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School Kitchen Gardens: Cultivating a Child's Nutritional Habits, Environmental Knowledge, and Sustainability Practices

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SIT Study Abroad

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School Kitchen Gardens

Cultivating a Child's Nutritional Habits,
Environmental Knowledge, and Sustainability
Practices

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Colby College

Environmental Studies: Policy Concentration

Australia, Northern Rivers Region

Submitted in partial fulfillment of the requirements for Australia: Sustainability and
Environmental Action, SIT Study Abroad, Spring 2014




ISP Ethics Review

(Note: Each AD must complete, sign, and submit this form for every student's ISP.)

The ISP paper by _____Jeffrey Meltzer_____ (student) does conform to the Human Subjects Review approval from the Local Review Board, the ethical standards of the local community, and the ethical and academic standards outlined in the SIT student and faculty handbooks.

Completed by: Peter Brennan

Academic Director: Peter Brennan

Signature: 

Program: Australia: Sustainability and Environmental Action

Date: 16/5/2014

Abstract

The school kitchen garden is an innovative curricular program based on school children planting a garden and then learning to cook with the foods they grow. The program teaches students many life skills, along with teaching them about nutrition, the environment, sustainability, and almost every school subject. Researchers have studied various aspects of school kitchen gardens, but few have focused on kitchen gardens' influence on students' nutritional habits, environmental knowledge, and sustainability practices in particular, like this study does. The popularity of the kitchen garden program in Australia is mostly due to the celebrity chef Stephanie Alexander, who started a foundation that does everything from fund to provide curricular support to primary schools wanting to start a kitchen garden. This report examines two kitchen gardens in schools in the Northern Rivers Region of New South Wales, Australia—Tuntable Creek Public School and Main Arm Upper Public School. I analyzed over thirty peer-reviewed journal articles; conducted sixty hours of participant observation in the schools; surveyed eleven parents and twelve students; and interviewed seven parents, eight staff members, two volunteers, a member of the Stephanie Alexander Kitchen Garden Foundation, and ten students.

The two questions that guided my research were “how do school kitchen garden programs impact a students' nutritional habits, environmental knowledge, and practices of sustainability,” and “how can a school kitchen garden be successful and economically sustainable?” I found overwhelming evidence suggesting that the program 1) shifted students' nutritional habits towards fresher, healthier foods and encouraged them to be more adventurous eaters; 2) that the program is an effective way to teach students about the environment; and 3) that the program successfully teaches students to act and live sustainably. Because the kitchen garden program is so effective, researchers need to examine the factors that make the programs successful and economically viable. I found that successful programs should have a dedicated kitchen garden coordinator and have extensive support from the community. To make the program economically sustainable, schools can use the labor and donations from people in the community, sell produce from the garden, hold fundraisers, and charge a small student fee for the program.

Keywords:

- School kitchen gardens
- Environmental education
- Sustainability
- Child nutrition

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NSW = New South Wales	
SAKG = Stephanie Alexander Kitchen Garden	

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1 Introduction

1.1 Study Question, Goals, and Rationale

It seems like new environmental crises are popping up everyday but the solutions appear nonexistent, unrealistic, or politically controversial. For this report, I elaborate on a different, promising, and low-risk means for solving environmental issues, and it starts with the very children who will inherit the environmental problems for which they are for the most part not responsible. Just imagine a modest educational program with seemingly endless rewards that include not only helping students learn, but also improving their teamwork skills, self-esteem, eating habits, and environmental awareness. Such programs have already made inroads throughout the world, perhaps no more notably than in Australia.

I studied two primary schools in the Northern Rivers Region of New South Wales (NSW), Australia with “kitchen garden programs”—an innovative curricular program based on school children planting a garden and then learning to cook with the foods they grow—to see how students learn about the concept of sustainability and the environment. More specifically, I explored how children put that knowledge into use in their lives with regards to their own eating habits and practices of sustainability. The question that guided my research was “how do school kitchen gardens contribute to primary school students’ nutritional habits, environmental knowledge, and practices of sustainability?” After my first week visiting the schools, I also added the study question “how can school kitchen garden programs be successful and economically sustainable?” I chose to study gardens in primary schools because I believe that what children learn in their early years of schooling will remain with them for the rest of their lives. As the great educational innovator Maria Montessori (1948) believed,

Knowledge can be best given where there is eagerness to learn, so [primary school] is the period when the seeds of everything can be sown, the child’s mind being like a fertile field...All items of culture are received enthusiastically, and later these seeds will expand and grow. (p. 3)

Since sustainability must be integrated into lifestyles, it is important to educate children and “plant the seeds” of sustainability while their brains and habits are still forming. In another sense, it is wise to focus our attention on children because they have the most time left on this planet and will someday hold power to bring about change.

Both the NSW Department of Education and Communities and the Stephanie Alexander Kitchen Garden (SAKG) Foundation (both explained in sections below) have put enormous amounts of time, effort, and resources into supporting school kitchen gardens, so I believe it is very important to study the effectiveness of their models and to find ways they can be tweaked and improved. While many researchers have studied school kitchen gardens, to my knowledge, none have looked at those in the Northern Rivers Region and few have focused primarily on sustainability. For this study I did just that by examining two schools in the Northern Rivers Region—Tunable Creek Public School and Main Arm Upper Public School. I explored their kitchen garden programs and collected feedback and suggestions from students, staff, and parents in order to learn about what makes their programs successful and to find ways to improve them. Both schools, the NSW Department of Education and Communities, the NSW Office of Environment and Heritage, the SAKG Foundation, and other researchers will receive copies of this report, which will hopefully help them improve school kitchen gardens throughout NSW and Australia. Furthermore, I plan on extending my study in the U.S. next year as my university honor's thesis. I will use this study as a guide to conduct research there and to help critique and improve school gardens in both the U.S. and Australia.

1.2 Sustainability – Introduction and Context for this Study

I believe that a sustainable society is made up of people whose way of living is capable of being maintained indefinitely – understanding the importance of a connection with nature, using the earth's resources wisely, acting in environmentally conscious ways, and passing on a strong environmental ethic to its youth (Cuming, 2014, pers. comm.). Teaching children the concept of sustainability is one of the most important things older generations can do because it ensures that an adequate standard of living can endure over time. This project relates to sustainability in that it focuses on a program dedicated to the sustainable production of food, teaching children how to garden, and the relationship between sustainability and food choices. Education plays a key role in sustainability because in order to protect the Earth for an extended period of time, each generation has to do its share to teach its decedents to be sustainable.

Additionally, gardening in general embodies many aspects of sustainability, requiring the efficient use of water, sunlight, soil, and compost, and general knowledge of the local climate and what growing conditions are necessary for each individual plant. Gardening can

also teach children how to read and adapt to the environment, can be an important tool in our battle against climate change, and can teach children to value food as a resource (Cuming, 2014, pers. comm.). Gardening also reduces the amount of transportation in our food system, which can result in a major reduction in fossil fuel use and climate-change-inducing greenhouse gas emissions. In fact, the food system is responsible for about 23% of the greenhouse gas emissions in Australia (Sustain Northern Rivers, 2013, p. 4). By turning towards gardening and local foods, Australia—one of the largest emitters of greenhouse gasses in the world—can drastically reduce its impact on the environment. Along with dealing with the root cause of climate change, gardening and local food systems can also support the biological diversity of our ecosystems—including the wildlife, water, and soil—and can improve the lives of farmers, improve the healthfulness of our foods, and strengthen democracy (Shiva, 2008, p. 97). Furthermore, school kitchen gardens can teach students how to work together and become future leaders—potentially in the field of sustainability.

1.3 Environmental and Sustainability Education

The plethora of environmental crises the world faces today is well known, hotly debated, and difficult to solve. While some people look towards legislation and individual actions to help solve these problems, others look towards education. Many believe that increasing peoples' knowledge about environmental issues will be enough to inspire them to take action. However, many adults are stuck in their old, environmentally detrimental habits and were raised in an era when these habits were the norm and were unknown to be harmful. Therefore, it is important to teach sustainability to children, which is exactly what many schools around the world are doing. If you educate children at an early age how to live sustainably, sustainable habits will likely stay with them for the rest of their lives; many studies show that “adults who had significant and positive exposure to nature as children...are likely to be environmentally sensitive, concerned, and active” (Blair, 2009, p. 18).

Recognizing the multiple benefits of environmental and sustainability education, the decade from 2005-2014 was declared the United Nations Decade of Education for Sustainable Development and called for sustainability education “based on ideals and principles that underlie sustainability, such as intergenerational equity, gender equity, social tolerance, poverty alleviation, environmental preservation and restoration, natural resource conservation, and just and peaceable societies” (UNESCO, 2005, p. 28). The Australian

Government Department of Environment, Water, Heritage and the Arts (2010) built off of that framework and declared that sustainability education

provides the opportunity for students to explore and evaluate contested and emerging issues, gather evidence, and create solutions for a sustainable future. Education for sustainability can enable students to become effective citizens and active change agents by helping them to deal with complexity and uncertainty. (p. 4)

In 2001 the NSW Department of Education and Training put in place the Environmental Education Policy for Schools, which tries to integrate environmental education into all parts of a school's curriculum so that "students will learn to care for the environment as part of their normal everyday lives" (NSW Department of Education and Training, 2001, p. 8). The Policy requires every school in the state to develop and implement a School Environmental Management Plan, and "provides the opportunity to raise student awareness of the issues of environmental and sustainable development in the context of acting locally, thinking globally" (p. 19). Successful plans are ones that reach across curricula, are sustainable, and allow for the creativity of teachers, principals, and students. However, these plans are not just about education; they are overall management plans for schools and include other aspects of sustainability like water and energy use (Cuming, 2014, pers. comm.).

1.4 School Kitchen Gardens and the Stephanie Alexander Kitchen Garden Program

One new and promising aspect of many NSW schools' environmental management plans is the school kitchen garden. The NSW Department of Education and Communities (2012) created a website to help teachers set up and expand their own kitchen garden programs. The site allows students to share their own experiences and to learn from kitchen gardens in other NSW schools. The kitchen garden program is not just popular in NSW, however – it is an international phenomenon that has been around since the early 1900s, and "throughout the past 200 years, [has] been championed by many teachers who believe [it] provides the best way to enhance classroom lessons" (Skelly & Bradley, 2007, p. 98). At its essence, in a school kitchen garden, students raise a garden with edible plants, and then together prepare and cook meals with those foods. The program hopes to raise awareness about the issues of food accessibility and industrial agriculture, promote healthy eating, and

improve children's teamwork skills and self-esteem.

Stephanie Alexander, who developed the SAKG Foundation, is most responsible for popularizing school kitchen gardens in Australia. Alexander is a celebrity chef, restaurant-owner, and food writer from Melbourne, Australia who aims to "provide children with a pleasurable hands-on introduction to food education through growing, harvesting, preparing and sharing fresh, seasonal, healthy and delicious food" (Gibbs, Straiger, Townsend, Macfarlane, Gold, Block, Johnson, Kulas, & Waters, 2013a, p. 33). Ainslie Vallance (2014, pers. comm.) of the SAKG Foundation explained to me that in April 2013, there were 267 schools in the program, but as of April 2014 there were over 500 schools and she does not see the growth in number of member schools stopping anytime soon. In fact, the Foundation has a goal of reaching 800 schools, or 10% of the primary schools in Australia, which would be a significant achievement. The program targets primary school students from eight to twelve years old and requires students to spend forty-five minutes a week in the garden and ninety minutes in the kitchen as part of the school curriculum. According to Gibbs et al. (2013a),

The primary outcome of the program is children's willingness to try new foods. Secondary outcomes include [enhancing] children's skills, knowledge and confidence in the growing, harvesting, preparing and cooking of food;...[improving] children's cooperative behavior; child awareness and understanding of issues of environmental sustainability;... as well as the establishment of a positive learning environment. (p. 33)

The program seeks to embrace the benefits of hands-on environmental education as a way to change students' eating behaviors. Another major reason Alexander started the program was to afford children the opportunity to share a meal around an inviting table; she is quoted on her website saying, "I believe absolutely in the importance and power of the shared table...it is the meeting place, where thoughts are shared, ideas challenged, news is exchanged and where the participants leave the table restored in many ways" (Stephanie Alexander Kitchen Garden Foundation, 2014). Given the many potential benefits of kitchen gardens, the most common reasons they are created are for education, to improve the health of students, to teach students environmental sustainability, and to teach science, environmental studies, and nutrition (Guitart, Pickering, & Byrne, 2013, p. 113).

1.5 Obesity, Diabetes, & Nutritional Issues

A combination of a lack of physical activity and poor nutrition is leading to a plethora of health and financial issues around the world. Many people overeat, eat fatty foods that are

high in cholesterol and fat, and do not consume enough fruits and vegetables. For these reasons, many developed countries are facing epidemics of heart disease, obesity, type 2 diabetes, and other issues like asthma and sleep apnea (Cotugna, Manning, & Didomenico, 2012; Morgan, Warren, Lubans, Saunders, Quick, & Collins, 2010). Australia is no exception: “many Australians now eat fewer fruits and vegetables than is recommended for good health and have less contact with the natural world than did previous generations” and, “60% of adults and 25% of children [are] either overweight or obese” (Guitart et al., 2013, p. 110). Sustain Northern Rivers (2013), a nonprofit environmental organization, found that only 14% of the entire population of the Northern Rivers Region meets the fruits and vegetable consumption suggested by the Australian Government (p. 4). Some researchers believe that these problems originate in schools, where many children eat few fruits and vegetables, eat foods of low nutritional quality, and engage in little physical activity (Cotugna et al., 2012, p. 12). Many children (and adults) eat very few fruits and vegetables and have little desire to start eating them. They often have little experience growing their own food and some even think that food “comes from” the grocery store. In a 2013 Queensland newspaper article, one reporter laments,

Not that long ago, when more Australians farmed, grew food in the backyard and cooked meals from scratch, children learned life skills from their elders ... These days there are kids (and adults) around who have never seen a lettuce growing in real soil and wouldn't know how to do anything in the kitchen... The consequence of this breakdown in knowledge is that our kids tend to be fatter, less resilient and less capable. (The Chronicle)

Additionally, these unhealthy food choices are causing health problems that are putting a major strain on countries' health care budgets in a time when many nations are severely in debt.

1.6 Potential of School Kitchen Gardens to Solve these Issues

Previous studies on kitchen gardens have shown that they can transform students' eating habits and give them good, long-lasting background knowledge about the way food is produced (Guitart et al., 2013; Zidenberg-Cherr & Morris, 2002). Eating patterns that track into adulthood usually develop when children are school age, specifically with the consumption of fruits and vegetables (Morgan et al., 2010; McAleese & Rankin, 2007). For these reasons, and because food consumed at school accounts for over 35% of calories consumed by primary school students (Cotugna et al., 2012, p. 12), “nutrition education in

school can act as a tool for increasing healthful dietary patterns and reducing the risk of chronic diseases later in life” (McAleese & Rankin, 2007, p. 662). School kitchen gardens expose children to a wide range of fruits and vegetables, which is likely to increase their willingness to try these foods and adopt a more nutritious diet. As Guitart et al. (2013) write, “increased consumption of fruits and vegetables is associated with a noticeable decrease in the risk of diseases such as cardiovascular diseases, cancer and type 2 diabetes” (p. 111). Perhaps just as importantly, children often bring these habits and lessons home to their families and influence their eating habits as well. So along with preventing these health problems in children before they develop, the kitchen garden program can ameliorate the health problems those in their families are facing as well. Perhaps by putting monetary resources into school kitchen gardens, governments can save a significant amount of money in future health care costs and the program can pay for itself.

1.7 Other Studies on School Kitchen Gardens

Several studies have evaluated school kitchen garden programs in the past few years, but many have only looked at a few schools and have been fairly specific in focus. They have examined kitchen gardens’ impact on students’ nutritional knowledge, children’s consumption of fruits and vegetables, the kitchen gardens’ ability to improve students’ performance in school, and the effect on children’s attitude towards school, their interpersonal relationships, self esteem, and environmental awareness (Gibbs et al., 2013a, p. 33). Graham, Beall, Lussier, McLaughlin, & Zidenberg-Cherr (2005) discovered that “environmentally-based educational programs can have a beneficial impact on performance on standardized achievement tests, as well as attention and enthusiasm for learning” (p. 147). The Royal Horticultural Society (2007) found that school gardens encouraged children to be more active learners; be more resilient, confident, and responsible; learn vital job skills; embrace a healthier, more active lifestyle; work and communicate with people of all ages; become more skilled and creative thinkers; form stronger community bonds; gain a greater awareness of sustainability; and to better engage with their parents (pg. 6-7). Passy, Morris, & Reed (2010) had many of the same findings, but specifically found that school kitchen gardens gave students a “greater scientific knowledge and understanding; enhanced literacy and numeracy;...increased awareness of the seasons and understanding of food production;...development of a sense of responsibility; [and] a positive attitude to healthy food choices” (p. ii). Block, Gibbs, Staiger, Gold, Johnson, Macfarlane, Long, & Townsend (2012) also echoed the findings of previous researchers and found that kitchen gardens “had

increased [students'] confidence at school...[and had given them] pride and self-esteem with which they referred to their new skills, knowledge, and accomplishments in the kitchen and garden" (p. 422). Furthermore, Cotugna et al. (2012) found that school gardens have value in nutrition education because they "demystify unfamiliar vegetables, so that students would be more apt to incorporate those vegetables into their food preferences" (p. 18).

This study aims to further explore these same topics, but more specifically to evaluate the gardens' ability to enhance students' concepts of sustainability and environmental knowledge in the Northern Rivers Region of NSW, Australia. As Gibbs, Straiger, Johnson, Block, Macfarlane, Gold, Kulas, Townsend, Long, & Ukoumunne (2013b) believe, "the seriousness of the current prevalence of overweight children and obesity and the success of the program in increasing children's willingness to try new foods merit further investigation" (p. 145). This desire for more research into school kitchen gardens are shared by many researchers looking into school gardens, the NSW Department of Education and Communities, the SAKG Foundation, and both of the schools I chose to study.

1.8 Northern Rivers Region

As shown in Figure 1, The Northern Rivers Region is at the northeast portion of NSW, extending from the Queensland border in the north, the Clarence Valley in the south, the Great Dividing Range in the west, and the Pacific Ocean to the east. It "is dissected by three major river systems - the Tweed, Richmond and Clarence and has a predominantly rural outlook" (MyRegion, 2014). According to the NSW Department of Planning (2006), it "is one of the State's most attractive places to live and holiday, [boasting] a stunning coastline, more than 20 national parks, vibrant town centers, character-filled villages and a hinterland area, which includes both significant farmland and valuable bushland" (p. 1). Although the region is blessed with a beautiful landscape, according to Sustain Northern Rivers (2013), the Northern Rivers region "has high social disadvantage and vulnerability to rising food costs" (p. 4). As of June 2012, the population of the region was 300,000 and the unemployment rate was 5.74% - above the NSW average of 5.13% and the national average of 5.28% (MyRegion, 2014). Additionally, the average income as of 2009 was \$35,822—more than \$10,000 below the NSW average of \$48,793 and national average of \$46,599 (MyRegion, 2014). Major sectors of the Northern Rivers economy include agriculture, forestry, fishing, tourism, services, manufacturing, and construction (NSW Government Department of Planning, 2006, p. 7). Despite the relative socioeconomic disadvantage, the people of the

Northern Rivers region are among the most environmentally aware in all of Australia. Many families have their own gardens, compost, recycle, collect rainwater, conserve energy, and are part of the opposition movement to coal seam gas—one of the hottest environmental battles in Australia at the moment. The strong environmental awareness in the community makes it an interesting place to study school kitchen gardens.



Figure 1: Map of the Northern Rivers Region (Regional Development Australia: Northern Rivers NSW, 2014) with an added amended inset map showing Tuntable Creek and Main Arm (Local Guide Signs, 2013)

1.9 Tuntable Creek Public School

Tuntable Creek Public School is a small school in the small rural community of Tuntable Creek, which is outside the larger town of The Channon and is part of the Lismore City Council. As of April 2014, the school was made up of only 11 students, ranging from kindergarten through year six, with students from six through twelve years old. There are only two full-time staff members at the school—Alison Bath, the teacher principal, and Kathleen McMahon, the School Administrative Manager—and a handful of part-time staff members. For the most part, all of the students are in one class, although the kindergarten

through second years and the third through sixth years are often broken up. Sustainability is very important at Tumble Creek; according to the school website:

...sustainability [works] across the key learning areas of the curriculum and the whole school community. We start with local sustainability and over time develop student understanding of how their work contributes globally. Students and staff manage, observe and monitor our school's resources, waste and physical surroundings, then take on activities to protect and improve our school and the local environment. (Tumble Creek Public School, 2014)

The school has several well-established fruit trees, and has had a small garden for quite a long time, but it was not until 2013 when they applied and gained membership to the SAKG program. Alison Bath (2014, pers. comm.)—along with other parents at the school—supported the program because she thought it would be good for her kids in that it was sustainable, they already had some cooking and gardening, and that it would give her the extra push to implement gardening and cooking further into the curriculum. Alison explained to me that upon Tumble Creek's acceptance to the SAKG program, she and one other teacher went to the training by the SAKG Foundation in Brisbane, where they received many resources to implement and run their kitchen garden program. At the end of 2013, under the recommendation of the SAKG Foundation, they greatly expanded the area of their garden and are still in the process of improving this new area. Alison primarily runs the kitchen garden program, but has help from another teacher when cooking, Kathleen's assistance with the gardening, and another teacher's help with the online portion of the SAKG program. Additionally, their general assistant has built up most of the infrastructure the garden requires. Aside from the several established fruit trees, the school has a chicken and a rooster, several beds of vegetables, and has plans to build a greenhouse. Since there is only one class at the school, every student participates in the SAKG program. Although there are few kitchen accessories, the students have access to the permanent staff and canteen kitchen.

1.10 Main Arm Upper Public School

Main Arm Upper Public School is another small school located in the small rural community of Main Arm, which is outside the larger town of Mullumbimby and is part of the Byron Shire Council. The school also runs from kindergarten through year six, but since there are about eighty students at the school, they are able to have four different classes and a few more full-time staff than Tumble Creek. Sustainability is a core theme throughout the

school grounds and curriculum – in May 2014, they even hosted a seminar about sustainable schools. Although the website mentions little about sustainability and the garden, the school did send a letter home to parents about the “Kids in the Kitchen Program,” which is part of the SAKG program, and states:

our goal is to provide a cooking experience for our students that will assist them to make healthy eating choices along with teaching them basic cooking skills. Growing food at school provides students with abundant hands on activities that connect science, literacy and maths with sustainability.

Although Main Arm has had a school garden program for the last five years, cooking only started last year, and they only gained membership to the SAKG program this year. Christian Tranberg (2014, pers. comm.), the fourth through sixth year teacher at the school, attended the same SAKG training program in Brisbane as Alison Bath. According to Christian, the main motivation for joining the program was to find a good use for the garden’s produce. He now wants to get the most education out of the kitchen garden as possible, and unlike some other staff at the school, is more interested in the children learning about sustainability than the school itself being sustainable.

Christian Tranberg and Cass Curran, a parent of two children at the school, primarily run the kitchen garden program. Although every class year cooks, only the fourth through sixth year class works in the garden and follows the full SAKG program. Additionally, there is a popular Garden Club, made up of students from all class years, which takes care of many of the daily gardening tasks during their lunch and recess periods (Curran, 2014, pers. comm.). As of now, they use a portable kitchen with only basic equipment, but have plans to build a permanent, well-equipped kitchen in the near future. The garden consists of 12 raised beds and several fruit trees, but when I visited in April 2014, they were in the process of building a greenhouse, and were planning on getting native beehives, a chicken pen, and a complex composting system.

2 Methodology

To explore my two key study questions, I conducted a combination of literature review, surveys, participant observation, objective observation, and interviews—explained in the following sections. Because I was working in only two small schools with few students, I wanted to use as many methods as possible to make up for my small sample sizes and to gain the most accurate representations. Christine Freeman of the Dorroughby Environmental Education Centre (2014, pers. comm.) suggested six schools in the Northern Rivers Region with kitchen garden programs, two of which being Tuntable Creek Public School and Main Arm Upper Public School. I reached out to all six schools, but Tuntable Creek and Main Arm—which do not necessarily have the most successful or interesting kitchen garden programs—were the only ones that expressed interest in me studying their schools.

2.1 Literature Review Process

Using several online academic databases, I found peer-reviewed journal articles focusing on environmental education, school gardens, and school kitchen gardens. I also explored several government websites that pertained to my project, the two school websites, and the SAKG Foundation's website. Under the suggestion from my project advisor, Pete Cuming, I also looked at publications by Maria Montessori and Vandana Shiva – two respected international educational figures, and a number of relevant Australian and International Government organizations. Although I reviewed and was inspired by approximately forty journal articles, government reports, websites, books, and videos, I only drew on about thirty of them for this report. When reading each of these articles, I looked for statistics and quotes that related to my study questions to either include in my report or help me gain a further understanding of school kitchen gardens.

2.2 Overall Survey Process

I carefully crafted a survey specifically for parents and a survey specifically for students to fill out before I arrived at both schools. Along with the surveys, all students received an introduction letter and consent form to review with their families (see Appendix 1). The students brought the sheets home, read over the introduction letter with their parents, then the parents completed their survey and consent form and helped their children complete theirs. In addition to allowing me to introduce myself and explain what I would be doing in the schools before I arrived, getting out these survey packets early gave me plenty of time to analyze the surveys, arrange phone interviews with parents, and gain consent for the children

I was studying. The surveys had a variety of questions—both qualitative and quantitative, and open-ended and closed ended—relating to my study questions. I structured them in a way to get the students' and parents' points of view on the effectiveness of the gardens, particularly relating to the children's nutritional habits, environmental knowledge, and sustainability practices. I collected these surveys during my first trip to each school, and although my survey went out to every student in both schools, I only got four back from Tutable Creek (4 out of 11 or a 36% response rate), and eight back from Main Arm (8 out of 80 or a 10% response rate). Since I only received eleven parent surveys and twelve student surveys, my results are likely to contain bias; the surveys I received are likely to come from parents and students who are most supportive of the kitchen garden program. However, the surveys I did receive contain a lot of valuable information, and, in combination with the interviews and observation, helped me gain as full of a picture of the kitchen garden programs in these two schools as possible.

2.3 Participant/Objective Observation Process

I spent a full week at both schools during April 2014 to see the kitchen garden programs in action, for an overall time of about 60 hours. I spent three days at Tutable Creek and two days at Main Arm the first week, and then two days at Tutable Creek and two days at Main Arm the week after school holiday. Since the kitchen garden program only operated for a few hours during the week, I spent a significant portion of time observing the students in the classroom to see if the kitchen garden came up in other parts of the school day (i.e., I wanted to see if the kitchen garden was mentioned during math, writing, and music lessons). At times, I left the classroom to explore the gardens on my own, or to interview other teachers, school staff, and students. Other very important parts of the day were lunch, snack, and recess time when I witnessed what the students were eating and discussing, and when a lot of the students worked on the gardens. Throughout the whole observation period, I explored how effective I thought the gardens were and how they affected the students' behaviors and attitudes. I also collected as much information as possible from the teachers and garden coordinators about the school, the town, the children, and the gardens. This involved both casual conversations and more formal interviews (see the consent form for teachers and staff in Appendix 2). All students participated in the kitchen garden program, but only those with the proper consent were included in this report due to Human Subjects Review standards.

2.4 Interview Process

I interviewed as many people from as many different positions regarding the kitchen garden program as possible including teachers, staff members, volunteers, parents, students, and a member from the SAKG Foundation. I gained the most information on the schools and their kitchen garden programs through my eight interviews with teachers and staff members and two interviews with volunteers (see Appendix 3 for the teacher and staff interview guide). I also received important information from parents, who I mainly interviewed over the phone during school holiday. I interviewed seven parents and spoke with each of them for an average of 13 minutes (see Appendix 4 for the parent interview guide). I mostly asked them follow up questions from the answers they gave on their surveys, but I also asked them some new question relating to my newer, second study question – “how can school kitchen gardens be successful and economically sustainable?” For example, some questions I asked parents were what they thought of a weekly farm stand to sell produce and what it would take for them to become regular volunteers. Because the seven parent interviews constitute a small sample, they are likely biased. However, as with the surveys, they were a key part of my data portfolio.

Additionally, I had a phone interview with Ainslie Vallance, the Program Research and Development Manager at the SAKG Foundation for about 45 minutes. Most of my questions were structured to explore both of my study questions and to learn about her experience with the SAKG Foundation and environmental education (see Appendix 5). When school returned from holiday, I also interviewed the students who had the proper consent. Although it would have been best to randomly choose students to survey, since I was dealing with such small schools, it was unrealistic for me to do that. I ended up interviewing each of the 10 students who had the proper consent. I mostly interviewed children when they were on a break from class, but also interviewed a few of the younger ones during class with the permission of the teacher. I made sure to only speak with each child for about 10 minutes in a comfortable place in the presence of an adult. For those interviews, I explored patterns in the survey data and had the children extrapolate on their answers given in the survey (see Appendix 6). I tried to keep the interviews as simple and as casual as possible to ensure the comfort of the children and to get their most honest responses.

2.5 Analysis

During the two-week school holiday and following my second week at the schools, much of my time was spent analyzing my literature review, surveys, observation, and interview data. When analyzing the survey data, I looked for trends and other things I found interesting, which I further explored on my second trips to both schools, through the parent phone interviews, and then through the individual interviews with students. I also calculated statistics for my quantitative survey data to include in my report.

2.6 Confidentiality

Following Human Subjects Review standards, all children have remained anonymous in this report. For those over the age of 18, only those who wanted to be cited in my report are, and each had the opportunity to review the report before final publication in case I inaccurately quoted them or they no longer wanted to be cited. Those people are cited parenthetically as they appear in my report and are also listed in my references section. I used the actual names of the schools and towns under the permission of both principals. They are proud of their kitchen garden programs, were happy to have their accomplishments publicized, and were eager to see my suggestions for improving their programs.

3 Results – the Effects of School Kitchen Gardens on Students

3.1 Effects on Children’s Nutritional Habits

Although many of the students in the two schools I studied had healthy eating habits before starting the kitchen garden program, the program still seemed to shift their eating habits towards healthier foods. A common theme that ran across my research was that students were trying and enjoying fruits and vegetables that they had thought they disliked before or disliked when their parents prepared it for them at home. Alison Bath (2014, pers. comm.), Kathleen McMahon (2014, pers. comm.), Christian Tranberg (2014, pers. comm.), and Cass Curran (2014, pers. comm.), the four staff members primarily in charge of the SAKG program at the two schools, each said this to me in one way or another. Through my student interviews, a common response to the question, “why do you think you try new foods in this program,” was that students did not have access to these foods at home or that their parents had never served it to them before. Many of the students also told me they tried new foods because they knew the foods were healthy and they wanted to grow “big and strong.” Additionally, out of the eleven parent surveys I received, on a scale of one to five for the question, “to what extent do you believe your child chooses healthier foods due to the school kitchen garden program,” the average score was a four, suggesting the program was having a significant positive impact on students’ eating habits. On the student survey, for the question, “are you more likely to choose and eat fresh fruits and veggies now than before the program,” one student answered “not at all,” three students answered “a little more likely,” and seven students answered “a lot more likely.” Moreover, every single person I interviewed told me that they believed the kitchen garden program shifted students’ eating habits towards healthier foods—at least to a minor extent.

I believe there are two major reasons why children try new foods during the kitchen garden program: because a) they grow it and cook it themselves, and b) they see their classmates trying the foods as well. Several students I interviewed told me they preferred fruits and vegetables they grew themselves because they knew that they took good care of the food and that it was not poisoned like the ones they thought at grocery stores were. Most students also told me they tried new foods from the kitchen garden because it was fresher and tastier than those they had tried before from grocery stores. I also think that when children see their friends trying new foods, they are more likely to try it themselves because they think it is safe and the cool thing to do. Fruits and vegetables often have a bad reputation among children, but if children see others trying it, eating fruits and vegetables can be “cool” and

acceptable. Additionally, the children may be more likely to try new foods because they are not forced to do so like they may be at home.

Another factor that likely plays into the positive nutritional outcomes of the program is the way nutrition is taught. As the SAKG Implementation Manual (2012) states, “we want to convince children to modify their eating habits because the food they are experiencing tastes good, rather than because they are being told to eat some food and not to eat others” (p. 8.1). Furthermore, Alexander & Dollard (2012) write, “tables and pyramids, ‘good’ foods and ‘bad’ foods, guidelines to canteen managers and discussions centered on ‘health’ and ‘nutrition’ have all failed to make changes in the food habits of our children” (p. 6). Teaching students to eat unhealthy foods in moderation seems to be a much more effective way to shift children’s eating habits than banning them altogether.

3.2 Effects on Students’ Environmental Knowledge

My research suggests that gardening is a much more effective way to teach students about the environment than classroom teaching alone. Through my phone interviews with parents, I learned that many of the students have shown a much greater interest in the environment since starting the program. Venessa Sky (2014, pers. comm.) told me that her daughter is proud to share her accomplishments with her when she gets home from school and has shown more interest in working in the garden at home. Another parent told me that her daughter is now much more aware of the weather, why she does things like conserve water, and the overall implications of her actions on the environment. Joanna Pitt (2014, pers. comm.) told me that her older daughter is now more aware of the seasons, which is something Ainslie Vallance (2014, pers. comm.) also believes is a key positive outcome of the program. On the parent survey, out of the eleven responses to the question, “on a scale of 1-5, to what extent do you believe your child’s environmental awareness has grown due to the kitchen garden program,” the average score was a four, suggesting that the kitchen garden program is effectively changing students’ environmental knowledge in both schools. Furthermore, to assess the environmental knowledge of the students I interviewed, I asked them, “what are some problems you think the Earth is facing,” and “explain to me what compost is, how it is made, how it is used, and why it is used.” I was surprised by the sophistication of the students’ responses. To the first question, some of the common responses were coal seam gas, deforestation, climate change, and pollution. To the second question, every student I interviewed knew that compost was primarily made from food

scraps and that it was good for plants, and many knew that worms and animal waste played a role in its make-up.

I believe that the program had a positive impact on students' environmental knowledge because it is engaging and offers a wealth of educational opportunities. Effective gardeners need to know the growing conditions necessary for each plant, how to use compost, how to keep the soil healthy, how to keep pests away, how to attract beneficial insects and animals, and many other things grounded in science, ecology, and the environment in general (Blair, 2009, p. 17). I believe that most students respond more effectively to hands-on education than verbal education and enjoy being outside and getting their hands dirty. Students often find it easy to learn about seasons when they have to plant certain species that require different amounts of sunlight and rain, and also find it easy to learn about the water cycle, soil types, nutrient recycling, and climate change while witnessing it first-hand.

Working outside in the garden in combination with classroom lessons can be an extremely effective way to teach about the environment and sustainability, and using the garden to complement lessons in the classroom can increase interest in both arenas. For example, when I visited Main Arm, in preparation for the arrival of native beehives to the school, the kindergarten and first grade classes were doing art projects on bees, were reading books about bees, and were learning why bees were beneficial to the environment. Additionally, in the term I was visiting Main Arm, Christian Tranberg (2014, pers. comm.) was teaching the fourth through sixth year class an entire unit specifically on sustainability, ecosystems, and healthy gardens. However, when I was there, I do not think they used the full potential of the garden as a resource to enhance the lesson. For instance, they could have chosen garden objects to classify and used garden plants to explore the characteristics of living things. Similarly, when I was at Tutable Creek I noticed a few missed chances to teach about the environment. For example, at one point the students were weeding and instead of explaining that weeds steal water and nutrients and block sunlight from the plants they want to grow, the teacher simply told the students to weed because, if they did not, the weeds would take over.

3.3 Effects on Participants' Sustainability Practices

Similar to many previous studies that found that kitchen gardens introduce children to local food systems, food waste, and other aspects of sustainability, I found that the students

had positive changes in their sustainability habits from the kitchen garden program (Blair, 2009; Passy et al., 2010). To assess the sustainability practices of the students I interviewed, I asked them, “if you had to buy fruits and vegetables, where would you go to buy them?” A majority of the students told me that they would shop at a farmers’ market because the food there is local (and does not have to be transported from around the world), and is fresher, tastier, healthier, and safer than food from a grocery store. Also, out of the 12 student surveys I received, while a few of the students did not know what the term “environmental sustainability” meant, other students believed it meant: “not to hurt the planet,” “working with the environment,” “looking after nature,” “keeping the land and nature a good and healthy place to maintain the environment and the Earth,” “an approach which considers the environment and applies strategies which do not exploit the Earth’s resources,” and “doing something good for the environment.”

A key aspect of sustainability is minimizing and repurposing “waste,” which is extremely relevant to the kitchen garden program. One way the two schools teach about waste through a divided waste disposal system. Every classroom and outdoor gathering area at Main Arm has a rubbish bin, a compost bin, and a recycling bin. At Tuntable Creek, there is a recycling bin and a rubbish bin in each building, and all compost is thrown directly into the chicken coop. At both schools, I observed how students disposed of their food scraps. At Tuntable Creek, students did indeed throw their food scraps into the chicken coop, but at Main Arm only about half of the students used the compost bin even though there was a compost bin next to every rubbish bin. Maybe if the school had a more functional compost system, students would be more motivated to compost all of their food scraps. Cass Curran (2014, pers. comm.) explained to me that the compost bins are not very functional at the moment because the students are in charge of it; since she is only at the school two times a week, she cannot supervise the appropriate maintenance of the system.

From my limited sample of student surveys and interviews, it seemed like the students at Main Arm might have achieved more significant understandings—and changes to their practices—of sustainability than at Tuntable Creek. A couple Tuntable Creek parents told me that their children just thought gardening was fun to do and did not really know the reasons why it was good for the environment. They would like to see more lessons about organic food and the dangers of chemicals and industrial agriculture, which are important aspects of sustainability that are associated with gardening. I believe the students at Main

Arm might have responded more strongly because, from what I observed, they received more explicit lessons about sustainability than at Tutable Creek. Although the teachers at Tutable Creek strongly believed in the value of sustainability and local food systems, they did not explicitly teach it to their students; Alison (2014, pers. comm.) told me that she only taught incidental lessons on sustainability and did not go out of her way to teach sustainability. At Main Arm, on the other hand, Cass Curran (2014, pers. comm.) is extremely passionate about local food systems and sustainability, making sure to explicitly teach it to her students. Additionally, when she cooks with the students, she tries to use as many ingredients from the garden or from the local farmers' market as possible. She often brings students to the farmers' market in Mullumbimby to meet local farmers, purchase fresh and sustainable foods from them, and experience the rest of the farmers' market. At Tutable Creek, although there are good intentions and still many educational values, many of the ingredients used for cooking were from the grocery store and not local. If the funding is available, teaching students the value of purchasing and using more local ingredients could go a long way.

Of course, all of these lessons in sustainability would mean very little if the students did not change their own habits or adopt them in their future lives. On my student survey, when I asked students if they would plant a garden, compost, recycle, buy organic foods, shop at farmers' markets, avoid fast food, and eat heaps of fruits and veggies when they grew up, most students responded that they would. This suggests that the kitchen garden program is having a significant impact on students' practices of sustainability and will continue to have an impact throughout the rest of their lives. Cass Curran (2014, pers. comm.) believes that the garden has opened a window for students that will be there for the rest of their lives. She believes the kitchen garden program will either encourage students to take on sustainability for a living or to employ sustainable habits in their lives. Ainslie Vallance (2014, pers. comm.) also believed a valuable aspect of the program was teaching students to be advocates for change in their personal lives and in their communities. The program teaches students to begin to understand that starting small can lead to big changes—in sustainability, social action, and life in general.

4 Factors that Lead to a Successful Kitchen Garden Program

Because kitchen garden programs are so effective at improving children's nutritional habits, environmental knowledge, and sustainability practices, it is important to examine the factors that lead to successful programs so that they can be emulated and improved. One previous study found that successful programs require "funding, staff support, administrative support, time, parent volunteers, and a garden coordinator" (Graham et al., 2005, p. 150). Similarly, I found that the two most important factors that lead to a successful program are a passionate and committed coordinator and support from the community. Stephanie Alexander originally envisioned having dedicated specialists run the program, but recently, in order to appeal to more schools and to make the program more affordable, the Foundation now allows teachers to run the program, which is why Alison Bath is able to run the kitchen garden program at Tuntable Creek. Although Alison is committed to the program, she has so many other tasks on her hands and cannot dedicate as much time and energy to the kitchen garden program as Cass Curran at Main Arm can. Cass is extremely passionate about gardening, cooking, sustainability, and teaching, and is able to dedicate her time at Main Arm solely to the kitchen garden. While I found that a part-time coordinator solely dedicated to the garden is better than relying on teachers to run the program, even Cass (2014, pers. comm.), who is part-time at the moment at Main Arm, thinks that if she had a full-time position she could make the program a lot more extensive and successful. The times that I visited the school, she seemed to never have enough time to do what she thought the program needed and probably could have worked 40 hours a week.

Several times during my observation at Main Arm I saw the Principal, Cass, Christian and others plan out the lessons and the schedule for the kitchen garden program. Christian (2014, pers. comm.) even explained to me that they are soon going to organize a task force to create a shared vision for the program. This task force will be composed of himself, Cass, the Principal, several students, and a few parents and will plan out what they want the future of the program to look like. At Tuntable Creek, on the other hand, since Alison Bath (2014, pers. comm.) is the only full-time teacher, she has to plan the kitchen garden lessons herself, which does not really allow her the opportunity to bounce ideas off of other teachers. Aside from arranging the lesson plans and schedule of the garden, it seems like a paid kitchen garden coordinator is necessary to get the various stakeholders together and ensure that students reap the most rewards out of the program. Perhaps if Tuntable Creek had a specialist solely dedicated to the kitchen garden program, the other teachers could get more

time to focus on other academic matters and the students could get more out of the already-rewarding program. Alison thought that a paid or volunteer coordinator, who could organize other volunteers and fundraisers, would be very helpful. A coordinator could also take care of the garden during breaks—handling the watering, harvesting, and weeding—to ensure the stability of the garden during these tricky time periods.

Another very important factor for a successful kitchen garden, in addition to a program coordinator, is community support. Christian Tranberg (2014, pers. comm.) feels it is important to have the community on-board because the program needs volunteers and it needs people with different kinds of skills to assist in the many aspects of the program. Henryks (2011) also found that “the community of parents and volunteers had disparate skill sets that the project drew on and that enabled them to get the project up and running” (p. 575). While Tuntable Creek tapped a bit of parents’ time and expertise, Main Arm used the members of the community extensively at all steps of the process. They had a parent who was the dedicated grant writer, parents who volunteered in the garden, parents who volunteered in the kitchen, farmers who donated produce, and others who helped improve the garden infrastructure (Curran, 2014, pers. comm.).

To receive community support, effective communication is crucial. For example, one parent I interviewed at Main Arm was a committed volunteer at the school, yet knew little about the kitchen garden program. She would love to help out with the kitchen garden, yet did not even know that assistance was needed. Christian (2014, pers. comm.) explained to me that the primary way he tries to communicate with parents about the kitchen garden program is through his own personal blog and a student blog. An online blog seems like an excellent way to publicize the garden, but even he thought that most parents did not read it—the school should consider publicizing these blogs more and possibly even include portions of it, or a regular kitchen garden bulletin, in the weekly school newsletter. Since Tuntable Creek began the program, they have written about and included photos of the garden in their newsletter in order to keep parents updated about the program.

5 Ways to Make a Kitchen Garden Program Economically Sustainable

A successful kitchen garden program, as described in the previous section, can require fairly extensive resources and funding. After the initial garden and kitchen infrastructure is put in place, which can be a costly exercise, the greatest expense is likely to be a kitchen garden coordinator. Since most school budgets are already strapped for cash, schools need to either apply for grants or raise money in other innovative ways. Both Tuntable Creek and Main Arm did not receive a SAKG grant, so they had to rely on other avenues, including grants from the NSW Government and NSW Environment Trust. Because the Foundation cannot offer grants to every school, according to Ainslie Vallance (2014, pers. comm.), the Foundation also offers assistance with funding difficulties. She told me there is one staff-member at the Foundation with a wealth of information and practical ideas who is there to help schools struggling with finances at any stage of their program and offers weekly phone chats. They also have a forum with ideas to make the program economically sustainable. However, both schools I studied did not know that these resources existed, so the Foundation should consider doing a better job publicizing it. From my own observations, surveys, and interviews, I think the best ways to raise money for the program, aside from applying for grants, are to recruit free labor and donations from the community, to sell products from the garden, to hold events to raise money, and to require students to pay to participate in the program.

As mentioned in the previous section, it is important for schools to reach out to the community for donations of time for volunteering, garden tools, extra produce, kitchen supplies, and other various materials and implements that kitchen gardens need. Donations from the community could drastically reduce the costs to the school of the program. Alison Bath (2014, pers. comm.) explained to me that parents donate a meal some Fridays for canteen and that the funds go towards the garden program. Parents are happy to cook for the school every once in a while because they see the value of supporting the school and being involved in their students' educational experience. Perhaps students could even make food for the canteen from the garden, which, as I discovered through my interviews, is an idea supported by students and parents. This way they could serve healthier foods and raise money for the kitchen garden program at the same time.

I think one of the best ways to raise money for the program is by selling the produce to parents and the community surrounding the school. Alison Bath (2014, pers. comm.)

explained to me that Tunnable Creek has a basket at The Channon General Store to sell some excess produce but it only raises enough money to buy a few packets of seed. Perhaps they could increase their sales at the General Store by selling potted plants, more specialty crops, or cosmetic products, as Christian (2014, pers. comm.) would like to do at Main Arm. During my visits to Main Arm, they started their first-ever farm stand, which I see as a promising way to raise money. By setting up a farm stand, not only do parents get to learn about the program (and the kids get to learn important communication, business, and teamwork skills), but also the students get to raise a hefty sum of money. The parents seemed genuinely happy to support the program, and the children were thrilled to raise \$113. I think that if the students sold their produce to parents every week, they could earn enough money to pay for a part-time kitchen garden coordinator. Another way to raise money would be to set up a stand in the nearby weekly farmers' market. One parent at Main Arm was in strong support of a stall at the farmers' market because "it would give [children] the understanding of a business set up" and would allow the students to reach a broader and more well established customer base (Sky, 2014). To get the students' perspective on selling produce to the community, I asked them, "how would you feel about selling your produce to make money for the program?" and every single student I asked thought it would be a good idea and would be an enjoyable fundraising experience. One girl thought it would be a good idea because she would be able to share fresh produce with the community, and one boy told me that selling food to the community would be fun and would make him feel proud because he grew it himself.

For Mothers' Day, Cass Curran (2014, pers. comm.) was planning an "afternoon tea" for all of the mothers in the school with snacks and drinks made primarily from produce in the garden, served and made by the children. Although she is not charging admission to this event, events like these could certainly be used as a fundraiser for the program, and could also create a lot of positive personal relations for the program and recruit volunteers. Another way that Main Arm raises money for the program is by requiring kindergarten through third grade students to bring in \$2 per term for their cooking class, and the fourth through sixth year students to bring in \$10 per term to support their gardening and cooking classes every second week. When they sent home the sheet telling parents about these fees, they also asked for parents to assist with the program to take some of the pressure off of Cass and the other teachers.

6 Conclusions

6.1 Summary of Overall Findings

Kitchen garden programs seem to be an extremely effective way to teach students about the environment, nutrition, and sustainability, along with many other important life skills. I found that one of the greatest benefits of the kitchen garden program is a shift in children's eating habits towards more healthful foods. Although many of the students I studied had good eating habits before starting the program, most of them became more adventurous eaters and more aware of proper nutrition while participating in the program. A second major benefit of kitchen gardens is an improvement in students' knowledge of the environment. Because the program is mostly outside of the standard classroom setting, students seemed to enjoy it more and did not notice they were learning an extraordinary amount through the process. A third key benefit of the program is an improvement in students' practices of sustainability. Growing and cooking foods at school teaches students the value of local foods, which embody several key aspects of sustainability.

For a kitchen garden program to be successful, there should be a paid staff member solely responsible for the program. Although a teacher can also run the program, a separate coordinator could dedicate all of his or her time and energy into it. This coordinator could plan lessons ahead of time, coordinate meetings between teachers, volunteers, and students, and could drastically improve the structure of the kitchen and the garden. Another key ingredient to successful kitchen garden programs is parent and community involvement so that people with disparate skill sets can improve the program and further educate students. For kitchen garden programs to be economically sustainable, I believe that schools need to: reach out to the community for labor and other donations, sell produce and other products from their garden, hold fundraisers for the garden, and require students to pay a small fee to participate in the program. If schools could secure a few grants for the program and employ one or two of these strategies, there is no reason the program should be an economic strain on schools.

6.2 Suggestions for Improving Kitchen Garden Programs

I discovered many key aspects of successful kitchen garden programs and ways that they could be improved and duplicated. Most importantly, schools should try to work some of the factors I discussed in sections four and five into their programs. I think it is extremely important to explicitly teach sustainability and the value of local food systems in the kitchen

garden program and to integrate the kitchen garden program with other class subjects and activities. Additionally, I think that schools should hire a coordinator that can focus all of his or her energy on the program. If schools are struggling financially with the program, they should reach out to the SAKG Foundation for help in making the program economically sustainable. Moreover, it is important to harness the knowledge and energy of parents and community members to make the program as successful as possible. To reach members of the community and parents, aside from writing about the kitchen garden in the newsletter, it would help to create signs and get other publicity for the garden. Signs could be educational, be an artistic outlet for students, and help garner community support. Additionally, if students wrote articles about their kitchen garden program in the region's newspaper, they could improve their writing and marketing skills, educate people in their community, and gain supporters and volunteers.

I found several other ways that kitchen gardens could be improved. In my survey for children, to the question "if you could change three things about the kitchen garden program, what would they be," five out of eleven students wanted more garden space to grow things. Aside from expanding the growing area, on both the parent and student survey, several people suggested smaller groups for cooking and gardening. With more intimate groups, children could participate more and receive more individual attention. Also, I think that both schools should set up and encourage the use of a more functional compost system as a teaching tool. Another issue I saw at both schools is that the foods in the canteen are mostly processed, frozen, and unhealthy; instead of serving unhealthy foods in the canteen, I (and many students and parents) think it would be a good idea to serve some food from the garden in the canteen. Lastly, Cass Curran (2014, pers. comm.) finds it extremely inspiring to see how other schools' kitchen garden programs operate. She thinks it would be helpful to improve the networking and collaborating between SAKG schools. Additionally, both Alison Bath (2014, pers. comm.) and Christian Tranberg (2014, pers. comm.) were not satisfied with the functionality and educational value of the SAKG "Shared Table" website, the Foundation's form of social media that each school needs to use, so the SAKG Foundation could try to make the site more user friendly, educational, and easier to share between schools.

6.3 Ideas for Future Studies

Because of the seemingly endless benefits of school kitchen gardens and because this was such a small study, much more research is needed. I suggest that future researchers: study schools in areas that are not as environmentally aware as the Northern Rivers Region; compare rural, suburban, and urban school kitchen gardens; study the motivations and outcomes of the program on volunteers; compare kitchen gardens under and not under the SAKG program; compare schools that have and have not received grants from the SAKG Foundation; complete the same study with more schools and over a longer period of time; follow students from before they start the program until a few years after participating in the program; study kitchen garden programs in high schools; compare the SAKG program to other kitchen garden programs; and compare school kitchen gardens in Australia to school kitchen gardens in other countries, which I plan on doing when I return to the U.S.

I have learned many lessons from this research process that will help me when I continue my study in the U.S. For one thing, I will try to get my survey out to multiple schools, and not just to the ones I study in-person. I will also reformulate the survey to include more quantitative questions so I can have more statistics in my report. For the schools I send surveys to, I need to do a much better job of encouraging students and parents to complete them. I will also try to observe the kitchen garden programs in more than two schools, and use my time more effectively so that I observe less of the classroom time and more of the gardening program. As the famous chef and food activist Jamie Oliver wishes, we need to aim “for everyone to help create a strong, sustainable movement to educate every child about food, inspire families to cook again and empower people everywhere to fight obesity” (Oliver, 2010). I wholeheartedly agree with Oliver and think that the kitchen garden program can be the missing ingredient that the environmental movement so desperately needs. The most important task of future research needs to be figuring out how kitchen garden programs can be implemented on a widespread international level in order to fight the health and environmental challenges, among other issues, that are likely to worsen in the coming years.

References

- Alexander, S., & Dollard, A. (2012). *Stephanie Alexander Kitchen Garden Cooking with Kids*. Melbourne, Australia: Penguin Group.
- Australian Government Department of the Environment, Water, Heritage and the Arts. (2010). *Sustainability Curriculum Framework: A guide for curriculum developers and policy makers*.
- Bath, A. (2014). Principal Teacher at the Tuntable Creek Public School. Personal Communication via face-to-face interview, 8th April 2014.
- Blair, D. (2009). The Child in the Garden: An Evaluative Review of the Benefits of School Gardening. *Winter*, 40(2), 15-38.
- Block, K., Gibbs, L., Staiger, P., Gold, L., Johnson, B., Macfarlane, S., Long C., & Townsend, M. (2011). Growing Community: The Impact of the Stephanie Alexander Kitchen Garden Program on the Social and Learning Environment in Primary Schools. *Health Education & Behavior*, 39(4), 419-432.
- Cotugna, N., Manning, C., & Didomenico, J. (2012). Impact of the Use of Produce Grown in an Elementary School Garden on Consumption of Vegetables at School Lunch. *Journal of Hunger & Environmental Nutrition*, 7(11-19).
- Cuming, P. (2014). Managing Director, Sustainable Futures Australia. Personal Communication via skype and email, 20th February 2014.
- Curran, C. (2014). Kitchen Garden Coordinator at Main Arm Upper Public School. Personal Communication via face-to-face interview, 10th April 2014.
- Freeman, C. (2014). Director of the Dorroughby Environmental Education Centre. Personal Communication via phone interview, 27th February 2014.
- Gibbs, L., Straiger, S., Townsend, M., Macfarlane, S., Gold, L., Block, K., Johnson, B., Kulas, J., & Waters, E. (2013a). Methodology for the evaluation of the Stephanie Alexander Kitchen Garden program. *Health Promotion Journal of Australia*, 24, 32-43.
- Gibbs, L., Straiger, P., Johnson, B., Block, K., Macfarlane, S., Gold, L., Kulas, J., Townsend, M., Long, C., & Ukoumunne, O. (2013b). Expanding Children's Food Experiences: The Impact of a School-Based Kitchen Garden Program. *Journal of Nutrition Education and Behavior*, 45(2), 137-146.
- Graham, H., Beall, D., Lussier, M., McLaughlin, P., Zidenberg-Cherr, S. (2005). Use of School Gardens in Academic Instruction. *Journal of Nutrition Education and Behavior*, 37(3), 147-151.
- Guitart, D., Pickering, C., & Byrne, C. (2014). Color me healthy: Food diversity in school community gardens in two rapidly urbanising Australian cities. *Health & Place*, 26, 110-117.

- Henryks, J. (2011). Changing the menu: rediscovering ingredients for a successful volunteer experience in school kitchen gardens. *Local Environment*, 16(6), 569-583.
- Main Arm Upper Public School. (2014). Retrieved 6April2014, from mainarmpublicschool.com.au
- McAleese, J. & Rankin, L. (2007). Garden-Based Nutrition Education Affects Fruit and Vegetable Consumption in Sixth-Grade Adolescents. *Journal of the American Dietetic Association*, 107(4), 662-665.
- McMahon, K. (2014). School Administrative Manager at the Tuntable Creek Public School. Personal Communication via face-to-face interview, 7th April 2014.
- Montessori, M. (1948). *To Educate the Human Potential*. India: Kalakshetra Publications.
- Morgan, P., Warren, J., Lubans, D., Saunders, K., Quick, G., & Collins, C. (2010). The impact of nutrition education with and without a school garden on knowledge, vegetable intake and preferences and quality of school life among primary-school students. *Public Health Nutrition*, 13(11), 1931-1940.
- MyRegion. (2014). *Northern Rivers*. Retrieved March 28, 2014, from <http://myregion.gov.au/profile/northern-rivers#about>
- Local Guide Signs. (2013). Lismore Region Map. Retrieved 15April2014, from <http://www.localguidesigns.com.au/lismore-tourism/lismore-maps.php>
- NSW Department of Education and Communities. (2012). Kitchen Gardens. Retrieved 17th April 2014 from <http://www.kitchengardens.det.nsw.edu.au/index.htm>
- NSW Department of Education and Training. (2001). *Implementing the Environmental Education Policy in Your School*.
- NSW Department of Planning. (2006). Far North Coast Regional Strategy.
- Oliver, J. (Speaker). (2010). Teach Every Child About Food. [Ted Talks]. Retrieved 14April2014 from https://www.youtube.com/watch?v=go_QOzc79Uc#t=17
- Passy, R., Morris, M., & Reed, F. (2010). Impact of School Gardening on Learning. *National Foundation for Educational Research*.
- Pitt, J. (2014). Parent at the Tuntable Creek Public School. Personal Communication via phone interview, 14th April 2014.
- Public Schools NSW. (2013). Kitchen Garden Pilot program Evaluation Report.
- Regional Development Australia: Northern Rivers NSW (2014). Our Region. Retrieved 5April2014, from <http://rdanorthernrivers.org.au/our-region/>
- Royal Horticultural Society. (2007). Gardening in Schools: A Vital Tool for Children's Learning.

- Shiva, V. (2008). *Soil Not Oil: Environmental Justice in a Time of Climate Crisis*. Brooklyn, New York: South End Press.
- Skelly, S. & Bradley, J. (2007). The Growing Phenomenon of School Gardens: Measuring Their Variation and Their Affect on Students' Sense of Responsibility and Attitudes Toward Science & the Environment. *Applied Environmental Education & Communication*, 6, 97-104.
- Sky, V. (2014). Parent at the Main Arm Upper Public School. Personal Communication via phone interview, 14th April 2014.
- Stephanie Alexander Kitchen Garden Foundation. (2014). *About Us*. Retrieved March 31, 2014, from <http://www.kitchengardenfoundation.org.au/about-us>
- Stephanie Alexander Kitchen Garden Foundation. (2013). *Kitchen Garden Program Syllabus: Subtropical & Tropical Advances*.
- Stephanie Alexander Kitchen Garden Foundation. (2012). *The Stephanie Alexander Kitchen Garden Program: Implementation Manual, Third Edition*.
- Sustain Northern Rivers. (2013). Sustain Food Roadmap. *Sustain Food Working Group, Lismore*.
- The Chronicle. (2013). Kitchen Gardens Create Real Change. *Queensland, Australia*.
- Tranberg, C. (2014). Teacher at Main Arm Upper Public School. Personal Communication via face-to-face interview, 11th April 2014.
- Tunable Creek Public School. (2014). Retrieved 6 April 2014, from tunableck-p.schools.nsw.edu.au
- UNESCO. (2005). *United Nations Decade of Education for Sustainable Development (2005-2014): International Implementation Scheme*.
- Upners, J. (2014). Parent at the Main Arm Upper Public School. Personal Communication via phone interview, 14th April 2014.
- Vallance, A. (2014). Program Research and Development Manager at the Stephanie Alexander Kitchen Garden Foundation. Personal Communication via phone interview, 16th April 2014.
- Zidenberg-Cherr, S., & Morris, J. (2002). Garden-Enhanced Nutrition Curriculum Improved Fourth-Grade School Children's Knowledge of Nutrition and Preferences for Some Vegetables. *Journal of the American Dietetic Association*, 102(1), 91-93.

Appendix 1: Introduction letter, surveys, and consent forms for guardians and students

Explanation of Study (Please Keep This Sheet for Future Reference)

“School Kitchen Gardens: Cultivating a Child’s Nutritional Habits, Environmental Knowledge, and Sustainability Practices”

By Jeff Meltzer, *SIT Study Abroad & Colby College*

April 2014

Introduction and Background/Purpose: I am an undergraduate student with SIT Study Abroad and from Colby College in Maine, USA. I am undertaking this study as a part of my study abroad class. I will study the kitchen gardens in both Tuntable Creek Public School and Main Arm Public School and see how the program affects students, specifically with regards to sustainability. My study question is “how do school kitchen gardens contribute to primary school students’ nutritional habits, environmental knowledge, and practices of sustainability?”

I would greatly appreciate it if you could take the time to fill out the attached survey, consent form, and allow me to interview you at a later date. I look forward to the opportunity to speaking with you and your children. Before you agree to participate in this study, you should know enough about it to make an informed decision. If you have any questions, please ask me. I can be reached most easily via email (jmeltzer@colby.edu), but can also be reached via my mobile phone (0474 703 587).

Information: Participation in this study will involve some, if not all, of the following:

- The subsequent survey for students and their guardians (about 10 minutes each)
- Observation of the kitchen garden program during school hours (one full week at each school split up between the weeks of April 7th and April 28th)
- Phone interviews for guardians (about 10 minutes, from April 14th-April 24th)
- Individual interviews of individual students who have given both their own consent and have the consent of their guardian (about 10 minutes, the week of April 28th)

The information gained from all surveys, observations, and interviews will be incorporated into a written report and will be submitted for an undergraduate class and be included in the program library and may possibly be published on the internet. It will also form part of a short oral presentation that I will make to my class. I also intend to use the data back home for my senior honors thesis at Colby College in Maine, USA. Additionally, the study will be shared with the schools I am studying and the NSW Department of Education, through their sustainable schools program.

Risks: There are minimal risks involved in this study (see “Confidentiality” below). If any adult person believes that their responses are embarrassing or may bring retribution, they can choose to be kept anonymous.

Benefits: The direct benefit for participants is a chance to reflect upon their experiences with the kitchen gardens. Additionally, the final report will be circulated among the study schools, which will give the schools a chance to improve their programs based on the suggestions and comments of the participants’ surveys and interviews, and it will go to the NSW Department of Education to help other schools in the state to assist in improving their programs.

Confidentiality: You have the option of either remaining anonymous or of having your contribution to this study acknowledged. If you choose to be named, you will be able to view and approve of any quote before the study is published. If you choose to remain anonymous, the information in the study records will be kept strictly confidential and will be available only to myself, and no reference will be made in oral or written reports, which could link you to the study.

Participation: Your participation in this study is voluntary; you may decline to participate. If you decide to participate, you may withdraw from the study at any time. You may also decline to answer any specific question. If you withdraw from the study at any time the information already obtained from you will be destroyed.

Guardians' Survey (Students' Survey On Opposite Side) Please Return to School by April 7th

1. Do you consider yourself to be environmentally aware? No / Somewhat / Yes
2. Circle all of the things your family does at home:
Garden Recycle Compost Collect Rainwater Conserve Energy Buy Locally
3. On a scale of 1-5, to what extent do you believe the school kitchen garden is useful, necessary, and effective?
(Not at All) 1 2 3 4 5 (Very Much So)
4. On a scale of 1-5, to what extent do you believe your child chooses healthier foods due to the school kitchen garden program?
(Not at All) 1 2 3 4 5 (Very Much So)
5. On a scale of 1-5, to what extent do you believe your child's environmental awareness has grown due to the kitchen garden program?
(Not at All) 1 2 3 4 5 (Very Much So)
6. Circle the following things that you believe your child has improved upon directly because of the kitchen garden:
Teamwork Interest in School Leadership Skills Willingness to Try New Foods
Excitement in Going to School Ability to Describe Weather Patterns
7. In what ways do you think your child has benefitted the most due to the school kitchen garden?

8. In what ways do you think the school kitchen garden program could be improved or expanded?

9. Do you see the kitchen garden program as an effective way to teach students outside of the classroom, or as impacting adversely on classroom time? Briefly explain why.

10. Have you personally been involved in the kitchen garden program? If yes, how? If not, why not?

Consent (see explanation on study sheet): I, _____ allow my student _____, to participate in the school kitchen garden survey and interview process. All students' names will be kept anonymous in the final report, and human subjects review standards will be followed. Signed: _____ Date: _____ Researcher's Signature (leave blank): _____
Date: _____

- If quoted in the final report, I would like my name to be cited / to be kept anonymous
- For approval of quotes, please send a copy of the report to my email: _____

Phone Interview: If you would also like to be interviewed for this school kitchen garden research project over the phone, please give your phone number: _____, and list the best dates/time of day between Monday, April 14th and Friday, April 24th to reach you:

Students' Survey (Guardians' Survey On Opposite Side) Please Return to School by April 7th

1. If somebody asked you what environmental sustainability was, what would you say?

2. How much do you like your school kitchen garden program (circle one)?

I Would Rather Do Something Else

I Love It

I Don't Love It Or Hate It

It Is My Favorite Activity In School

3. What is your favorite part of the school kitchen garden program?

4. Are you more likely to choose and eat fresh fruits and veggies now than before the program?

No, Not At All

A Little More Likely

A Lot More Likely

5. Circle whatever you are now better at since starting the kitchen garden program:

Growing Food in a Garden

Preparing Food

Identifying New Fruits and Veggies

Identifying Weather Patterns

Working With Other Students

Interest in School

6. If you could change three things about the kitchen garden program what would they be?

- a. _____
b. _____
c. _____

7. Circle each of the following terms you have learned in the kitchen garden program:

Water Conservation

Climate Change

Local Food

Organic

Pesticides

Fertilizer

Processed Foods

Food Deserts

Permaculture

Whole Foods

8. If you had to make a home-cooked dinner, what would you make (be specific if you can)?

9. When you grow up, which of these things do you think you will do (circle all)?

Plant a Garden

Compost

Recycle

Buy Organic Food

Shop at

a Farmers' Market

Avoid Fast Food

Eat Heaps of Fruits and Veggies

• I want to be interviewed about the school kitchen garden program (circle one): Yes / No

• I am a 4 5 6 7 8 9 10 11 12 year-old kindy / 1st / 2nd / 3rd / 4th / 5th / 6th year
boy / girl in Mr. / Mrs. _____ class at _____ School,
and have been involved with the school's kitchen garden for _____ years

• Your signature tells me that your guardian has explained to you the purpose of my study and has told you of any benefits and risks: _____

Date: _____ Researcher's Signature (leave blank): _____

Appendix 2: Explanation of Study (for teachers and staff)

“School Kitchen Gardens: Cultivating a Child’s Nutritional Habits, Environmental Knowledge, and Sustainability Practices”

By Jeff Meltzer, *SIT Study Abroad & Colby College*

Introduction and Background/Purpose: I am an undergraduate student with SIT Study Abroad and from Colby College in Maine, USA. I am undertaking this study as a part of my study abroad class. I will study the kitchen gardens in both Tuntable Creek Public School and Main Arm Public School and see how the program affects students, specifically with regards to sustainability. My study question is “how do school gardens contribute to primary school students’ connections with nature, environmental ethics, and nutritional habits?”

Before you agree to participate in this study, you should know enough about it to make an informed decision. If you have any questions, please ask me. I can be reached most easily via email (jmeltzer@colby.edu), but can also be reached via my mobile phone (0474 703 587).

Information: Participation in this study will involve some, if not all, of the following:

- Observation of the kitchen garden program during school hours (one full week at each school split up between the weeks of April 7th and April 28th)
- Structured and unstructured interviews and conversations

The information gained from all surveys, observations, and interviews will be incorporated into a written report and will be submitted for an undergraduate class and be included in the program library and may possibly be published on the internet. It will also form part of a short oral presentation that I will make to my class. I also intend to use the data back home for my senior honors thesis at Colby College in Maine, USA. Additionally, the study will be shared with the schools I am studying and the NSW Department of Education, through their sustainable schools program.

Risks: There are minimal risks involved in this study (see “Confidentiality” below). If any adult person believes that their responses are embarrassing or may bring retribution, they can choose to be kept anonymous.

Benefits: The direct benefit for participants is a chance to reflect upon their experiences with the kitchen gardens. Additionally, the final report will be circulated among the study schools, which will give the schools a chance to improve their programs based on the suggestions and comments of the participants’ surveys and interviews, and it will go to the NSW Department of Education to help other schools in the state to assist in improving their programs.

Confidentiality: You have the option of either remaining anonymous or of having your contribution to this study acknowledged. If you choose to be named, you will be able to view and approve of any quote before the study is published. If you choose to remain anonymous, the information in the study records will be kept strictly confidential and will be available only to myself, and no reference will be made in oral or written reports, which could link you to the study.

Participation: Your participation in this study is voluntary; you may decline to participate. If you decide to participate, you may withdraw from the study at any time. You may also decline to answer any specific question. If you withdraw from the study at any time the information already obtained from you will be destroyed.

Consent: I, _____, agree to participate in the school kitchen garden survey and interview process. Human subjects review standards will be followed. Signed: _____ Date: _____

Researcher’s Signature (leave blank): _____ Date: _____

- If quoted in the final report, I would like my name to be cited / to be kept anonymous
- For approval of quotes, please send a copy of the report to my email: _____

Appendix 3: General Interview Guide for Teachers and Staff Members

1. Please give me a brief description of the history of the kitchen garden program at your school
2. Why are you involved with it?
3. What does sustainability mean to you and how does the garden fit into that?
4. What are the major strengths of the program?
5. What do you think are the major weaknesses of the program?
6. What influence do you think the program has on students' eating habits?
7. Do you think your students have a better grasp on the environment, its natural processes, and environmental challenges due to the program?
8. Do you think your students act/will act more sustainably in the future because of this program?
9. How do you envision the program looking like in a couple of years/if funding were not an issue?

Appendix 4: General Interview Guide for Parent Phone Interviews

1. If a farm stand were set up at the school every Friday morning, would you shop there?
2. What is stopping you from volunteering/would you volunteer if the school asked you?
3. How specifically has your child's food habits changed?
4. How specifically has your child's environmental awareness changed?
5. Is your child more willing to cook and garden at home now?
6. Do you think it is necessary to get support and assistance from parents and others in the community?
7. Do you think sustainability should be taught explicitly?

Appendix 5: Interview Guide for Ainslie Vallance Phone Interview

1. What inspired you to join the SAKGF?
2. Both of the schools I am studying did not receive a grant from your foundation and seem to be struggling to keep the program going monetarily. How do you suggest they make the program economically sustainable while still meeting your requirements?
3. How important do you think it is to have a person solely dedicated to the program (as opposed to teachers adding it to their other tasks)?
4. How have you seen children's nutritional habits change because of the program?
5. How have you seen children's environmental knowledge change due to the program?
6. How have you seen children's practices of sustainability change?
7. Have you seen a noticeable effect on participating student's families as well?
8. Can you see this model spreading to the United States?

Appendix 6: General Interview Guide for Student Interviews

1. Explain to me your favorite part of the kitchen garden program.
2. If you had to buy fruits and vegetables, where would you go to buy them?
3. How would you feel about selling your produce to make money for the program?
4. How would you like to make healthy meals for the canteen from your garden produce?
5. Why do you think you try new foods in this program?
6. What are some problems you think the earth is facing?
7. What do you do and what will you do in the future to protect the Earth?
8. Explain to me what compost is, how it is made, how it is used, and why it is used.
9. What are some advantages of growing your own food or shopping at farmers' markets over shopping at grocery stores?