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2. INTRODUCTION

As part of the community-

-year long

sufficiency in the Lyttelton Harbour Basin (LHB) (Project Lyttelton [PL], 2013) After the 6.3 magnitude earthquake on February 22, 2011, the Lyttelton township was cut off from its surroundings for multiple days as the main entry, the Lyttelton Tunnel, was closed and other access routes were equally inaccessible (Ozanne & Ozanne, 2013). This identified the need for greater resilience and self-sufficiency within the natural disaster-prone zone. The concept of resilience refers to the ability of a system to adapt to crises and disturbances but also the ability to foresee such crises and prepare through recovery planning, aimed at mitigating any negative effects (Pir, 2009). Resilience in food systems is multi-facetted, focussing on processes starting with sustainable food production and ending with waste management, in order to facilitate a more locally-based, independent food system within the community (Pir, 2009). It is inherently connected to the concept of sustainable development, which was defined as

present without compromising the ability of future generations to meet their own needs

Much of the scientific literature stresses the importance of familiarising young children with gardening programmes to enforce life-long awareness of current global issues around food, such as food resilience and sustainable development (e.g. Bowker & Tearle, 2007; Kahriman-Öztürk et al. 2012; Lohr & Pearson-Mims, 2005). This literature also suggests that children as young as three are aware of the importance of sustainable practices concerning food and that these practices are an essential part of early childhood education (ECE).

Therefore this report is aimed at investigating the feasibility of gardening programmes in centre-based ECE facilities (Ministry of Education [MOE], 2010) around the LHB. It also asks the question if gardening programmes can have long-lasting benef -lasting is

understanding of the capabilities of children in ECE as well as with getting acquainted with the LHB community. An intensive literature review of relevant studies around edible gardens and their benefits was conducted by each team member, in order to become familiar with appropriate research methods. Based on this, it was decided that qualitative data would be best suited to answer the research question sufficiently.

Four semi-structured targeted interviews were conducted. Semi-structured interviews were chosen as this allowed for some important questions to be answered with the flexibility of adding fitting questions during interviews. The interviews were held at each of the following schools: Lly24(et)et(e)A2(st8)P46(framon D)et(n)=2016(Het)e4(er)5(rbo)6(u(w) (Fig. 1). Each interview

was conducted by two members of the research team, lasted approximately 30 minutes, and consisted of a conversation based around a series of questions (Appendix A), with additional questions added throughout the interview. Two interviews were held with primary school principals, one with a primary school teacher, and one with a preschool teacher. Each interview was recorded and analysed in order to obtain comprehensive data.

Additionally, a focus group was held at the PL headquarters to get opinions and ideas of several participants around the topic of edible gardens in ECE. This informal interviewing process allowed for participants to speak their mind freely amongst like-minded people. The participants included: a parent and restaurant owner from the community, two teachers from Kids First kprdeegaicipanmpan education, limitations to gardening programmes in the LHB, and the relationship

The methods chosen had some drawbacks that need to be accounted for as they impacted the quantity of the data. The first notable limitation to the study was a short time-frame, which proved difficult as interviews and focus groups are very time intensive methods. These methods require the coordination of numerous participants and conflicting schedules. With only ten weeks to perform research, four interviews and one focus group consumed the entire research process. The methods also required travelling to the research area, which was difficult because the LHB is isolated outside of Christchurch. Although the data obtained was limited in quantity, it is nevertheless representative of the majority of opinions within the LHB.

5. RESULTS

The LHB community values food education and believe in the importance of being self-sustaining and resilient. Therefore, all of our participants were familiar with the idea of education in gardening and the importance of it. The majority of the participants has been or is currently involved in a gardening programme in the LHB.

Kindegarten all run gardening programmes to some extent. Lyttelton West Primary was the only school included with no gardening facilities on site.

Every participant stressed the vast benefits of gardening for children in ECE. The participants outlined three common benefits for children involved in gardening: educational, health, and societal. It was stressed that children are learning more in . In fact, they are able to express

imagination, curiosity and creativity. Teachers also noticed a difference in the eating habits of children. Children who had participated in gardening activities were eating more diverse foods. Finally, it was brought up that gardens are a place to work with others, including the wider community. Gardening can help instil a sense of community and teamwork at a young age. Even though gardening is seen as beneficial by all of the participants, certain limitations can prevent schools from participating in a gardening programme. All school participants expressed facing some limitations due to seasonality of gardening and the cost of such a programme. However, the participants also noted that these limitations could easily be solved. Edible gardens can be maintained during the winter, such as in the form of indoor containers. Funding issues can be addressed through fundraisers and community involvement. Another major limitation discussed was the need for a passionate person to either guide teachers or educate the children themselves. Our participants agreed that it is not possible for a garden programme to work without a dedicated teacher, parent, or community member leading the programme on a regular basis.

The data obtained from the research methods gave the impression that ECE is exposing students significantly more to gardening and food resilience than primary schools. The primary school principals interviewed noted that this can partly be explained by the curriculum. Gardening education is not a part of primary school curricula and therefore other academic subjects are given priority. ECE teachers stated they enjoy more freedom in what they teach, resulting in a greater emphasis being placed on edible gardens.



Fig. 2 Community members hard at work at the Lyttelton community gardens. (source: www.lyttelton.net.nz)

6. BENEFITS

This section seeks to expand on the results and will be supported by relevant literature. The benefits have been categorised into health benefits, educational benefits and societal benefits.

6.1. Health Benefits

Children are perceived to spend too much time in the classroom and not enough time in outdoor recreational areas. Furthermore, outdoor recreational areas commonly exclude natural areas such as the garden (Stoelzle Midden & Chambers, 2000). Participants of the focus group and interviews believed that getting children outdoors for activity would encourage spending time away from technology and becoming more aware of surroundings. It can be argued that the garden is a natural classroom where many topical things such as climate change, waste management and ecosystems can be taught (Stoelzle Midden & Chambers, 2000). This natural classroom will help to create children who love spending time outdoors, undoubtedly having a continued effect as they get older.

Our study also demonstrated a c

our respondents noted a transformation in terms of food preferences and attitudes towards new foods. Children began to try a diverse range of fruits and vegetables after having spent time in the gard

becoming a real threat to young children. Blair (2009) states that broadening a -personalising that food can be a

step towards reducing the threat of obesity. Installing healthy eating habits early will not only ensure that children are receiving a nutritious diet but can also help install such habits at home. Young children are given the opportunity to bring home positive interactions from the garden. In turn, parents adopt new eating habits which could aid in the promotion of long-lasting food resilience (Libman, 2007).

6.2. Educational Benefits

Hallett, 2008). Children are able to explore the boundaries more so in ECE than in primary school. This is beneficial, as installing such learning at a young age means that children can continue this experience, even in the structured learning environment of primary schools.

One final educational benefit is the opportunity for kids to learn a range of practical skills such as knowledge about soil nutrition, maintenance of the garden, and cooking (Stoelzle Midden & Chambers, 2000). These skills can be taught early and can hopefully be further developed in primary school. Practical skills open up a new thought process for the children and offer a more applied approach to learning about food resilience.

6.3. Societal Benefits

The LHB is a very community-oriented area. All of our interview and focus group participants mentioned that gardens can be a place for community involvement. Some of the schools and early childhood educators already receive some form of help from community members in the running of the gardens. Community involvement can be a great way of generating external funding and assistance to help maintain the garden for future use. In addition, the involvement of the local community means children are taken even further outside their comfort zones and must learn to interact with their elders (Nimmo & Hallett, 2008).

A rather different societal benefit to come from gardens is the interactions amongst children themselves. Kids are taught to share food amongst classmates. Some young find it



Fig. 3 Jacqueline Newbound

of the Lyttelton community garden. (source: www.lyttelton.net.nz) challenging to engage with their fellow peers in the classroom (Nimmo & Hallett, 2008). However, gardens are a place where kids can socialise in a neutral environment. Many of our participants agreed with this and said that children learn how to mix with other children. Libman (2007) determined that gardening offers positive social interactions and was regarded by parents as the aspect that would have the longest lasting effect on their children.

Although it is hard to quantitatively assess how resilient and long-lasting a garden programme

organisations, however, it is met with lack of support from government departments (Elliot & Davis, 2009).

Expertise of teachers is an extremely important aspect when teaching children about food resilience as the teachers and principals are the foremost variables in the

employed by PL

e gardening

programmes in educational facilities (PL, 2013). The results of the interviews and focus group indicate that her support is critical in maintaining programmes in the LHB. Problems can arise when teachers are not knowledgeable about gardening pr

parents are appreciative about children learning about sustainability and resilience. However, some parents prefer the teaching of quantifiable subjects to increase numeracy and literacy skills instead (Ball &Vincent, 2005). Some parents also view ECE as an expansion of the motherly care received at home, with the aim of (Duhn, 2012).

Seasonality is another limitation when it comes to facilitating a garden for children to learn and play in. Numerous teachers mentioned the difficulty of maintaining such a programme during the cooler months. The growth of plants is limited. However, participants also mentioned that this can easily be overcome by shifting the garden indoors, in the form of containers and pots.

Lastly, space can be a limitation. Not every school can commit to making space available for the teaching of the children. Therefore, schools may have to take

8. RECOMMENTATIONS

In recent years, many authors have expressed increasing concern about how disconnected children have become from nature (e.g. Sobel, 1996). Through our research we have established three recommendations to help sustain food resilience for on-going generations within the LHB.

8.1. Curriculum

childhood

education philosophy, curriculum and pedagogy.

Curricula within New Zealand schools haven significantly over the last few decades aside from the introduction of national standards (MOE, 2013). The national standards address consistency issues across all New Zealand primary schools in reading, writing and mathematics. The introduction of garden-based learning would be a change in the way the same curriculum is taught in the classroom by moving it outside into an interactive environment. Although currently the MOE places no emphasis on the importance of interactive learning in the garden, some studies have shown that students wg3[(0003#3rnin)-4(g)] TJETBT1bBT1 0 0111 0 0[(ou8.43 496.63 Tow)3(n)

attitudes and behaviours toward sustainability and food resilience (Libman, 2007).

We suggest the observations of mentally or behaviourally disadvantaged children in gardening programmes to ascertain if participants in such gardening programmes can surpass limitations by engaging in this alternative learning method.

Finally, we as a group, all believe that gardens in schools can positively affect the wellbeing not just of children, but the land, the community and potentially the nation as a whole.

10. ACKNOWLEDGEMENTS

Thank you to Jacqueline Newbound, Margaret Jeffries, and Project Lyttelton for their valued input and help in meeting with the Lyttelton community. The authors would also like to thank all the participants; teachers, parents and community members, for their valued time. Many thanks also to our supervisor Karen Banwell. Your advice and guidance during the research process was much appreciated!

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