only a few people doing most of the work à can lead to burnout" "some conflict in group, "pissed " one guy off" "Less public support" "no much change in community since project begin because it does not impact on the community directly so no one have any access to it" "Difficulties with surrounding farmers, them using the project as leverage for negotiations with council"	" There are issues with interest and motivation because of medication (mental health)" "Getting more people involved"	This theme was predominantly found in the ER group.