



Food gardens and learning:
Investigating food gardens as tools for academic
instruction in Soweto, Johannesburg, South
Africa

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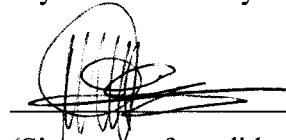
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Declaration

I declare that this dissertation is my own, unaided work. It is being submitted for the Degree of Master of Science at the University of the Witwatersrand, Johannesburg. It has not been submitted before for any degree or examination at any other university.



(Signature of candidate)

18th day of June 2018 at Wits

Abstract

Community gardens offer one strategy for responding to food insecurity, poverty and community building, and can involve a wide range of groups. There has however been less research in South Africa to date on institutional food gardens in comparison with ‘community’ food gardens. Where there has, the focus has been on gardens’ relations to feeding schemes and nutritional outcomes. There has been little investigation of the educational benefits offered by school gardens in South Africa. The purpose of this study was to investigate the relationship between food gardens and academic instruction, and how and why that varied across schools in Soweto, Johannesburg. Taking a qualitative and comparative approach, data was collected at two consenting schools using semi-structured interviews with teachers and participant observation. Using thematic analysis, my overall findings were that, while the gardens in both schools were used sometimes to supplement the food scheme or to punish students, the primary school showed some engagement with it for theoretical instruction as well as for recycling and creating compost while the secondary school did not use the garden for teaching and learning. Both schools faced a number of challenges in running their gardens as well as using them for teaching and learning. Despite these challenges, teachers, particularly newer ones, shared many possibilities of how the gardens could equip the learners with alternative skills that classroom education does not offer. With this clear interest in garden-based learning, it is worth investing in these sites through a multi-disciplinary approach and working together across garden coordinators, teachers and other involved stakeholders to realise their pedagogical potential.

Dedication

This work is dedicated to my parents, Makgakwane Moswane and Ntshekge Moswane, *ke leboga lerato le thekgo ka dinako tshohle.*

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Acronyms

ANC	African National Congress
CAPS	Curriculum Assessment Policy Statements
DBE	Department of Basic Education
FBA	Faculty of Best Advisory
GBL	Garden-Based Learning
GDE	Gauteng Department of Education
ISHP	Integrated School Health Programme
NCS	National Curriculum Statements
NGO	Non-Governmental Organisation
NSNP	National School Nutrition Programme
OBE	Outcome Based Education
PAR	Participatory Action Research
SFPS	Sustainable Food Production in Schools
SGB	School Governing Body
UA	Urban Agriculture
US	United States

Chapter 1: Introduction

1.1 Background and Problem Statement

According to Freire (1970), the role of education is to inspire and empower, to encourage critical thinking and asking questions to eventually solve problems in society. However, the current system of education, which Freire refers to as the 'banking concept', does not serve that role. It encourages learners to receive information, memorise and regurgitate it. Nor does the banking concept of education prepare learners to become creators of job or entrepreneurs (Freire, 1970).

The flawed education system in South Africa is linked to 300 years of colonisation and 40 years of apartheid which produced very high levels of inequality in society. The challenges confronting the country's economy are also linked to the inherited racially unequal education system. Along with these challenges, there is a mismatch in the economy and education systems for the skills required (Jansen, 1998). The economy must grow at an estimated 6% so that there can be more jobs. More jobs will decrease unemployment in South Africa. However, many school leavers and unemployed graduates cannot penetrate and participate in the economy because it is growing by less than 2% as recorded in the last quarter of 2017 (Statistics South Africa, 2017). 38.6% of those under 34 years of age are currently unemployed (Menon, 2017). For there to be transformation in the economy, there should be change in how the South African education system operates (Jansen, 1998).

One such transformation in the school system is to introduce Garden-Based Learning (GBL). GBL is learning through food gardens, using a food garden as an academic tool and as a living laboratory for teaching and learning (Desmond *et al.*, 2002). This form of learning provides holistic acquisition of knowledge and practical skills through interaction with the world in the form of a school food garden. The school food garden provides learners with practical learning, which is

currently lacking in the school system. The garden also provides an opportunity for lifelong learning (Antikainen, 2006).

Since 1994 in South Africa, after the birth of democracy, food gardens in general have attracted the attention of policy makers as a strategy for poverty alleviation (Möller, 2005). The fundamental challenge at hand is that the majority of people still live in poverty (55% of South Africans in 2015 (Statistics South Africa, 2017)). 25% of the population are calculated to live below the food poverty line (Statistics South Africa, 2017). This is increasingly an urban challenge: with two-thirds of South Africans urbanised, there is a growing, but less visible urban food crisis (Crush *et al.*, 2011).

Community gardens offer one strategy for responding to these various challenges. They can involve a wide range of groups such as schools, prisons, youth, elderly and local residents of neighborhoods. The term, ‘community gardens’ refers to

“open spaces which are managed and operated by members of the local community in which food or flowers are cultivated. Community gardens are not only sources of food; they have multiple benefits which include but are not limited to providing food, creating strong communities, promoting healthy lifestyle and being used as tools for learning” (Guitart *et al.*, 2012, 364).

There has however been less research in South Africa on school food gardens as tools for academic instruction. Where there has, the focus has been on gardens’ relations to feeding schemes and nutritional outcomes (Laurie *et al.*, 2017). There has been little investigation of the educational benefits offered by school gardens in South Africa.

Furthermore, there are new policy frameworks encouraging the multi-pronged use of school food gardens, such as the National School Nutrition Programme (NSNP) which encourages school food security, environmental education and GBL. However, food gardens are still under-utilised for academic purposes for a range of reasons. In order to create a new system of education that involves also practical learning and equipping learners with relevant skills, school food gardens

still have to be researched further in an attempt to solve the problems of poverty and unemployment among youth.

My honours research (Moswane, 2015) offered one such pilot study at a Johannesburg school food garden, revealing that the availability of the food garden affords garden volunteers with an opportunity to use it for academic instruction. But prior to the teachers using the garden for academic instruction, a curriculum planner should be involved to assist in terms of planning the curriculum and also to train the teachers so that they are well equipped to educate the learners. Hands-on experiential learning afforded by GBL can potentially enable learners in the long run to have necessary skills to be employable or become entrepreneurs.

1.2 Aim

The purpose of this study was to further explore the relationship between food gardens and learning at two school food gardens in Soweto, Johannesburg, South Africa. More specifically, the central aim of this research was to explore food gardens as tools for academic instruction and how and why that varied between two township schools in Soweto.

Addressing the aforementioned creates an opportunity to learn about the potential of food gardens in alternative education practices that can contribute to creating jobs and fighting poverty.

1.3 Objectives

The central aim was achieved through the following objectives:

- 1.3.1 To investigate how teachers who work in the schools use the school food garden for teaching the pupils.
- 1.3.2 To explore how school food gardens can be used to equip learners with relevant skills needed in the economy.

- 1.3.3 To investigate how garden-based learning can be integrated in the future school curriculum for pupils.

1.4 Definitions of key concepts

There are many different names and categories used vis-a-vis food gardens. In this dissertation, a number of categories will be used as they appear in the literature, including “urban agriculture”, “community garden”, “food garden”, “organised garden” and “school garden”. While the preferred term will be “food garden” or “school food garden”, it is worth briefly defining the others. In this research I will interchangeably use ‘school food gardens’ and ‘gardens within schools’ for the same purpose and meaning.

Urban agriculture (UA) can be defined as “the production of plants and tree crops and animal husbandry on plot, in open public spaces and on unused privately owned land within the city and in the peri-urban zone” (Crush *et al.*, 2011, 288). Community or food gardens are examples of the general category of urban agriculture. It is useful to further distinguish between “community gardens” and “organised garden projects” (Pudup, 2008), although most of the literature uses the category “community garden”. Community gardens

“can be a plot of collectively cultivated land, in food or ornamental crops, to which participating community members enjoy specified harvest rights or an assemblage of individually cultivated plots in an arrangement whereby participating members contribute money for water, tools, and/or general maintenance of common spaces like fences and compost bins” (Pudup, 2008, 1231).

In contrast to this more amorphous category, organised garden projects have three defining characteristics according to Pudup’s (2008) US research. Taking place in more institutional contexts such as schools, hospitals, jails, poverty alleviation projects, the organised garden project

- (a) “is brought under cultivation by a group of people and membership and/or affiliation with the group is required to participate in gardening on said space.”

- (b) “The group involved in cultivation has espoused a set of goals for its gardening practice.”
- (c) “The cultivated space is not typically devoted to third party gardening, i.e., gardening by people other than the owners of and/or custodial employees on the property.” (p.1231)

School gardens would generally fit within this category of organised garden projects.

1.5 Outline of the dissertation

The dissertation is structured and presented in six chapters.

Chapter one: this chapter constitutes the introduction and problem statement, the central aim, objectives, significance of the study as well as key definitions.

Chapter two: this provides the literature review, contextualising the research within broader urban agriculture and community food gardens histories and debates globally, in Africa and South Africa. This chapter also includes scholarly engagements with school food gardens globally and in South Africa specifically. It concludes by drawing out the study’s theoretical orientation within experiential and critical pedagogy as well as the challenges of school food gardens.

Chapter three: this methodology chapter unpacks how the study was conducted. This chapter discusses how a qualitative, mixed-methods research approach inspired by participatory action research was crafted, and why and how comparative case studies were chosen for this study. It describes the study sites, and how access was negotiated to these. Data collection methods are detailed, particularly participant observation as well as semi-structured interviews. This chapter also informs how the collected data was analysed. In the same breath, the chapter reveals challenges which the researcher was confronted with during the research process.

Chapter four: this chapter reports specifically on the recorded results of the study. It reports the themes which emerged from analysis of the conducted interviews and results from participant observation at both schools.

Chapter five: this chapter discusses the results or findings. The discussion situates the major findings in relation to policy, the scholarly literature, and in relation to the theoretical coordinates of this research.

Chapter six: the conclusion returns to the study's original objectives, and highlights both the theoretical contributions of this study as well as possible programmatic and policy recommendations from this study. It also outlines avenues for future research.

Chapter 2: Literature Review

2.1 Introduction

This chapter will situate the study in the relevant literature. Given the limited research on school food gardens in particular (despite them being the second most common group to operate community gardens after non-profits organisations in some contexts (Guitart *et al.*, 2012)), this literature review also considers sources more generally interested in urban agriculture and community food gardens. Between the years 1985 and 2011 there were about 87 academic papers published on urban agriculture. The research was mostly about gardens in North America. Out of 195 authors on food gardens, there were only three from South Africa (Guitart *et al.*, 2012). While this number has surely grown in the last five years from the previous records, the literature reviewed here draws from international, regional and South African scholarship.

The first section focuses on the history of food gardens and the early motivations. The second part of this section will cover poverty alleviation and food security in relation to food gardens. The third part of this section will focus on food gardens as a tool that enables people to experience various affective, social and health benefits. The fourth part of this section will focus around food gardens and schools. The fifth part of this section will expand on findings around school food gardens in relation to the following; nutritional education, environmental education and awareness, learning citizenship and leadership, garden-based learning, experiential learning, skills acquisition, entrepreneurship education and ultimately curricula. The sixth part will focus on the theoretical coordinates provided by Montessori's experiential learning and Freire's critical pedagogy. Finally the last part will discuss the challenges of school food gardens.

2.2 History of Food Gardens and Early Motivations

There is a well-established literature documenting the history of community food gardens in Western Europe and the United States – and how they were often responses to war, economic crises, food insecurity as well as government and

middle-class anxieties about poverty and immigrant integration (Pudup, 2008). Community gardens emerged during World War II in response to food shortages in the United States, and before the World War they were used for aesthetic purposes (Blair, 2009; Launtenschlager and Smith, 2007). In the United States at first there was negativity towards urban agriculture. Gardens were viewed as informal and difficult to regulate (Blair, 2009); however this changed as more organised garden projects emerged as part of reformist movements and urban planning agendas.

There is a smaller body of work on the history of such gardens in the African context. This might be because urban food research in sub-Saharan Africa is funded largely by international development agencies (Battersby, 2013), with more interest in contemporary matters and policy solutions than historical research. However, we know that there was generally an antagonistic relationship to urban agriculture in many African cities both under colonial and postcolonial rule, where it was seen as backward or illegal. In Nairobi for example, in the early 1960s, there was negativity towards community gardens. Firstly, it was thought that they are hiding spaces for criminals. Secondly, it was thought that mosquitos causing malaria were breeding at the food gardens; however, it was later scientifically proven otherwise (Slater, 2001).

Over the years attitudes towards food gardens changed and developing countries started growing interest for food gardens in the early 1980s (Slater, 2001). One of the fundamental reasons for introduction of urban agriculture was for the people to have means of survival. In most parts of Africa, urban agriculture grew in the 1980s when governments were carrying out IMF-imposed Structural Adjustments Programmes (SAPs) (Möller, 2005). In Zimbabwe for example, the urban poor could not afford food as food increased by 250% as a result of SAPs during the 1980s and 1990s (Drakakis-Smith, 1994).

Currently, urban agriculture in a variety of African cities is being practiced. In the country of Mozambique, the outskirts of the city of Maputo became areas of

producing vegetables and livestock. Even in Botswana, with its challenging environment, there is evidence that food production is growing (Crush *et al.*, 2011). In Gabarone, for example, the government is supporting various garden initiatives to address food security to varying effect (Fehr and Moseley, 2017). In Accra, Dakar and Kinshasa, while there is less state support, urban cultivators provide almost all leaf greens being sold and use this income to live (Oliver and Heinecken, 2017).

In South Africa, it was after the birth of democracy when both development practitioners and policy makers saw the potential of food gardens as a strategy to supply the urban poor with food and income security (Möller, 2005). Most people (30.4 million) in South Africa live in poverty (55.5% below the upper bound poverty line - these are people living with approximately R1138 per month); there are high levels of inequality and unemployment which are regarded as the major causes of poverty (Statistics South Africa, 2017). The most affected groups of people by poverty are women, children, youth and old people (Motloun and Mears, 2010). In communities which have high levels of poverty, policy makers hoped urban food gardens would provide access to food for the poorest of the poor; the stable poor are able to get food from the garden at an affordable price, and those with entrepreneurial skills are able to generate money selling food harvested in the food gardens (Rogerson, 2003; Machete, 2004).

Initially food gardens formed part of rural development; however, an increased movement of people from rural areas to the cities led to urban agriculture being a viable option for providing the poor with both food as well as income generated from selling the produce (Möller, 2005). In the same breath, South Africa does not have proper policies to address the food security issue despite the right to food in Section 27 of the Constitution. In 2008 the price of food increased dramatically and led the government of South Africa to increase emphasis on the value of urban agriculture vis-à-vis food security challenges. South Africa's National Development Plan (NDP) 2012 states that "the support of urban agriculture at the national, provincial and municipal level is significant for ensuring household food

security” (Oliver and Heinecken, 2017, 168). More recently in 2014, the South African government published a National Policy on Food and Nutrition. The policy was met with criticism by civil society organizations due to the fact that there was no proper public consultation (Battersby *et al*, 2016).

At the provincial scale, the Gauteng Department of Agriculture, Conservation and Environment (GDACE) implemented an urban agriculture-based programme which initiated community gardens for the poorest of the poor (Ruysenaar, 2012). At the municipal scale, Cape Town stands out as the only city in South African which has an urban agriculture policy. Cape Town is a municipality that supports urban agriculture by providing land access and resources. This is in line with the national view that urban agriculture can play a significant role in combating poverty (Oliver and Heinecken, 2017).

2.3 Food gardens, poverty alleviation and food security

Whether urban agriculture or community food gardens can increase food security and reduce poverty is debated in the literature. This debate is particularly loud outside the global north, where urban agriculture is often associated with more social than material benefits (Battersby and Marshak, 2013). However there are some studies investigating the relationship between community gardens and food security in the US (Corrigan, 2011). I focus on literature from the global South and Southern Africa in what follows.

In terms of poverty alleviation, some researchers argue that urban agriculture is a key livelihood strategy for poor communities in developing countries (Adu *et al.*, 2014; Slater 2001). 200 million people are employed in urban farm-related enterprise and contribute to the supply of food for about 800 million people in the whole world (Zezza and Tasciotti, 2010). In many African countries 40% of urban dwellers are participating in agricultural activities. In Latin America, it is about 50% of urban dwellers. If these statistics are accurate, urban agriculture is playing a pivotal role in urban food security (Zezza and Tasciotti, 2010). In 2011, it was estimated that about 600 million people are participating informally in urban

agriculture. Approximately 90% of fresh produce in cities such as Havana, Cuba is grown locally. Around the same percentage is produced in African cities such as Accra in Ghana and Dar es Salaam in Tanzania (Kortright and Wakefield, 2011). Urban agriculture has been adopted as a major food security strategy by poor households in countries such as Zimbabwe and Zambia. In these countries, increased household food production was a response to economic hardships (Crush *et al.*, 2011). The cash income of Zambian farmers has increased since Shoprite started sourcing from local vegetable and fruit suppliers (Emigor and Kirsten, 2009).

Urban agriculture is also capable of generating dual income for households concerned as well as providing direct access to the food produced. In some cases food gardens provide full-time employment for the people living in poor communities, with the potential of creating employment for the poor as well as providing food for the very same group of people (Rogerson, 2003). In a recent study from the Cape Flats in Cape Town, South Africa (an area populated by poor coloureds and blacks), the researchers argued that urban agriculture contributes to livelihood strategies for the urban poor, by contributing among other things to food security and building social capital (Oliver and Heinecken, 2017). However, this was a case whereby there was funding and administrative support from non-governmental organisations (NGOs) which train and support cultivators in the process. In addition, households that engage in farming may have access to comparatively cheaper and wider variety of potentially nutritious food (Zezza and Tasciotti, 2010). Citizens of Namibia have shown interest in establishing their own gardens, however, there is no policy that encourages the planting of gardens in Namibia (Dima *et al.*, 2002).

In contrast, others argue that food gardens should not be regarded as a livelihood strategy because many people can be locked in the vicious cycle of poverty as they may not get access to skills needed in the modern world (Reuther and Dewar, 2006). Poor people do not have funds to invest in tools and seeds for gardening, therefore urban agriculture should not be considered as a solution to poverty but

rather an alternative strategy (Reuther and Dewar, 2006). ‘The poor’ are also differentiated: the extreme poor and new migrants to the city do not have access to land and also move around frequently, making it difficult for them to participate in urban agriculture (Crush *et al.*, 2011). Research has proven that it is the wealthier households which get more benefits out of participating in urban agriculture than their poorer counterparts, and again poor households do not get access to major economic and food security benefits (Wills *et al.*, 2010; Frayne *et al.*, 2014). This is especially the case in places like South Africa where agro-food value chains are liberalised and highly concentrated (Battersby *et al.*, 2016). South Africa’s 2013 Department of Trade and Industry’s Industrial Policy Action Plan and the Department of Agriculture’s Agro-Processing Strategy have put in place programmes to increase the participation of small and medium agro-processors in agro-food value chains in an attempt to move people out of poverty and increase their economic participation through food production. Yet the existing evidence suggests that the policies will be successful only if there is stronger regulation of the system in its entirety (Battersby *et al.*, 2016).

Urban agriculture’s effects on food security and hunger is also debated. Food security is “a situation that exists when all people, at all times, have physical, social and economic access to sufficient, safe and nutritious food that meets their dietary needs and food preferences for an active and healthy life” (FAO, 1996). The global challenge is that approximately 815 million people in 2016 were living in hunger; they do not have enough food to live a healthy lifestyle (FAO, 2017). In South Africa 30.4 million people were living in poverty in 2015, of which 13.8 million were living in extreme poverty below the food poverty line (Statistics South Africa, 2017). There are number of reasons for that. Firstly although food is produced in large quantities, it is not equally distributed. Secondly, the rapid rise of food costs as well as global climate change makes it difficult for population of the world to have enough food (Blom, 2014). There is also the challenge of urbanisation: just above 50% of the world’s population is currently situated in urban areas resulting from rapid movement of people from rural to urban areas. As a result of this migration, people consume food which has been transported for

long distances as well as less nutritious, processed food because they do not have the space and time produce their own. These increasing food prices as well as poor quality food have sparked interest for people to grow their own food in urban spaces of community gardens (Guitart *et al.*, 2012), as well as governments to promote urban agriculture.

For some local researchers, urban agriculture increases food security. In one Cape Town study, urban agriculture was revealed to promote and supplement food supply. The study of which the majority (85%) of cultivators were Xhosa women above 40 years, and colored women contributing (12%), and small percentage (3%) being black Zimbabweans, was focusing on personal and social perspectives of the cultivators (Oliver and Heinecken, 2017). Organic cultivation was encouraged by the involved NGO, who encouraged cultivators to make their own compost - this is beneficial since it saves money and contributes to sustainability of the project (Oliver and Heinecken, 2017). In Johannesburg, Wills *et al* (2009) find that the Siyakhana project—established in 2006 by Wits University Health Promotion Unit together with city authorities—proved to aid food security, especially vis-à-vis the World Health Organization's (WHO) findings that fruit and vegetable consumption are low in South Africa (Wills *et al.*, 2009).

For other researchers, the contribution of urban agriculture to food security is more ambiguous. In reviewing research from Southern African cities, Crush *et al* (2011) argue that urban food production is not very significant to food security for the urban poor in South African cities. It does not contribute a lot in terms of food supply and only a few earn money from selling the produce. The majority of families depend on food purchased from informal sector and supermarkets (Crush *et al.*, 2011). There are a variety of empirical case studies demonstrating low levels of agricultural production (Beery *et al.*, 2014, and Oliver and Heinecken, 2017), for a range of reasons: from gendered water access (Fehr and Moseley, 2017) to lack of institutional support (Drimie and Ruysenaar, 2010). For example, scholars argue that along with providing insufficient food, urban agriculture is

unsustainable, even in places where there is support from NGOs (Battersby and Marshak, 2013).

That said, these relationships differ across contexts (Frayne *et al*, 2014). More generally, Battersby (2013) argues that ensuring food security is far broader than focusing on urban agriculture. The problem with focusing only on urban agriculture is that it depoliticises food security, shifting the responsibilities of economic adjustments from the government and corporate sector to the struggling masses of our people who must adopt their own coping strategies (Battersby, 2013). However, people's needs are not only limited to food and water - happiness and fulfilment are important needs that have to be met also for a society to function and be empowered. The following section will discuss the affective and social benefits of food gardens.

2.4 Affective, social and health benefits of food gardens

While government tends to frame the benefits of urban agriculture in economic terms (Oliver and Heineken, 2017), the benefits of food gardens extend far beyond being a source of food or livelihood. In their international literature review, Guitart *et al* (2012), the most popular benefits reported across community garden research include but are not limited to eating fresh produce, social cohesion, saving money, selling food, and improving health. Education, cultural practices, environmental sustainability as well as spiritual achievement are also reported but are not the most popular (Guitart *et al.*, 2012).

Since food is important to all people, it can unite people from different backgrounds. Food gardens can help tackle issues of poverty, racism, class and injustice, as the US literature particularly has demonstrated (Heynen *et al.*, 2012). Food gardens relieve people from boredom and give them exercise (Adu *et al.*, 2014). Food gardens heighten motivation and enthusiasm; improve one's sense of self-worth, team work and parental involvement (Blair, 2009). Community gardens can also 'grow' a sense of citizenship (Ghose & Pettygrove, 2014).

In a range of South African case studies, participation in food gardening is reported to have capacity to build both social capital as well as human capital, as Oliver and Heineken (2017) find in their study. Battersby and Marshak (2013) also find that gardening is capable of changing people and places; the process of gardening is a channel to increase a sense of self-confidence. Community gardens are also reported to reduce stress levels. Urban agriculture also assists in creating a safe space for immigrants, such as the population that was affected by the 2004 tsunami (Battersby and Marshak, 2013). Other studies by Adu *et al.* (2014), Blair (2009) and Rogerson (2003) concur that community gardens increase individuals' sense of self-worth, motivation, and of course sense of fulfilment and achievement during harvest.

One other major contribution of food gardens in society is their capacity to build a sense of belonging and stable communities. For example, in Reuther and Dewar's (2006) study, women of Khayelitsha, Cape Town reported that they find refuge in the food garden from fear of violence and they are also able to create social cohesion and encourage mutual support, more especially for newly-arriving migrants. Newly-arriving migrants at Khayelitsha were able to feel part of the society because of the food garden, hence it is said that food gardens strengthen community networks (Reuther and Dewar, 2006). These benefits are equally important to the financial benefits obtained when selling fresh produce from the garden (Möller, 2005). Community gardens have also been reported to have the capacity to urge public participation in problem solving as well as creating civic pride (Launtenschlager and Smith, 2007). In the Joburg Siyakhana case, participants viewed the garden as having health benefits: women learned about herbs which they could use for minor ailments (Wills *et al.*, 2014).

Some scholars are more skeptical of these changes: in the US, Pudup (2008) investigates how gardening projects have been specifically designed as spaces of personal, rather than structural, transformation, whereby people are expected to change their own material conditions economically and socially by using modern technological resources (Pudup, 2008). Ghose and Pettygrove (2014) question

how citizens' participation in volunteerism may support the intentions of local state policy, in particular in the context of neoliberal policy, because the state will only support programmes in line with their policies and sideline programmes with different perspectives (Ghose and Pettygrove, 2014).

Pudup (2008) also problematises the assumption of 'community' in community garden. In the Cape Town context, Battersby and Marshak's (2013) study of urban agriculture in two neighborhoods, Vrygrond and Seawinds, community food gardens are not always socially acceptable to 'the community'. Simatele and Binns (2008) and Drakakis-Smith *et al* (1995) find that urban agriculture has not been welcomed on the basis of posing health threats, with regards to polluted water for farming causing cholera, and other polluted water sources seen as breeding grounds for malaria. Furthermore, urban agriculture is seen as old-fashioned and undesirable, and hence the youth distanced their involvement and participation (Battersby and Marshak, 2013). Möller (2005) also found something similar about the perceptions that young people have about gardens. Gardens suffer from an image perspective; they are associated with hard work, as well as dirty work. The youth that were interviewed confirmed that they are interested in the glamorous and fast life (Möller, 2005). In the following section, I will focus on food gardens for feeding schemes as well as garden-based learning.

2.5 Food gardens and schools: from feeding scheme to garden-based learning

School gardens offer a particular type of food garden and 'organised' gardening project (Pudup, 2008). Internationally, they have a long history. In the 17th century John Ames Comenius (1592-1670), known as the father of modern education and an adviser to governments as a teacher with a Christian background, had a strong belief that education should be practical, innovate as well as universal. He added that school gardens should be part of the school curriculum and children should be taught to love and appreciate nature (Smith, 2017). In South Africa, school gardens' history is less well documented, but they have been organised currently with a number of functions in mind. First, feeding schemes based on school

garden produce are regarded as a viable solution to food insecurities and fighting hunger among learners. Food gardens also assist with additional potential income generation for schools. And finally, they offer a site for garden-based learning.

The first has dominated in practice, and in the literature. Historically, we know that in 1943 there was an announcement that all school children in South Africa were to be afforded a free single meal per day as per the instruction of the Department of Social Welfare (Bhorat, 1995). Following the announcement, two years later racial discrimination was strengthened from 1945, as African schools were placed in the Union Education Department. Unlike Indian, white and coloured schools, there was no subsidy for African schools (Bhorat, 1995), which meant that school feeding programmes were suspended therein.

Non-racial feeding schemes were (re)introduced by the African National Congress (ANC)-led government after 1994. To achieve a healthy school food environment, the existing policy framework is in the form of Integrated School Health Policy (ISHP), which is managed by both the National Department of Education and National Department of Health (Laurie *et al.*, 2017). Since 2008, the National School Nutrition Programme (NSNP) is managed by the National Department of Basic Education (DBE). It is a national level programme funded by government to offer schools in quintile one to three with meals (Laurie *et al.*, 2017). The programme has three pillars: the first one is a feeding scheme programme for providing meals for the learners, the second one is a natural education programme promoting healthy lifestyles and eating, and the third one is called Sustainable Food Production in Schools (SFPS) which encourages production of food as well as transfer of skills (Laurie *et al.*, 2017). As part of this, the schools are highly encouraged to grow food gardens so that both educators and learners can grow vegetables and fruits (Laurie *et al.*, 2017). There has also been a Nutrition Education Manual developed for schools, as an educational tool for training learners, garden workers, teachers and demonstrators. The manual focuses on the following headings: nutrition at a glance; the nutrients we need; health and unhealthy food; fruits and where they come from; factors influencing food intake;

water, food safety and hygiene; dietary hygiene. The manual has spaces for notes, and it also has practical questions. The manual is developed by policy makers and education practitioners to ensure that the population of South Africa is informed about healthy eating and is made available to some schools, however it has not been introduced widely. In collaboration with the DBE and National Department of Health, the Department of Agriculture is becoming more involved in food gardens since from 2015 (Laurie *et al.*, 2017). There is also a need to train educators and administrators (Laurie *et al.*, 2017). Aside from school gardens' contributions to feeding schemes, the other two pillars of the NSNP have received less scholarly attention so far.

In one of the few case studies of school food gardens in Johannesburg, Beery *et al* (2014) studied a school garden which was established by the City of Johannesburg to respond to food insecurity and environmental sustainability. The study was carried out in two schools. It found that although gardens did not yield enough vegetables to feed the learners; the garden was able to change perceptions of learners by encouraging healthy eating (Beery *et al.*, 2014). The food garden improved the behaviour of learners in and outside the classroom; it also presented children with learning disabilities the chance to learn in the garden (Beery *et al.*, 2014).

This points to one of the many educational motivations behind school gardens. In reviewing the substantial US literature on children's and school gardening, Blair (2009) introduces us to a range of motivations and outcomes. At first school gardens were a way to educate children about natural science, promote the appreciation and beauty of nature, and to develop civic pride. The gardening process was also a strategic way to promote curiosity of children. There were varying perspectives: those who supported the view of showing the beauty of natural environment by learning about the abiotic factors, in particular the plants and flowers, and those who wanted gardening programmes to instill discipline in unruly juveniles (Blair, 2009). In what follows I attend to literature on this range

of educational motivations and outcomes, from nutritional to environmental to experiential learning.

School food gardens and nutritional education

Scholarly literature suggests that nutrition is a critical aspect of a child's development and well-being. Nutrition plays a significant role in a child's ability to learn. Nutrition is important for teaching about healthy living and eating as well as to encourage learners to have their own food garden (Laurie *et al.*, 2017). However, improvement of nutrition by increasing fruit and vegetable consumption is complex to measure because of the evidence required to demonstrate such (Guitart *et al.*, 2012). School gardens are instrumental for both gardening as well as healthy eating: when learners are involved in gardening activities, their knowledge about vegetables increases; so does their consumption of vegetables (Laurie *et al.*, 2017).

School food gardens and environmental education and awareness

Environmental education is an education for, about, in and via the environment (Le Grange, 2002). According to the North American Association for Environmental Education (2002): "Environmental Education is a process that aims to develop an environmentally conscious citizenry that can compete in our global economy, have skills, knowledge, and inclination to make well-informed choices, and exercise the rights and responsibilities of members of the community" (Desmond *et al.*, 2004, 11). Interactive theories are of the view that science and other forms of learning take place through participation of learners in the social as well as natural processes taking place in particular place at a particular time (Desmond *et al.*, 2004).

At first when nature and farms formed part of the daily life of humanity, almost all young people were able to access them (Blair, 2009). However, recently television and video games have taken the place of supervised environmental education in many households in the U.S. Children today lack exposure to the

natural environment as they spend more time indoors (Blair, 2009). School food gardens have long been lauded for their capacity to develop skills and knowledge, but more recently they have gained attention with regards to spreading health and environmental consciousness (Cairns, 2017). The benefits of food gardens include increases in learners' achievements, natural knowledge and a sense of inclusion and caring (Cairns, 2017). This also changes children's eating habits and attitudes which will help change the food system and connect children to nature (Cairns, 2017).

School food gardens and learning citizenship and leadership

The intention of school food gardens is to offer new ways of teaching and learning, to offer environmental education that encourages community service, leadership and life skills for participating young people (Klemmer *et al.*, 2005).

Other studies reveal that the more learners participate in food garden, the more they are likely to feel like active citizens and regard themselves as change agents, as people who can bring about positive change in their own lives, the lives of their families and communities (Adu *et al.*, 2014).

School food gardens and garden-based learning (GBL)

GBL programmes use both classroom as well as garden-related activities to teach. Learners grow, harvest and in most cases consume the products from the school garden. Educators use garden-based education in subjects like sciences, environmental studies as well as physical education (Desmond *et al.*, 2004). There is however, no universal model for GBL, but in most instances it is used for science teaching (Dirks and Orvis, 2005). Each and every community must come with its own model to address its problems and to satisfy needs of its society (Desmond *et al.*, 2014).

GBL can shift the perceptions of learners, workers and teachers towards the environment. Their knowledge and attitudes towards the environment can change

and become positive. GBL also encourages a sense of environmental responsibility and can lead people to positive action (Wang and Glicksman, 2013). GBL has been shown to improve self-confidence, self-esteem as well as a sense of appreciation. GBL can also better the relationships not only between students, but also between students and teachers. In instances where the garden is used as a teaching environment, it can become more open than the classroom which is closed and hostile; therefore, the garden space can be more relatable (Dirks and Orvis. 2005). Using a school food garden to teach needs a multi-disciplinary approach and working together by garden coordinators, teachers and other stakeholders (Laurie *et al.*, 2017).

In many California schools, food gardens are used for teaching purposes. As a result of convincing evidence that environmentally-based education improves performance for learners' interest in learning as well as attention spans, it has led the government of California to make an informed decision that in the long-run every school of California should have a garden (Graham *et al.*, 2005). The food gardens are used for teaching and learning science, environmental studies as well as nutrition. 13 years ago the study of Graham *et al* (2005) found that gardens were primarily used for teaching purposes, and yet there were no curriculum materials and teacher knowledge in this area (Graham *et al.*, 2005). However, this is different from what is happening in South Africa where school gardens are primarily used to address hunger and poverty issues in schools where the gardens are situated, although not all the time and in most instances, it is difficult to quantify how the gardens address poverty. South Africa has however recently developed new material for teaching using schools gardens which needs to be utilised (Laurie *et al.*, 2017).

School food gardens and experiential learning

Experiential, inquiry-based learning is the type of learning that occurs by engaging directly with the natural environment. Kellert is of the view that since nature changes very fast, it catches the attention of children (in Blair, 2009). Hands-on learning can be incorporated in all other areas of curriculum to foster

environmental awareness as well as increased interest in science (Dirks and Orvis, 2005). From studies conducted, it was shown that it is experiential learning, and not gardening that improves a child's use of advanced mental skills. Although there are varying experiential learning which may slightly differ, "[t]he difference between a structural discrete experiential learning experience and a long-term involvement in a gardening process resides in the multitude of instructed learning opportunities that are not in the lesson plan, happen spontaneously and involve students" (Blair, 2009).

When children experience nature, they become provoked to enquire about what they experienced and make sense of it (Blair, 2009). School gardening is significant and dynamic because it enables education to occur in an unusual and unconventional manner through being hands-on and outdoors, though this may be seen as unpopular, more specifically by teachers who prefer conventional way of doing things and are not prepared to challenge the status quo (Blair, 2009).

School food gardens and skills acquisition

Participating in garden activities equips people with diverse but specific skills and practical knowledge. Participating in garden activities enables participants to learn how to plant, as well as how and when to irrigate specific crops. The people who work in the garden learn how to prepare the organic manure, rotation of crops as well as crop behavior. They also learn about soil. These are skills which are critical and can only be acquired in a garden setting because it is practical education (Adu *et al.*, 2014). In most African schools, there has been no or little curricular emphasis on practical skills. However, there is a shift as seen in Niger's educational policy which prioritises gardening as well as Sierra Leone whereby approximately 80 percent of all schools in the country have hands-on-garden class. After children have learnt about gardening at school, there is high probability of them assisting their parents with their home gardens, because they have already been taught at school about gardening (Desmond *et al.*, 2004).

A food garden study in Johannesburg proved that food gardens offer lot of benefits vis-à-vis skills. Children acquired various life skills such as communication skills, cooking skills, financial and enterprise skills, team work, problem solving skills and other skills which can position them to strategically be employable (Beery *et al.*, 2014). On top of the skills acquired by the children, they also improved in confidence, resilience and self-esteem, and they were also motivated for school and learning. They did their homework and completed their school work. However, this way of learning will also depend if the learners are interested in gardening (Beery *et al.*, 2014).

Food gardens and entrepreneurship education

With entrepreneurship education (E-ed), the productivity of teaching is not measured by the number of students graduating, like in other disciplines. However, it can only be monitored by the socio-economic impact that the successful programme produces (Rideout and Gray, 2013). Small businesses have been recently identified as a strategic sector for economic growth and are currently creating more jobs than bigger companies. There are approximately four million new businesses which are created every year globally (Rideout and Gray, 2013). The fundamental question posed by both policy makers and economic developers is, “how can we get more entrepreneurs to create more new jobs” (Rideout and Gray, 2013).

According to Rideout and Gray (2013) education institutions generally discourage entrepreneurial attributes and behavior. In the United States, in many cases teachers of primary school discouraged creativity, critical thinking as well as a questioning tendency to life in their classrooms space by learners. Children who question are discouraged and those who accept things as they are, are preferred. In most instances at post-secondary level, colleges and universities focus on producing students or graduates to be good employees of organisations as the only career choice. Those who enrol for E-ed course are not taught fundamental skills to flourish as entrepreneurs (Rideout and Gray, 2013).

Food gardens and Curricula

A curriculum represents how academic ideas are practiced. Curriculum is a word that is derived from Latin and it means a race course. Curriculum in this research is how education is planned and executed (Prideaux, 2003). There is currently a more accepted definition of curriculum which encompasses all the learning experiences planned for a particular school or educational institution. The curriculum must be designed in a way that can be communicated to the people it is designed for, there should be room for it to be critically engaged, and above all it should be something that can be executed immediately. The curriculum is made of three parts; there is first a curriculum that is made for students; secondly, what the students are taught; thirdly, what the students experience (Prideaux, 2003).

Work in food gardens can be integrated and used to improve the already existing school curriculum because school gardens have the potential for changing school learning environments for the better. Gardens improve school learning curricula by offering hands-on learning and the practical side of theory. Practical learning is the best way of learning to understand the complex world we live in and our role in it (Ratcliffe *et al.*, 2011). A curriculum is often produced by the urgency of people. This includes but is not limited to values and beliefs of what students should learn, and how to learn it. A curriculum has four elements: it has content, forms of learning and teaching strategies, assessment processes, as well as evaluation processes. These processes are designed with a logical order and that is known as curriculum design (Prideaux, 2003).

In 1890s America, progressive educators like John Dewey came with new ideas on how to bring learning and society together. In making a connection between classroom learning and the natural environment, Dewey was encouraging teachers to bring together intellectual as well as practical aspects of curricula. In the US context, school gardens introduced science into public schools (Blair, 2009). In other countries like Denmark for example, they introduced a new curriculum in 2014 that demands that there should be more physical activity of young people in school. Singapore has physical education activities which are a compulsory part of

outdoor learning (Gilchrist *et al.*, 2017). Teachers benefit from outdoor activities, they can be creative. There is a lot of evidence on the benefits of outdoor education, including educational achievement, improved attitude, health benefits and social cohesion (Gilchrist *et al.*, 2017). In the UK in particular, teachers spend less time outside so that they can put more focus rather on subjects that are measured in standardised tests, despite research having concluded that standardised education systems reduce levels of mental creativity and innovation (Gilchrist *et al.*, 2017).

In 1996 about 13% of public schools in California had gardens and 85% of the school used gardens for academic instruction, for subjects such as science, environmental studies and agriculture (Graham *et al.*, 2005). In the state over 200 schools, about 100 teachers as well as 11 000 learners participate in gardening as per the state curriculum. The state achieves this with partners like Natural Garden Association which provides teacher education. In Texas and California school gardens are a state-wide movement and it has been like that for the past 20 years; the state department of education as well as university extension programmes have encouraged school gardening through provision of curriculum and educational research (Blair, 2009).

In South Africa, basic education is an education that offers a foundation in academic skills, and increases thinking capacity through a curriculum that provides mathematics, science, languages and arts in most cases (Desmond *et al.*, 2004). After South Africa's transition in 1994 from an Apartheid state to a democratic state, the Department of Education brought three curricula programs, in particular for schools. The primary reason was to replace the old, outdated and oppressive Bantu education which was designed to prevent black people from participating economically and academically at strategic positions, since they were racially excluded. Previously in the old education system it was only what the teachers said, the content of the course as well as the textbook which was significant. Learners had to listen to teachers but did not engage; learning was

memory based, and learners respected what they learned despite not understanding it (Jansen, 1998).

Following South Africa's first ever democratic elections in the year 1994, the government took a stance to democratise education and equally address the past injustices of apartheid by eliminating inequalities in basic education. The first democratic government came up with the most comprehensive reform called Outcome Based Education (OBE) (Jansen, 1998). The significance of OBE was to improve the quality of education as well as to meet the demands of an increasingly skilled workforce. OBE is also a learner-centred approach whereby greater emphasis is on what the learner should learn, understand and eventually demonstrate and not on what teachers intend to achieve (Jansen, 1998). OBE is linked to B.F. Skinner who is a behavioural psychologist, while some attribute it to Benjamin Bloom with Mastery learning and Ralph Tyler who has done work on curriculum objectives. However, the language of interaction associated with OBE was very difficult, not clear as well as contradictory (Jansen, 1998). This is because teachers were sidelined when developing OBE; the other major challenge was that most teachers did not know what OBE was, and did not have information (Jansen, 1998). OBE was predicted to fail because it was driven by political agendas (Jansen, 1998).

OBE was later replaced by Curriculum 2005 and Curriculum 2005 was amended to the National Curriculum Statements (NCS) implemented in 2007, which was replaced by Curriculum Assessment Policy Statements (CAPS) in 2012. The aforementioned curriculums do not include practical and experiential learning.

2.6 Theoretical coordinates: Montessori and Freire's critical pedagogy

The previous section focused on the literature of food gardens with regards to curricula and it was clear that in South Africa in particular, the curriculum lacks the practical aspect. In this section I look at the proponents of emancipatory education and experiential learning as a foundation to incorporate their thoughts to this study.

Maria Montessori (1870-1952) was among the very first teachers to realise that children are experiential learners. She created child-centered classrooms, which were spaces where learners can create and form their own knowledge. She initially worked with poor children in Rome, Italy. She argued that teaching children in the garden will make them think intelligently and creatively and also to value education. Children working in the garden are being prepared for household duties which are significant for their survival (Alexander *et al.*, 1995).

Another critical educational theorist was Paulo Freire, a Brazilian who was sent to exile in 1964 by the Brazilian leaders and military because of his revolutionary ideas, he was seen as a threat and was then jailed and sent to exile in Chile. He was the director of the University of Recife Cultural Extension Service that offered literacy programmes to a vast number of peasants; the peasants were empowered beyond getting writing and reading skills, they were inspired to have hope and believe that they can change their situations. Paulo Freire's work was on the education of illiterate adults of the world. He critiqued the "banking" concept of education currently in use as an instrument of oppression, whereas he offered the "problem posing" concept of education as an instrument of liberation (Freire, 1970).

With banking education, teachers deposit knowledge to learners; education is the depositing act. The students are receivers and the teachers are depositors. This form of education considers learners as people who know nothing and the teachers are considered as supervisors (Freire, 1970). The intentions of banking education are to reduce the creative and innovative powers of learners to serve the interest of oppressors, who have no intentions of changing the system because it benefits them. Very often the teacher engages topics foreign to learners because the primary role is to teach. Emphasis is placed on memorising words and numbers (Freire, 1970).

In distinction, humanist revolutionary teaching encourages students to engage in critical theory to challenge themselves. The objective of problem-posing education is to alert the true humanists to the fact that they cannot use banking educational methods in pursuit of liberation, for they would only negate that pursuit. Nor may a revolutionary society use the tools, tactics and resources of the oppressor to liberate themselves (Freire, 1970). Problem-posing education sees people as beings that are work in progress, still in their journey of becoming (Freire, 1970). For Freire, education is something that is produced by constant and consistent practice. Problem-posing education brings hope to the oppressed, it liberates the oppressed. It says that men and women can transcend themselves, they can move forward and look ahead (Freire, 1970). The pursuit of full humanity, however, cannot be carried out in isolation or individualism, but only in fellowship and solidarity. No one can authentically be human while they prevent others from being fully human. Problem-posing education is a humanising and liberating project. It also allows people to overcome their false perception of reality (Freire, 1970). Overall,

“Problem-posing education, as a humanist praxis posits a fundamental view that the people subjected to domination must fight for their emancipation. To that end, it enables teachers to be one subject of the educational process by overcoming authoritarianism and an alienating intellectualism, it also enables people to overcome their false perception of reality- Problem-posing education does not and cannot serve interests of the oppressor. No oppressor could permit the oppressed to begin to question ...” (Freire, 1970).

In summation, both Freire and Montessori view education as a liberating tool. It is therefore important to incorporate the thinking and approach of these thinkers in creating curriculum for garden-based learning.

Enacting critical pedagogy through food gardens – an example

A South African organization that is making use of liberatory educational pedagogy through urban agriculture is SEED, based in one of the historically disadvantaged townships of Cape Town, Mitchells Plain. They describe their work as follows:

“SEED is an award-winning public benefit organisation that contributes to Cape Town’s resilience through awakening the potential of our unemployed

township youth; connecting them to their strengths, the positive resilience action they can take in their lives and also to green jobs” (SEED, 2018).

With youth at the centre of environmental sustainability for SEED, they believe that by creating a connection between youth and environment, the youth become equipped with the necessary skills to access opportunities in the Green Economy as a strategic move to grow communities, cities and the country (SEED, 2018).

Since 2000, SEED has been in the forefront of growing Outdoor Classrooms in under-resourced schools in South Africa, increasing ecological literacy, and more importantly increasing organic food for pupils and their communities (SEED, 2018). SEED has reached 33,796 learners, trained 987 teachers, as well as 118 unemployed youth with 68% seeding future graduating to work. In addition, the organisation has built 13 climate-adapted houses and distributed 4,695 text books (SEED, 2018). In 2013, SEED launched the food freedom movement which led to the establishment of home gardens in 238 homes grown by empowered and supported community members (SEED, 2018).

The SEED model offers an opportunity to replicate and roll-out the project in other provinces and cities of South Africa as it is currently based only in the Western Cape. The challenges are resources for making this possible, but commitment of government and other stakeholders can make this possible. The following part will address challenges affecting school food gardens.

2.7 School food garden challenges

Many of the published pages internationally discussed challenges facing community gardens more broadly. For US gardens, the greatest challenge was for future land access. The greatest obstacles for using the garden for academic instruction are: time, lack of funding, lack of curriculum material for garden-based education, as well as lack of teacher interest, knowledge, experience and training for food gardening (Graham *et al.*, 2005; Guitart *et al.*, 2012). In other parts of the world the reported challenges were lack of water, lack of safety, crime, as well as

soil contamination, lack of knowledge, volunteers and volunteer managers dropout due to lack of funding (Guitart *et al.*, 2012).

A parent volunteer or a garden coordinator is very crucial for sustaining the garden (Graham *et al.*, 2005). A garden coordinator is a person who works in the garden; the person may either be paid or volunteering to sustain the gardening facility, equally if school administrators want to develop, maintain, sustain as well as use food garden, there are things to consider; first there should be a creation of committee (constituting of teachers, school administrators, garden coordinators and parent volunteers), and the team must cooperate.

Despite school food gardens having the potential to meet the food needs of learners, volunteer workers and teachers, in most cases in South Africa they do not function for a period of more than one year due to water scarcity, lack of training, lack of interest from community members, lack of fencing to prevent theft and vandalism, poor soil quality, harsh climatic conditions, pest and disease infestation, lack of support and commitment from School Governing Body (SGB), seasonality on planting as well as failure to connect school garden with other core environmental and extra-curricular activities (Laurie *et al.*, 2017). This is also because every school differs according to leadership, parental participation and community involvement (Beery *et al.*, 2013). In addition, another challenge is that during the school holidays, gardens become abandoned as teachers go on leave and volunteers visit their rural homes. Although not all schools have capacity to maintain food gardens, support should be sought from NGOs to sustain school food gardens (Laurie *et al.*, 2017). Both teachers and principals are significant for the success of school food garden. However, more needs to be researched about the role of principals in garden-based learning. Major concerns are lack of personal interest and limited capabilities, knowledge and time (Blair, 2009).

Old Systems

Gardening has been identified to have a stigma. It is linked with an old-fashioned lifestyle, as well as back-breaking and laborious work (Möller, 2005). Möller

writes about the different perception of both younger and older gardeners. The study was of 20 active older gardeners in rural Eastern Cape province of South Africa in a small town. The older generation listed reasons for growing food that included aesthetic purposes, morality, health and well-being, and also they mentioned that the young generation aspires to live a modern lifestyle which excluded gardening, and this view was cemented by follow up questions with young people (Möller, 2005).

2.8 Conclusion

This chapter has worked to contextualise the research with broader urban agriculture and food garden debates, as well as scholarly engagements which included but not limited to the theoretical coordinates offered by Freire and Montessori, opportunities with using food gardens for learning and teaching, and challenges thereof. In the following methodology chapter, I will unpack how the study was conducted.

Chapter 3: Methodology

3.1 Introduction

This chapter focuses on the research methodology. The research was conducted using a qualitative approach and comparative case studies of two schools in Soweto, Johannesburg, South Africa. The first section of the chapter provides a brief background of Participatory Action Research (PAR) – the methodology which inspired this study’s approach. In practice the limitations and constraints of a Masters’ short time frame meant that this study ended up taking the form of a more conventional mixed methods approach, rather than a PAR approach. However, I share some of the methodological inspiration from PAR before discussing a mixed methods approach. The second section will outline the research design, which encompasses the rationale for comparative case studies, study site and case selection. The process of negotiating access to the study sites is also discussed, along with details of how sampling took place. The third section addresses data collection and the methods used in this study. The fourth section will outline the methods of data analysis and interpretation used, as well as the study’s validation. The last sections will consider ethical considerations as well as its timeline and methodological challenges.

3.2 Methodological inspiration: Participatory Action Research

Participatory Action Research, also known as PAR, is a way of data gathering which embodies the lived experiences of people most directly or indirectly affected by challenges in their communities (Checkland and Holwell, 1998; Kindon *et al*, 2007; Ozanne and Saatcioglu, 2008). PAR is highly suited for environmental and social science research. Although PAR usually requires setting questions with the participants, for this research the questions were pre-determined by the researcher due to time constraints for a Master’s programme.

In PAR, the researcher goes to an area that is confronted with a real-world problem with the ultimate aim of solving the problem with the people and also to acquire knowledge (Checkland and Howell, 1998). A psychologist known as Kurt

Lewin (1890-1947) was the proponent of PAR; he used this to learn about groups of people and how they can bring about change (Checkland and Holwell, 1998). In my case, I also went to the schools and attempted to work with the teachers to solve their challenges in line with the research objectives.

PAR includes equal participation. Excellent PAR is critical and transformative. The participants also become active informants (Kemmis, 2006). When using PAR as a researcher, you are required to observe, analyse and most important of all to come up with theories of social practice, which can then be employed after the research project (Brydon-Miller *et al.*, 1997). This approach enables ordinary people to participate with scholars in the creation of knowledge from different perspectives in an educational process of empowering all participating individuals to change themselves, their relationships with each other as well as their world (Ehrhart, 2004). The approach however, cannot be repeated because people have different backgrounds and histories; it is difficult to transfer the outcomes of the research to another group of people. Researchers using PAR acknowledge that societies are always evolving; it is up to the researcher to decide if the chosen approach has yielded enough important learning and interaction for the research conducted. The researcher in this case has to define the set of ideas employed and how they were used so that their research can make sense to everyone (Checkland and Holwell, 1998).

PAR leads to richer and more reliable outcomes of the research since the researcher is doing the research with the clear intentions of bringing change. The participants develop trust with the researcher/s and are willing to share. The researcher/s also learns and understands the participants and their realities by participating in their struggles. PAR is non-extractive because it is beneficial to all stakeholders involved (Ehrhart, 2004).

I was inspired to attempt to use PAR because I wanted first not just to contribute to knowledge production, but to also produce knowledge that can be used to transform the space the research is conducted in and possibly beyond. Secondly, I

wanted to bring about meaningful change to the community, and of course also at national level with respect to policy transformation. I also wanted to empower myself as well as participants with knowledge and skills acquired through the research study as well as with the final project of knowledge produced.

3.3 Research Design

Due to the limitations and constraints mentioned in 3.1, in practice, the research used a mixed methods design, with a PAR sensibility. This involved mixing methods to produce rich, textual and multilayered information (Gabb, 2009). Mixing methods helps us to think creatively about social experiences as well as lived realities. For example, with qualitative logic cases, context and situations can be compared (Mason, 2006). I will be comparing cases of schools. I used a combination of different methods which included interviews and participant observation (see section 3.4).

Rationale for comparative case studies

To answer the research aim and three research objectives, this study was designed around comparative case studies of a number of schools in Soweto. Comparison is a way of thinking which is dependent on principles of similarities and differences. Comparisons are mostly competitive and never neutral. This enables learning from different experiences and was a useful approach for this research (Felski and Friedman, 2013).

However, which cases to compare and which are comparable—like with like; extreme opposites; best and worst, etc.—is a question that has long occupied scientists and social scientists. This has usually been related to questions of validity and generalising out of one's case studies. However, Gobo (2008) points to the idea that there is a possibility to find cases that are significant and represent somehow the important parts of the research. In this case then the researcher does not generalise about the case at hand, however, the significant aspects that form part and parcel of the researched cases are drawn out (Gobo, 2008).

Related to new approaches to case studies, in urban studies and urban geography recently there has been a (re)turn to comparison. Geographer Jenny Robinson (2016) has argued for new ways of comparing that are not limited to comparing for example places; rather, comparison should be about connecting aspects or features of places. This will allow for comparison to happen broadly (Robinson, 2016). Furthermore, she advocates for comparing processes or places anywhere – ‘ordinary’ cases, rather than just exemplary ones. We can learn new things from these juxtapositions.

Study Site

The place or site my study focuses on, and from where I draw my comparative case studies, is Soweto, which stands for Southwestern Townships situated south of Johannesburg (Figure 1). Soweto falls within the municipality of Johannesburg Metropolitan council in the province of Gauteng, South Africa (StatsSA, 2011). Soweto is home to almost half (43%) of the population in Johannesburg (Harrison and Harrison, 2014). It is also the largest township in South Africa, covering 150 square kilometers (Griffith, 2017). It has a subtropical climate and reasonable rainfall (Climate-Data.org, 2018).

Soweto has a population of approximately 1.3 million people, encompassing great social differentiation. Along with a growing middle class, the City of Johannesburg estimates that between 600,000 and 1 million residents could be considered as “‘living in abject poverty’” (2011 in Harrison and Harrison 2014, 293). The area is populated by majority black households, and all South African official languages are spoken – for a range of historical reasons. It is a township that was socially engineered by segregationist policies and then apartheid urbanism to warehouse black residents of Johannesburg in ethnically zoned neighbourhoods (Bonner and Segal 1998 in Harrison and Harrison 2014, 296).

Soweto and its schools came to the limelight historically on the 16th of June 1976 during the Soweto Uprising. This was the time and era when many students from

Initially I had chosen to use three schools for my research. All the schools are based in Soweto. The schools cannot be explicitly identified due to confidentiality reasons. However, due to one school pulling out, I was left with two schools to do my research at: a primary school and a secondary school. The schools were

chosen because of already existing connections; their proximity to each other—they are based in the same street; and they all have a food garden. It was also economically sound for me to choose schools that are next to each other to save time as well as money.

When I was searching for schools with food gardens in Soweto, I came across a school that I once visited when the organisation I am part and parcel of called Faculty of Best Advisory-FBA (www.facultyofbestadvisory.org.za) was invited to assist with career guidance and motivation for matric learners in 2015. When I was at the school, I realised that there are three schools around the area excluding the school I knew. I arranged to meet principals of the other three schools. I only managed to get meetings with two principals of the two primary schools; the other principal always said they were busy, and we never managed to meet. Of the remaining two schools, one principal agreed for me to do the research at their school and the other one declined. I was left with two schools: the primary school that agreed to allow me to do research and the secondary school I had a prior connection with. Each case site is described in detail in section 4.2.

Negotiating Access and Sampling

Even before selecting cases, I needed to get institutional permission from the Gauteng Department of Education (GDE). They granted me permission to do research in the schools until the 30th of September 2017 (see appendices).

In terms of school access and sampling, I made appointments to have meetings with principals in four schools with food gardens in the same area. Of the two schools that agreed to participate, I relied first on principals' referrals to meet staff and then a snowball sampling strategy. Snowballing is an example of non-probability sampling (Neuman, 1997). Snowball sampling is used for selecting people who are directly or indirectly connected to each other. This technique starts with one or a few cases and spreads out as a result of the initial case. The first case for me was meeting with the principals who introduced me to one or two teachers. They then referred me to other teachers because at the end of each

interview, I requested them to connect me with teachers who could be interviewed for my research (c.f. Neuman, 1997).

At the primary school, the principal referred me to a teacher that is responsible for the garden and nutrition in the school. After I explained everything to the teacher and had an interview with her, she was then able to introduce me to other teachers who took part in the interviews. I was able to interview five teachers at the primary school. They were all female and over 30 years old, with relatively long teaching experience.

At the secondary school, the principal also referred me to a young teacher who had been in the school for two years to introduce me to the other teachers in the school. She also assisted with arrangements of interviews with other teachers. I interviewed 14 teachers at the secondary school. They were a diverse group: five were older teachers (above the age of 30 years), three men and two women. Out of the nine younger teachers (below the age of 30 years), three were young women and six were young men. There were also senior teachers who had been at the school for over 5 years and used to be part of the garden committee. There were four of them; however, only one was comfortable and agreed to participate in the interview and the other three said that they are busy and would not be able to make time. This meant that the most “data rich” teachers did not participate in the interviews. Their previous experiences of being involved with the garden and its past challenges are unfortunately not reported here. At the primary school, the teachers did not complain a lot about time during interviews; however, they said that they can only participate if the interview was short. In their majority, they were rushing home after school for other commitments, so they wanted to be interviewed during free periods as well as during lunch time.

3.4 Data Collection

Semi-structured interviews

Semi-structured interviews involve an exchange between an interviewer and interviewee, structured around a short set of more open questions (Longhurst, 2010). This form of interview happens in a conversational manner allowing participants a chance to explore pertinent issues (Longhurst, 2010). Prior to the interviews I read the participant information sheet to the participants and gave some time to read the consent form and sign (see appendices for templates). I also introduced myself and the purpose of my research to all teachers I interviewed. The specific interview questions can be found in the appendices. I conducted the interviews in English.

With the permission of interviewees, I recorded the interviews using my cell phone and took notes also. I could not properly record three interviews: they were recorded but I was not able to hear, the volume during the interview sessions was too low. I had to rely on the notes and to also try to remember.

At the primary school, I had interviews with the teachers in their respective classrooms and at the secondary school I had interviews with the teachers during lunch time, after school and during their free periods. Interview time was approximately between 20 minutes and 35 minutes. The teachers always wanted to finish, in particular at the secondary school, so I had to be strategic and ask the key questions and not have many follow up questions.

I went to the schools at least three times a week during the permitted period. I was using public transport to travel to and from Soweto, from the University of the Witwatersrand, Johannesburg.

Participant Observation

Another method for data collection which was used is participant observation. Participant observation includes but is not limited to living, spending time as well

as working with people or communities with deliberate intentions to get to know them as well as to understand them (Laurier, 2010). With this method I spent time at the schools so that the participants (teachers) could know me and they can also develop some trust. This allowed me to observe what the participants do, and it was important as it helped me make informed decisions not based only from what the participants responded with during the interviews (Slater, 2010). I was able to spend time with the teacher and learners at the garden of the primary school once when the teacher took them to the garden to teach them. There is also an old man who works as the school gardener and for maintenance. He was the one doing all the work in the garden, demonstrating while the teacher was asking the learners questions and informing them what the gardener is doing in the garden.

Before the teacher took the learners to the garden, I also had the opportunity to observe and learn about the garden from the person who takes care of it. The gardener informed me about the garden and showed me what work needs to be done and where is going to be done.

At the secondary school, the teachers were not using the garden for teaching and learning, and the garden, although it was in the school premises, was now used by community members and they were in ownership. I could not spend time in the garden as it is no longer part of the school in practice. However, I made sure that I had conversations with teachers before and after the interviews.

I took pictures but I could not put them in the thesis for confidentiality purposes as I did not want the schools to be identified as per the ethics agreement I signed. I also unfortunately lost some of the pictures which were in my phone.

3.5 Data Analysis and Interpretation

Data analysis is a way of creating order, structure and meaning around a lot of acquired information. It is a complex demanding task that is not straight forward (Marshall and Rossman, 1995). Qualitative data analysis is about looking for emerging and developing themes across collected data (Marshall and Rossman,

1995). With regards to how I got the information, I saved the interview recordings in my computer. I retrieved the recordings from my computer and transcribed them word by word. I listened to the interviews multiple times to ensure that the transcriptions were well captured. I also made a summary of each interview, and combined it together with the notes I was taking during the interviews and participant observation session to get a sense of who the participants were.

I started to create themes and sub-themes. I copied quotes from the original transcripts to new documents organised by different themes and categories. Following this process, I then organised the themes according to the purpose and objectives of the research. After separating the themes according to the objectives and purpose of the research, I started to create links between the themes and draft the results. The data acquired in this instance was words and ideas.

This way of analysing enables the researcher to compare data across many texts. Firstly, coding allows the researcher to identify patterns. I started by reading through all the transcripts. In the process of reading, I was looking for themes that are emerging as well as subthemes and also looking for themes I identified as per the objectives and questions of the research (Neuman, 1997). Following that, I went back to my literature review and started to connect with the relevant themes. Thirdly, I started aligning the themes in order to make sense of the data.

Validation

I combined the interviews and notes from participants' observation to validate the response from participants. I also listened to the interviews multiple times during the transcription process.

3.6 Ethical Considerations

Before going to the schools, I applied for an ethics certificate from the ethics committee of the University of the Witwatersrand, Johannesburg. I also applied for permission to do research from the Gauteng Department of Education (GDE)

which granted me permission to carry out research until the 30th of September 2017. I only started with the interviews and participant observation after I received letters from both the ethics committee and GDE (see appendices).

Prior to getting the letter from ethics, I had to ask permission from each of the principals to indicate that they will allow me to do research at their schools. I requested to interview adult educators in the schools, who could freely give their consent. Children under 18 constitute a vulnerable population. In the schools, I informed the participants they will not be getting any financial gains from participating in the research. I also read and explained the consent form to the participants before interviewing them. As per the ethics instructions, I will not be revealing the names of the participants as well as the names of the schools I did my research at for anonymity and confidentiality purposes. Nor are there any photographs of school premises for these reasons.

In line with GDE requirements, I am going to send them my thesis, and report back to the schools. I will prepare separate suggestions and recommendations for each school that participated in my research on how the school garden can be bettered. I will avail myself for consultation via phone call to answer further questions that the schools might have so that I continue to add value to the schools beyond the research completion.

3.7 Timeline

I submitted my proposal to the Wits Faculty of Science at the end of June 2017. I received ethical clearance subsequently, and started data collection in the next school term, from the middle of August 2017 and had until September 30th to complete within GDE requirements.

3.8 Methodological challenges

I encountered challenges when gathering data in the field and prior to data collection. With only a year to complete my Masters, at first I had planned to

spend three months in the field. But due to delays and various institutional research clearances, the time was shortened from three months to a month and a half.

GDE granted me permission to do research in the schools chosen until the 30th of September as per the department's policy which does not allow research to be conducted in the last block of school due to exams or during the school holidays. Then followed the back-and-forth process of getting ethics clearance from the Wits Ethics Committee, and I could only begin with the data collection after receiving the ethics certificate.

Within these constraints, I dedicated the weeks I had to interviews as well as participant observation. During the interviews, the teachers wanted the interview to be short, and did not allow for follow up questions. I had to strategically frame questions so that I could get more out of these responses, and also combine questions so as to not appear to be asking a lot of questions.

Some of the teachers at the secondary school were a bit reluctant to participate in the interviews; I had to have casual conversations with them to develop trust and relations with them. I also had to assist learners with applications and advice about post-matric opportunities until some of the teachers agreed to participate in the research. Again as a result of the limited time, when I had interviews, I scheduled them when possible for the same day in both schools since they are situated in the same areas. This allowed me to go to the field and spend the whole day doing interviews. It saved me travel time and travel costs.

3.9 Conclusion

The above section was about how the study was conducted. In what follows, I focus on discussing the results or findings of the study in relation to policy, the scholarly literature, as well as in relation to the theoretical coordinates of this research.

Chapter 4: Results

4.1 Introduction

This chapter presents results from thematic analysis of both my interview data and my observations. Drawing primarily on my observations, I will first situate and introduce the two schools, starting with the primary school and followed with the secondary school. In addition to contextualising the schools, I give an overview of the food gardens' current status. I then present more specific results from thematic analysis of my interviews. I first analyse the existing practices at both schools, and immediately after I focus on challenges, and the last section will be about future possibilities or imaginaries shared by teachers vis-à-vis garden-based learning. I will be drawing similarities and differences in both schools together as I report the results. As mentioned in the methods chapter, I will not refer to either school or their staff by name. Rather I use 'PS' to indicate the voice of a primary school teacher, and 'SS' to indicate a secondary school teacher.

4.2 Situating the schools and their gardens

The primary and secondary school are situated in one street of the same township in Soweto, less than a kilometer apart. Outside the schools and around the area there are panel beaters, hair salons, spaza shops, taverns, and street vendors. There is a lot of taxi movement in the area. The area comprises of old council houses which are home to the working class. The houses were provided by the apartheid government. They have a toilet, kitchen and running water. Most of these four-roomed houses are concentrated with shacks (small houses made of corrugated iron sheets) even though they have small compounds. Nearby the middle class reside in slightly bigger houses with larger compounds and their yards do not have shacks. The middle class and working class areas are separated by the street on which the schools are found.

The working class I am referring to in this instance are residents who are working for low wages in manual labour or factories in the neighboring suburbs of Soweto

and city of Johannesburg. The middle class in this case refers to professionals which include but are not limited to doctors, nurses, teachers, engineers, lawyers and business people who do professional work and have acquired higher education qualifications. The schools' pupils in their majority are from working-class families because middle-class parents take their learners to private schools or transport them to 'Model C' schools in other parts of Johannesburg as they can afford to pay the fees and/or travel costs.

The area is home to only black African people, because the area was designated for black African people during the apartheid period. The area was designated for Bapedi, Vendas, and Tsongas as well as Zimbabwe, Lesotho and Malawian internationals. In the 1940s, the primary school in particular was for Zulus and Sothos and the high school was for Zulu, Sotho, Pedi and Tsonga-speaking pupils as well as international learners.

The Primary School

The primary school has three blocks: the first block from the gate is newly built and is not double storey; the other two are old blocks and are double storey buildings. The school has a very small yard. It does not have sports facilities. The school has 785 learners registered in 2017, who range from 5 years to 13 years, and 19 registered teachers. The primary school mostly has older teachers; and almost all teachers are above 30 years.

The primary school has a garden that is very visible and accessible to everyone including visitors. It is in front next to the gate of the school, and it catches the eye of everyone coming to the school. The garden stretches from the gate to the corner of the yard. The garden at the primary school is approximately 6 square meters. The crops in the garden include Chinese spinach, spring onion, cabbage and carrots. These are the crops which were planted at the time the research was conducted. The old man working in the garden who was preparing the soil for new seedlings to be planted mentioned that the crops are alternated according to seasons. I had an informal conversation with this man who is in charge of

maintenance in the school, and also takes care of the school food garden. He took me for a tour around the school and the garden.

The old man spoke at length about the challenges that they are facing with the garden. As we were having an informal conversation, he kept on mentioning that I should tell people at Wits to assist. However, I made it clear that I am actually conducting research and I will be interviewing the teachers attempting to come up with solutions after the interviews. The old man works with one teacher who is in charge of nutrition in the school.

The garden was being reworked since it was disturbed by weather conditions during the winter. The other challenge was that the soil in the garden was affected by the renovations of the school which happened in 2016. The garden cannot be moved elsewhere because there is no longer space available in the school. The garden was in the school prior to the renovations in 2016; during the renovations, it was affected and it had to be re-established. The history of the garden prior the renovations was not followed through due to time constraints. When the school's infrastructure was being renovated and expanded, the garden area was used to dump the waste during the construction and the soil quality was affected. The garden is also situated next to where water is flowing and is affected during heavy rains. Rats too are eating the crops planted in the garden.

Despite the disruptions, the garden is being used to produce food to supplement the school feeding scheme and also providing food for learners from underprivileged backgrounds. The majority of learners come from informal settlements that are not far from the schools, and their parents are not working. Most of the learners attending the school come from poor families, families whereby both parents are either unemployed or one is unemployed and if they are employed they do not earn enough money to afford fees for the children's education. In addition, the teachers are aware of which learners come from households where there is no income and mostly children from these households

are the ones that take vegetables home when there is surplus. Teacher 1 from the primary school stated,

“There are some learners in our school who come from very poor backgrounds. The garden helps provide with food of proper nutrition, so that they can eat a healthy meal” (interview with PS1).

The garden at the primary school is also used for teaching and learning, and the teachers are involved together with the School Governing Body (SGB). One teacher confirmed that,

“Yes, the garden is being used for teaching and learning, because when the old man plants that side, I usually take learners to go and see how to plant, and also to make a compost” (interview with PS2).

The learners, although they are not heavily involved in the garden, are always encouraged to contribute to the creation of compost, by throwing in peels of bananas and other fruits.

After spending time at the school I observed only once when learners were taken to the food garden. Here the teacher was educating the learners about the gardening process, and the learners were engaging but not getting physically involved with their hands. The teacher explained that they do not allow the learners to plant and participate physically because they do not want them to make their school uniform dirty since they struggle with washing powder and water access as result of their families’ material conditions. This emphasizes that the school is in a poor area.

The Secondary School

The secondary school is also based in the same township and on the same street as the primary school. The school has about 1400 learners, ranging from 13 years to 20 years. There are 22 teachers at the secondary school, with a mixture of younger and older teachers (young in this case being those below 30 years old or having less than five years of teaching after completing their qualifications, and older being those above 30 years with more teaching experience).

The infrastructure of the secondary school is relatively bigger than that of the primary school. The school has a block of offices for the teachers and principal as well as the school reception. There are also two double storey blocks for the classrooms, and a big yard with a soccer field and an area where the garden is situated at the back of the school's classrooms next to the field. The garden is relatively bigger compared to the primary school one, at about 10 square meters. The school netball ground is between the classrooms and the office block.

Although the garden is in the school premises, it is now largely used by community members who are not part of the SGB or staff. The garden used to be part of the school when the teachers, SGB and sponsors were involved. There was even a garden committee at that time. However, after the sponsors stopped in the past two years, and there was a change in SGB, the garden was abandoned, until community members came back and rejuvenated it. The full history appeared to be sensitive, and was difficult to uncover.

In the present context, the garden is not used for teaching and learning. As one teacher from the secondary school explained, they had been in the school for almost five years but had never seen any teacher use the garden for teaching except once in a while when learners have been punished to clean the garden and irrigate (interview with SS12, not verbatim). It is used for producing food for the learners and community members as well as a punishment tool when learners are late and they did not do their homework's or assignments or perhaps when they have failed. In terms of the former, a teacher who had been at the secondary school for more than 10 years stated:

"We provide learners that are coming from disadvantaged communities with vegetables, in particular on Fridays" (interview with SS2).

4.3 School Garden Practices (By school and across schools)

This part of the results chapter focuses on the first research objective which was to investigate what the food garden is actually being used for in both schools. The results show that in both schools the garden is being used to supplement the

school feeding scheme. In the primary school, it is used to some degree for teaching and learning and recycling, however at the secondary school is not used for teaching and learning. The uses of the garden will be reported below respectively.

Feeding scheme and Poverty Alleviation

Teachers in their majority at both schools reported that the basic purpose of the garden is to provide food for the learners and the community where the schools are based respectively; this was the dominant view from both schools. The garden benefits the school in the following ways; first the garden provides vegetables to be cooked and eaten during lunch as part of the school feeding scheme. Secondly, the garden provides fresh vegetables that are taken home by the learners and the people who work at the garden and some teachers. A teacher from the primary school stated:

“There is a food garden in our school; the garden is used for feeding scheme, when the food has grown and is matured to be eaten” (interview with PS3).

This is in line with most schools in the areas, according to one teacher at the secondary school:

“most schools including my former high school where I learned use food gardens for producing food for the learners and the community members” (interview with SS14).

Another teacher from the primary school mentioned a few challenges they have with the garden despite getting food from it:

“We used to get vegetables from the garden and supplement the feeding scheme, we will also take some home, but now I am discouraged because rodents eat some of the things, we can be sick because these days you do not know which disease is there” (interview with PS6).

Feeding schemes are particularly important where the learners come from poor backgrounds. As one primary school teacher put it,

“The garden is being used for learners who come from informal settlements, who come to school not being fed” (interview with PS2).

This is due to the fact that the school food gardens being researched are located in an area that is historically disadvantaged and majority of the people in the area are unemployed hence the school is a non-paying fee school. Some learners in the township schools stay in child-headed household or with single parents that are mostly unemployed or earn below minimum wage.

The high school presented a more dynamic case, the garden being a project of the community members and the SGB not being involved like at the primary school. The beneficiaries of the garden's produce were multiple and changing. However, the garden has and is still being used to meet wider food needs as the people sometimes donate to the school feeding scheme. One teacher who had been in the school for a long time – for two years, then a brief break, and a return after a year to complete another six years – saw the garden as used for feeding both the learners and the community (interview with SS13, not verbatim). Their view was complicated by other teachers from the same school, one who knew little about the garden:

“I am not aware of the school food garden and if it is being used for any purpose, but from my past experience with school food gardens I know they benefit the people who work in the garden as well as the school feeding scheme with extra fresh vegetables” (interview with SS8).

And another who noted a decline in vegetable production:

“The garden as far as I know is for supplementing food for the feeding scheme, during the time of harvest, some of the vegetables will come from the school food garden, but now we do not receive vegetables anymore and I am curious to find out why” (interview with SS7).

Teaching and Learning

The teaching and learning aspect of the food garden is only at the primary school as reported by some teachers and observed by the researcher. In contrast, at the secondary school the garden is not used for teaching and learning as reported by the teachers also and observed by the researcher.

At the primary school, use of the garden for teaching and learning was reported as both direct and indirect. Teacher 2 from the primary school mentioned that the

garden is part of their school curriculum in the second term of teaching and learning,

“in second term, we teach different types of soils. It is part of the school curriculum. Which soil is good for planting ...and then during the course of the year, we do recycling, (by doing compost). When peels and seeds are being dumped, they could see seeds are coming out” (interview with PS2).

Others used the garden more indirectly for teaching and learning about recycling (see section below).

However, within the primary school, the garden's direct and indirect use vis-à-vis teaching and learning is uneven across age, stage and teacher. One primary teacher explained that,

“I know of one or two teachers that use the garden, they normally take learners to the garden once in a while. I do not take my learners because they are still very young in my view to understand other things since they are still learning to read and write. But the important thing is that I tell them that the food they eat is sometimes from the garden” (interview with PS5).

This was a teacher who is teaching Grade 1.

In contrast, at the secondary school the teachers are not using the garden for teaching and learning, but they use it differently, as mentioned earlier by Teacher 12 who had only seen it used for punishing learners in the five years they had been at the school (interview with SS12, not verbatim).

Recycling

At the primary school where the garden is being used for teaching and learning to some degree, the garden is also being used to encourage recycling. One teacher who is using the garden said that the garden is part of the curriculum, as mentioned during the practices section above. Moreover, another teacher from the same school supported the other teacher,

“I am a teacher in the school, I have been teaching Grade 5 and 6 from 2010, I usually throw peels of bananas and encourage my learners to do the same on the other side of the garden...one of our teachers has told us about the compost that they are doing and also as part of the recycling process. I like what they are doing but I am not involved because there is a teacher

who is taking care of the feeding scheme and nutrition” (interview with PS6).

The teachers are participating in the recycling with their learners. Indeed the peels were observed as well as the compost on the side of the garden where crops are not planted.

Punishment

If learners are not doing school work or are failing, they are sent by some teachers to the garden to work as a method of punishment. This is popular at the secondary school but was also mentioned at least once at the primary school. A teacher from the primary school responded that:

“Some other teachers make learners water the plant as a punishment. I do not normally see other teachers doing it as I am in class most of the time” (interview with PS2).

She continued to mention that this is done particularly for higher grade learners, the Grade 6 and 7 learners.

Another teacher from the secondary school mentioned the role of the garden as a punishment tool although they had mixed views about it,

“Teachers must take learners in the garden after school or send them to the garden if they do not do homework and they are late to punish them, but that can also increase the culture of late coming and not doing school work, it must be done in a way that is encouraging and inspiring” (interview with SS10).

Another teacher from the secondary school also shared her perspective about the use of the school garden as a punishment tool,

“Normally teachers will take learners to the food garden as a punishment and not for learning, and this make learner to have a bad attitude around gardening or agriculture as a whole. The learners must be taken to the garden for garden[ing]” (interview with SS14).

There was acknowledgement of the limitations to using the food gardens as a punishment tool, and its wider ramifications on student perceptions:

“Myself I read, I think most learners think food gardens are for people who are failures in life, people who did not go to university...they do not know

that sometimes people go to university and sit at home with their degrees”
(interview with SS7).

4.4 School Garden Challenges

This part of the results focuses on the challenges affecting food gardens at the two schools, their similarities and differences. Initially the research did not have an objective or goal to focus on challenges within the garden as well as challenges in using the garden as a tool for academic instruction. However, as the interviews were conducted, the theme of challenges started to emerge many times from the participants. Some challenges were also observable to the researcher.

Both schools face challenges in using the garden for teaching and learning as well as for the feeding scheme. However, while they share the same challenges in terms of resources, there are also challenges specific to each school. The secondary school’s challenges are more to do with human resource challenges, such as leadership. The primary school challenges are related to environmental and climatic conditions, as well as availability of land. The sections below will cover challenges with regards to leadership, resources, environmental and climatic conditions and old mind-sets.

I will start with firstly with leadership followed by environmental and climatic conditions, then resources, and finally old mindsets. This section will deal with challenges at each different school respectively which will be followed by shared challenges at both schools.

Leadership

The challenge with regards to leadership was only reported by teachers at the secondary school where the garden is now in the hands of community members, despite it being in the school premises. There was no case whereby the teachers of the primary school mentioned challenges pertaining leadership. By leadership in this context I am referring to the principals, teachers and SGB.

Two teachers mentioned that a challenge is the alternating leadership in their school that is not consistent, because with new leadership, the goal and the mission changes. I quote from one extensively:

“I think there should be permanent people who are appointed for the responsibility. Another thing that makes this thing not to be successful is the change of leadership” (interview with SS4).

They continued to say that,

“one time you find that the leadership, maybe the principal has no clue as to what is the aim of the project. When another teacher comes he forgets that project. There is no continuation or succession. Even governing bodies also, sometimes governing bodies might be knowledgeable about these projects, but when they change after two or three years, you find that new members are now not clued up, as to how to continue with the project” (interview with SS4).

This also becomes a problem even when the SGB changes,

“and the people themselves who are benefitting like the community, as I said that it was the community do not have a lot of interest. The school garden, I think the management should show its importance, and once it can be implemented, it will be difficult for it to fail, once the school sees its significance and it will sustain itself” (interview with SS4).

It appeared, although difficult to confirm, that the garden may have been a source of contestation in the past and that teachers at the secondary school and the current garden users do not see eye to eye.

Environmental and Climatic Conditions

The challenges affecting the use of the garden for teaching and learning are not only limited to leadership; there are also environmental and climatic challenges. The teachers at the primary school noted that heavy rains cause problems in the garden by washing away the crops and burying the crops with soil. This also affects learners' ability to be in the garden:

“we have our own challenges; if it rains heavily the vegetables become damaged. The challenge with teaching in the garden is that the learners become very dirty with their school uniform” (interview with PS1).

They went further to explain that also the material conditions limit the learners' participation in garden activities (see the following section).

The challenge of climatic conditions were linked to infrastructure when one teacher of the primary school said that,

“I can say mostly school food gardens do not have greenhouses. Plants become disturbed because of extreme weather conditions. The other problem is how the garden is structured and the amount of solar energy it receives” (interview with PS3).

-the garden being situated under big trees which reduce the amount of sunlight received by the planted crops.

Primary school teachers also mentioned that rodents are a potential health threat to the garden and the school’s feeding scheme. A teacher described how they were anxious about the possible effects:

“We used to get vegetables from the garden and supplement the feeding scheme, we will also take some home, but now I am discouraged because rodents eat some of the things, we can be sick because these days you do not know which disease is there” (interview with PS6).

Environmental and climatic conditions are linked also to lack of resources.

Resources

Resource challenges affect both the primary and the secondary school. The resources in question include land and space, water, sponsorship, time and uniforms as well as washing powder for learners. The resource challenges can be separated into school resource challenges and household resource challenges. I will start with school resource challenges and end with household resource challenges.

School resource challenges are resources associated with the school and in the school premises, such as water, time, space, and sponsorship. On water, one teacher explained,

“I think the challenge is the availability of water, sometimes water is shut down and we are forced to let learners go home. This means the garden is affected too by lack of water” (interview with SS6).

One teacher from the secondary school highlighted that there is overcrowding in the school and subsequently the learners failed in their majority, saying that,

"I regret not using the garden because the learners are failing; our Grade 9 class which has about 5 classes, and all of them have failed mathematics due to overcrowding. It means there is something we are getting wrong, I think if we can start taking the learners to the garden, others will unlock their passion and future careers." (interview with SS7).

Another resource challenge expressed by the teachers at the secondary school was the issue of sponsorship. The garden project was initially sponsored at the secondary school until the sponsors pulled out. The withdrawal of sponsorship affected the garden as well as other challenges such as teachers' commitment and time constraints, as will be discussed in the next section.

Household resource challenges were also noted by two teachers from the primary school. The material conditions of learners are a limiting factor for learners being taught and also learning using the garden as one teacher explained:

"the challenge is that learners do not do it themselves, they just look. But we give them seeds to plant at home, sometimes. Not always. The learners are always excited about going to the garden; however, the challenge is that they live in informal settlements. There are shacks. There is no enough space. It is unlike in rural areas where a child can just find land and say 'I am making a vegetable garden'" (interview with PS2).

Due to the space the learners find themselves, it is not easy for them to start implementing all that they are learning, as a result of the aforementioned challenges.

Another problem with regards to using the garden as observed by a teacher at the primary school was that,

"the garden can be used for teaching but the learners—in particular my own—are still very young, and also some have only one pair of uniform. If you take them to the garden, they will come back very dirty. Some stay at informal settlements, they do not have enough water to wash every day and also Sunlight is expensive" (interview with PS5).

Old approaches to teaching and learning, and gardening as old-fashioned

Old approaches to teaching and learning were mentioned as another challenge, particularly by the newer teachers I interviewed. As one teacher explained, school

systems have not changed; they still maintain the old industrial mindset or philosophy. Schools are more like prisons, in which everything is old and there are no new things being introduced. In their perspective, the school should cater for garden learning, encourage it and encourage all learners to participate in the project (interview with SS13, not verbatim).

Another secondary school teacher observed that there is lack of knowledge and information about gardening,

“I think it’s because there is lack of motivation and guidance, you know some of the learners, they tend to think when we talk about gardening is something that is supposed to be done by old people, and they are not aware that they can make something out of the garden. Maybe I think it’s the lack of knowledge to our learners” (interview with SS5).

The old approaches to teaching and learning as well as structural issues of class size, funding, time and curriculum among other challenges can only be solved by systemic changes and building alternative forms of learning and teaching – as the teachers shared with me in the following section.

4.5 Future Imaginaries about School Food Gardens

Despite the challenges and limited engagements with using gardens for teaching and learning in practice at these two schools, my interviewees shared many future imaginaries of how food gardens can be used to achieve the goal of using it as a tool for academic instruction. For example, one teacher from the secondary school was already thinking far ahead:

“these days technology is important. I read about farming and technology, about aquaponics, the type of farming you can do wearing a suit ... now that is the future ... you can have that in your home and you will never have to buy vegetables and fish” (interview with SS7).

For him, when the learners are taught in and about the garden, they would be taught what is happening in the world so that they can catch up and understand processes. For another teacher, garden-based-learning offered an alternative model for education altogether:

“I think it will be a good idea to take learners to the garden. It exposes them to [the] natural environment, which is also important, and also to remove the CPF method—Cram Pass Forget Method—whereby people just study to pass a test or exam and forget. In the garden the learners will learn with a purpose, to say, if I am learning about growing vegetables, how to count the tomatoes and the costs, this I can also do when I have my own farm or vegetables market. It is not just for the sake of doing school work or assignment, is what I can do to prepare myself for a better future” (interview with SS3).

These teachers were not alone. 9 out of the 14 teachers from the secondary school had future ideas and were thinking of what could be done in future. Again, this was mostly the younger or early career teachers. 3 teachers from the primary school also mentioned their future perspectives. This section will focus on these future imaginaries, which range from curriculum development, to knowledge production, health and nutrition, sustainability, skills development, independence, and responsible citizenship. This section also addresses the second and third objectives of the research about the skills that can be acquired in the garden as well as how garden-based learning can be integrated in the future school curriculum for learners.

Curriculum Development

As discussed in the practices section, we learnt that the garden was part of the primary school curriculum for teaching learners about recycling and making compost. At the secondary school, however, the garden is not part of their curriculum. Yet, most of the teachers interviewed shared their views on how it can be incorporated into everything from Geography to Biology and Life Sciences and Consumer Studies.

“For example, if there are teachers who teach life sciences, because sometimes they teach about ecosystems, then they can plant the type of ecosystems that they want. Sometimes plants are used for example to check presence of chlorophyll. They can plant the type of plant they want, for instance sometimes I had one teacher saying geranium plant is needed, and there was no geranium” (interview with SS4).

Another teacher seemed disappointed that there is no longer agriculture offered as part of the curriculum and expressed their views as such:

"I think previously we used to have agriculture, but agriculture was phased out. I think at the moment, it can be used for subjects like consumer studies because they are dealing with things like cooking, it can be suitable if it's linked to teachers and learners who are doing consumer studies" (interview with SS5).

Another older teacher from the secondary school concurred, asking that agriculture be brought back to achieve the goal of garden-based learning. He said that,

"If you can introduce a subject that is most relevant to gardening here in Soweto since we do not have those subjects, it will be a good idea. We concentrate on subjects that we believe will help learners become engineers and doctors. We need people who will concentrate on agriculture" (interview with SS2).

The other teachers at the secondary school were not worried that agriculture as a subject is not there anymore, but shared a perspective on how the garden can be used in other subjects:

"the garden can be used for Life Sciences, they also talk about plants, I believe that most of the things that they do in Life Sciences, they can see them and they will be visible, instead of just knowing the things part, like how the plants grow and what it takes for the plants to grow, I believe that the garden can be valuable for life science teaching" (interview with SS5).

Another teacher spoke about how the garden can be used in the subject of Geography,

"We can use gardening in Geography when we are focusing on the types of slopes, vegetation and type of soils that are favored by the current soil that we are planting in the food garden" (interview with SS6).

One teacher from the secondary school who was on teaching experience was willing to take it upon themselves to bring change to the system. They said,

"I think there should come a point where we do it ourselves as teachers, whereby we take initiative and take matters in our own hands to inspire confidence in the lives of young people, if for example we say the curriculum must change to incorporate food gardens, what about the schools where they cannot plant, it then becomes a problem ... maybe we can have a curriculum for gardening that is for schools that have food gardens and those schools which will love to have food gardens, not to change everything" (interview with SS7).

Knowledge production by teachers and learners

Connected to its curricular possibilities, teachers mentioned the opportunity for building different kinds of knowledge through the garden. They mentioned biological knowledge, environmental knowledge, sustainability, health and nutrition. I will start with biological knowledge which has to do more with biological systems and process in the garden. I will then move to environmental knowledge which is about understanding the functions and purpose of the environment, then ultimately I will focus on sustainability as well as health and nutrition.

Biological and agricultural knowledge

Teachers from both schools shared the view that the garden exposes learners to biological and agricultural knowledge. By virtue of learners going to the garden, they will have a better understanding of biological processes as they observe or participate and initiate some of the process. A teacher who took learners to the garden at the primary school said,

“In future, when the learners are exposed to garden learning, they can be able to eventually grow their own crops. They will know in which season to grow which crops. Some do not know that other plants are seasonal” (interview with PS1).

The same view was articulated by a teacher from the secondary school who said that,

“So, I think if the learners learn to plant, and all the processes, they will eventually master it to a point where they can do it by themselves, and when the teacher tells them, they will even be motivated” (interview with SS7).

Furthermore, when they are in the garden, there is specific language that is being used, that can only be spoken in the garden. In addition to general biological knowledge, learners can also learn about specific terms associated with the garden:

“They could learn a lot of things in the garden. They can learn the language that is being used in the garden for example, cultivation, planting, watering, irrigation; they can easily understand the terminology in the garden” (interview with SS4).

Teacher four from the primary school added that,

“They can learn which crops can be sown in which season. As they visit the garden and see which crops are sown and harvested in which season they will eventually know more about crops and seasons. This will also make learners start talking about vegetables and make them choose a healthy lifestyle” (interview with PS4).

We will return to the issue of health shortly.

Sustainability

Although the garden is used at the primary school for teaching about recycling and compost making, building knowledge about sustainability through the garden was only mentioned once by one of the young teachers who was doing teaching experience at the secondary school. He said that,

“One topic which I have in Tourism is sustainability. Sustainability is about going green and not harming the environment. When I talk about going green and they see it, it should be easy for them to relate to my message” (interview with SS1).

He emphasised that when learners are taught about something they can relate to and see, they can easily understand the topic.

Health and Nutrition

As mentioned earlier, a teacher from the primary school highlighted that teaching learners in the garden will raise their health awareness and eventually “make them choose a healthy lifestyle” (interview with PS4). Another teacher from the primary school made an assertion that the garden can also be a platform for keeping the learners busy and exercising as she diagnosed that,

“the problem here is that kids do not work, that is why they are obese and sick all the time. It is because they do not keep themselves busy, they just eat and watch TV. They become lazy people” (interview with PS5).

The teachers at the secondary school saw the vegetables from their garden as particularly healthy,

“because at least those vegetables were healthy than the ones we get from the department, because these ones did not travel and they are not genetically modified. We know where they were grown and they were grown by our people” (interview with SS7).

Another teacher from the secondary school emphasized that,

“there is a need for people to consume healthy food since people have diabetes and high blood pressure, hence they must learn to eat healthy food” (interview with SS8).

Nutritional education was only mentioned once in passing by a teacher from the secondary school in relation to health and environment:

“I think if we can teach about taking care of the environment. For instance, if you talk about different vegetables that are grown in the garden, the learners will be able to see them and it will also be easy for nutrition education” (interview with SS2).

Alternative pedagogies: practical/experiential learning, assessment and skills development

Teachers from both schools were of the same view that gardens offer practical learning opportunities and different assessment possibilities. A number of teachers explained how garden education can be used to balance theory education that is offered in the classroom. Teaching learners in both the classroom and in the garden will give them an experience of two worlds:

“aside from learning theory, the learners will see what they are taught and do it practically, they will also be able to interpret what is happening and the routine of plants” (interview with SS6).

“The classroom is about the imagination, in the classroom we imagine things, and we do not see them. In the garden you can see things and touch them. In a way, both classroom and practical learning are needed to balance each other” (interview with PS3).

“The garden offers an opportunity for practical learning. You find that there are learners that are not coping, when it comes to academic things. But if you take them outside, you find that they are excelling. The learners may then pursue a different career altogether and make a living out of it, rather than concentrating on academic issues even if they are not going to make it” (interview with SS2).

One teacher from the secondary school regretted not using the garden for teaching and learning because the learners were not performing well in the classroom. They thought that garden based learning will improve the performance of the learners. Another secondary teacher continued to challenge the system and said that,

“Classroom education is limiting those who are good with outdoor learning. It will be easy for me to assess my learners based on something, if I teach them using the garden. I will be able to explain topics of global warming, that plants are important, we should plant and not cut and burn” (interview with SS1).

Alternative assessment

This teacher introduced the notion of garden-based assessment (interview with SS1). Assessments in schools are usually predetermined, assessing standards on whether learners can read, write, draw or calculate, and that determines the success of learners at school. A few primary school teachers felt garden-based learning offered other assessment possibilities:

“Garden-based learning gives teachers an opportunity for an alternative assessment. Since some learners are not good in theory, they can be assessed on practical work. Some learners are good with working with their hands” (interview with PS1).

“if the garden becomes used for assessment purposes, it will be a great idea” (interview with PS3).

The few primary teachers see the garden being used not only for teaching, but also for assessment purposes. This would give an opportunity for learners who are good with practical work to get good marks and increase their confidence because of the marks attained. However, the assessments can only be accommodated if garden-based learning becomes part of the schools’ core curriculum.

Skills development

Two teachers from the secondary school acknowledged that gardening skills are not transferable only through theoretical knowledge. Rather, the learners can learn about gardening by actually doing it and being hands-on in the garden; that is how they will learn valuable and diverse skills.

“In the garden people learn valuable practical skills which unfortunately cannot be taught in the classroom like entrepreneurship. You must learn by doing. You can know all the theory but if you do not do anything, you will never understand” (interview with SS11).

“The garden teaches those skills of how to plant vegetables, very necessary skills that they cannot learn in the classroom” (interview with SS8).

A teacher from the primary school cemented that skills are significant and mentioned a few skills that are attainable by taking part in the garden, far beyond direct gardening skills:

“Observation skills are enhanced in the garden, and again, critical thinking, in a way, what you learned in classroom is being applied in real things. And then when you observe whatever you will be observing you know that you are dealing with real things” (interview with PS3).

The above was to emphasise that certain skills like the aforementioned would be honed in an experiential, practical environment and the garden offers that platform. In addition, new technologies such as aquaponics do not require many people to work in conventional gardens, and they do not require much land, and also save a lot of water. Moving away from traditional gardening to aquaponics will solve some of the challenges that are confronting conventional gardening methods or approaches.

Decolonised Education

Out of the 14 teachers interviewed at the secondary school, it was only one young teacher who mentioned that there is a need to decolonise education in relation to possibilities of garden-based learning. Interestingly, they were the same teacher interested in the entrepreneurial possibilities of garden-based learning (see below). About decolonized education, they had this to say,

“Last year we were protesting for decolonised education, sorry to mention that, it might not be relevant, but I am trying to bring relevance to answer your question. When we were protesting for decolonised free education, we were fighting for education that is relevant to our people and their problems. We cannot teach people the same things we taught their parents 20 years ago... and without telling them why they learn that” (interview with SS8).

Entrepreneurship

Two young secondary teachers were the ones who saw the garden as having the potential to instill from an early age the spirit of entrepreneurship among the learners,

“I think the garden will teach them basics of how to run a business for example, if they are involved with regards to running the dynamics of the garden, and they will learn a lot as learners and be able to use the knowledge and skills later in life” (interview with SS8).

Another early-career teacher elaborated, saying,

“The garden will have a way of influencing the choice of career for the learners, and also there is high level of unemployment: if learners learn how to survive using the garden and selling the produce, for example, by planting their own vegetables and selling them, they can be entrepreneurs and farmers and not look for jobs. I have a degree in chemistry from university, but I cannot get a job, and is not only me, hence I ended up doing PGCE, and from next year I will be a teacher when I graduate. It is also important to emphasise that not everyone will complete their matric, therefore the lessons in the garden can take learners a long way if they are taught in the garden” (interview with SS10).

The teacher used herself as an example in this case to explain the situation amongst South Africa young people. Her story is similar to many young people who cannot get jobs because their degrees are not marketable and they do not have skills and knowledge to do their own things, except to look for a job.

Independence

There is a general consensus among all interviewed teachers that when learners use the garden, they will be able to be more self-reliant and more independent. As one primary teacher who uses the garden explained:

“The aim is to encourage the learners to make their own vegetable garden at home, even though they might not get plants, they should know how to fertilise the soil, if their parents can allow them” (interview with PS2).

Similar views were shared and expanded on by a teacher at the secondary school despite not using the garden for teaching and learning:

“I think it can also teach them to be independent, to learn to survive, like through the garden you can survive. There are things like plants whereby at the end of the day, or when they are grown, you end up making money” (interview with SS5).

A teacher at the secondary school further argued that garden education is liberating because it does not create a dependency syndrome:

“If the learners work in the garden and produce the food that they eat, they will learn self-reliance and again they will not grow to expect handouts

from the government like their parents who always want RDPs and free water and electricity ... This is because they think you need a job to survive, but they have hands which they are not using” (interview with SS7).

Another teacher from the same school hypothesised that perhaps the reason why the education system does not encourage garden education is to ensure people stay poor:

“An education that help one meet their immediate needs and solving their problems, because if people cannot eat because they do not have jobs, then people should plant their own food to eat and even sell, that way they are self-reliant, but that will not happen because the government wants people to be poor, to give them free things so that they can get votes” (interview with SS8).

The above suggest that if people become self-reliant indeed there will be less reliance on the government because their lives become their own responsibilities and only hold the government accountable but do not depend on it for survival.

Responsible citizens

For some teachers at the secondary school, garden-based learning was also linked to responsible citizenship. By responsible citizens they implied people who take responsibilities and action to solving problems of society they are part and parcel of. Three teachers shared the same views about the garden raising responsible citizens, or “civic responsibility” as one put it (interview with SS13, not verbatim):

“If we use the garden to teach, the learners will become responsible citizens, they will have environmental awareness, they will not waste water since they understand the need, and they will not waste food, since they will be involved in the producing of food. We will raise responsible young men and women, and I think that is why the young leaders of Youth managers Foundation want to start a garden because already they have urgency, they just need your support and the support from the school” (interview with SS9).

“It was going to be a very good idea if learners were taught in the garden. Some will even take ownership of it and make it their project and grow it. Sometimes as teachers, we think that we know better than the learners because we are qualified. Yes we may be qualified, but some of these kids properly have gardens at home that are probably doing well and they can transfer the skills and strategies to the schools garden” (interview with SS11).

The last point was raised enthusiastically by a young teacher who recently joined the secondary school. This implies that while authority for teaching rests with the teachers, the learners also have power on what and how to teach.

Reconnecting to Nature

Finally, two teachers commented about reconnecting to nature through the garden. An older teacher from the primary school was saying that her learners did not grow up in rural areas and have never had the opportunity to connect with nature. A food garden would be the closest thing to nature that learners will have access to. She drew on her own childhood to make a case:

“It is very important to use the garden for teaching. For example, I grew up in the rural areas. After school and during holidays I will join my parents and help them with farming, I still remember what we did and I can do it even now. I was learning unconsciously and it kept me busy and active all the time” (interview with PS5).

A teacher from the secondary school also argued that there was a substantial disconnect from nature (interview with SS13, not verbatim). This was made worse, they argued, by media influencing people away from their natural form. They believed that children no longer eat the type of food they grew up eating; rather they eat what is advertised on the media. They are told that breakfast is the most important meal of the day, which for them was just a lie to get people to buy food that is being advertised: ‘We used to eat when we are hungry’. But now people are forced to eat all the time because of the media and also because they are not health conscious. The garden can change the mindset of learners from a young age (interview with SS13, not verbatim). The same teacher went on to say that learners will connect to nature when they taste the produce.

The same teacher from the secondary school held the view that food gardens are an opportunity for learners to learn about systems that they are not familiar with. They are also free greenspaces in urban areas that are still in their natural form. They thus thought it would be highly impactful to use the garden for teaching and learning (interview with SS13, not verbatim).

4.6 Conclusion

Above I reported the results according to the themes which emerged from analysis of the conducted interviews and results from participant observation at both schools. I started by first situating and introducing the two schools, starting with the primary school and then followed with the secondary school. In addition to contextualising the schools, I gave an overview of the food gardens' current status. I then presented more specific results from thematic analysis of my interviews. I analysed what the gardens are currently being used for in terms of practices at both schools. The garden is partially used for teaching and learning at the primary school as well as a punishment tool at both schools. Another use of the garden in both schools was for production of food. With regards to the challenges, both schools had more or less the same challenges concerning environmental conditions and weather, leadership as well as lack of resources and structural constraints. The last section was about future possibilities or imaginaries shared by teachers' vis-à-vis garden-based learning. This section unveiled possibilities of using the garden for teaching and learning. I will in the next chapter discuss the results or findings. The discussion situates the major findings in relation to policy, the scholarly literature, and in relation to the theoretical coordinates of this research.

Chapter 5: Discussion

The purpose of this study was to explore the relationship between food gardens and academic instruction across a number of 'ordinary' township schools in Soweto, Johannesburg. These schools did not have exceptional, award-winning garden projects to use as comparative models of best practice. Rather, as with most schools, their food gardens occupied a more mundane middle ground. It is from this ground that the practices, challenges and future imaginaries discussed in the results are drawn.

Overall, in the two schools that agreed to be part of this study, it was found that the gardens' uses were multiple and dynamic, changing over time in relation to a set of contextual factors. The gardens were also used differently and viewed differently by different staff members. The research showed academic instruction to be just one possible use. In both schools, the study revealed that the garden produce supplements the school feeding scheme programme or community food security more broadly. It also functions as a space of punishment. However, in the primary school, the garden was being used by some teachers for academic instruction, while at the secondary school it was not used for teaching and learning. This was due to a range of challenges which include lack of land and time, environmental challenges, lack of leadership and training, and old approaches to teaching and learning, among other structural constraints such as overcrowded classes, no sponsorship and no curricular imperative. Yet teachers, particularly newer ones, at both schools still saw great potential in using food gardens for building better theoretical and experiential knowledge; skills and independence.

These findings are similar to local and international findings about the role of school food gardens, but also show some differences. Each are addressed and developed further in what follows, first in relation to policy, then the literature and finally the theoretical coordinates.

5.1 The Study's Findings vis-à-vis Policy

The study's findings are in line with the objectives of the National School Nutrition Programme (NSNP). The NSNP, as discussed earlier, has three pillars. The first pillar is for offering meals through the feeding scheme programme in quantile 1 and quantile 3 schools of South Africa. This pillar has been more successfully implemented. As part of this programme, schools are urged to plant food gardens so that learners and their educators can grow vegetables and fruits (Laurie *et al.*, 2017), more often than not because the levels of poverty are extreme. The school garden may support families of learners attending schools gardens as found in the current study and previous studies (Moswane, 2015).

The second pillar of NSNP includes natural education programmes promoting healthy lifestyles (Laurie *et al.*, 2017). This pillar was in practice at the primary school food garden, but not at the secondary school food garden. There is a major contradiction between the curriculum and the policy objectives of NSNP. The curriculum at the schools I studied does not cater for garden education as proposed by the NSNP. For example, teachers I interviewed never mentioned the policy of NSNP, which could imply they do not know about it and its intentions. Therefore, there is a need to raise awareness among teachers. The government and its stakeholders must ensure that teachers are aware about the NSNP. Despite pillar 2 being the least developed, ideas came from the interviews with young teachers about the possibilities of garden-based learning, which are similar to the policy objectives. As learners participate in the garden and discuss what they are doing, they will be engaging with the teacher and fellow learners and thus creating more knowledge and sharing it among themselves. The teacher can also use the garden to assess the understanding of learners, for example, if they are able to identify the things the teachers are talking about in real life. The garden can also be used to assess how teaching and learning can be improved. Garden-based learning is inclusive as it offers alternative learning opportunities that do not exist in the classroom. How these opportunities differ across different levels of schooling – primary versus secondary – is also important to consider.

The third pillar of the NSNP is called Sustainable Food Production in schools (SFPS) which encourages the production of food as well as the transfer of skills (Laurie *et al.*, 2017). In terms of sustainable production of food, the gardens are contributing to the feeding scheme, although at low levels. The school food gardens also do not at presently address this objective about skills transfer from the NSNP. The policy is there, but the challenge is implementation of the policy. Aside from school gardens contributing to feeding schemes, the other two pillars have received less practical and scholarly attention so far. These are worth developing further, given the ideas and possibilities mapped out by educators themselves in my study.

There were other findings from my study which were not in line with the objectives of NSNP. For example, the food gardens in both the primary and secondary schools have been reported to be spaces where learners are sent to be punished. The use of the garden to punish learners is a problematic practice in my view. Punishment is a strategy used to deal with learners who are not responding to the curriculum. Punishment is used after assessment, when a learner has not been able to do an assignment or perform satisfactorily in an assessment; they are punished by being sent to the garden. The use of the garden for punishment is not in line with an empowerment perspective. The intentions of using the gardens must be deliberate and clear. Using a garden to punish learners may create a positive or negative feedback depending on the response of the learner. If the learner enjoys working in the garden and doing the garden activity, they may resort to not doing school work so that they can spend more time there. If the learner does not enjoy working in the garden, they may do the school work or even be encouraged to perform better or if they arrive late, they may stop arriving late because they do not want to work in the garden. In general, using the garden for punishment creates a mindset in young people that it is not a space for learning but for paying for mistakes or wrong doings, and learners may grow not to value the garden or GBL. The use of the garden as a space to punish learners speaks to the fact that there are still old practices in place where the garden has historically been a space to punish the learners. New approaches, however, see the garden as

an empowerment tool, in the manner imagined by the SEED model that is equipping and empowering students to stand on their own after completing the programme.

The study of Blair (2009) also revealed similarly contradictory perspectives about food gardens: there is a perspective of showing children the wonder and the beauty of the world and there is one perspective of using the garden to instill discipline in juveniles (Blair, 2009). The first perspective was more manifest at the primary school and the second one at the secondary school.

5.2 The Study's Findings vis-à-vis the Literature and Theoretical Coordinates

In relation to the wider literature on community food gardens and organised garden projects elsewhere, my results shared similarities with many studies which reveal that school food gardens can be used as tools for academic instruction in addition to feeding schemes. While the latter was more prominent in practice, some teachers' practices and future imaginaries demonstrated the possibilities of the former. For example, the creation of compost by both teachers and learners from the primary school showed participation in garden education. They had to raise their hands to ask questions and to give answers, which is important for better communications well as team work. Even for learners who were deemed incompetent in class were getting involved and engaged in the garden. This confirms Beery *et al's* (2014) study which found that children may learn many skills through the garden, for instance, communication skills, financial and entrepreneurial skills, team work, problem solving skills, and other skills which are important (Beery *et al.*, 2014). Teachers from both schools acknowledged that being exposed and participating in the school garden can improve environmental awareness and health consciousness - again similar to the findings of Beery *et al* (2014) as well as Blair (2009) and Cairns (2017) that food gardens were able to change the perceptions and encourage healthy eating.

Gardens globally and locally have similar challenges as confirmed by this study and the study by Blair (2009). The study found a number of challenges affecting the both the school food gardens which have been mentioned in Chapter 4.4, the challenges included but were not limited to lack of funding or sponsorship, tired teachers, lack of committed volunteers, as well as lack of space and land. The primary school challenges included environmental and climatic challenges as well as household challenges which affected the participation of learners from the perspective of teachers, and the secondary school challenges had to do more with human resources, to be more specific leadership challenges. In the context of South Africa, public schools are generally having a crisis of more learners per teacher as well as underfunding (Legotlo, 2014). These challenges then make it difficult for teachers to have spare time to perform extra-curricular activities since garden based education is not yet part of school curricula in South African schools.

Furthermore, in South Africa, Möller (2005) mentions that gardening suffers from an image problem, being associated with an old-fashioned lifestyle. This is echoed in a study by Battersby and Marshak (2013) that revealed that the younger generation had different views about participating in gardening. They viewed it as old-fashioned and undesirable (Battersby and Marshak, 2013). However in this study, it was the younger teachers who were more excited about the possibilities of garden-based learning than the 10 older teachers from both schools. The younger teachers are passionate and keen to bring about change. This is very critical as they could be the ones to lead the implementation of garden-based education. While the resource challenges of enabling gardening would also need attention, given that the new teachers are still creative and innovative and have urgency, focusing on them as implementers may possibly save government resources. The current study contributes on how school food gardens and gardening in general can be made fashionable, for example by including technology and aquaponics as observed by one young teacher.

Of course, all this is taking place within a particular context. Although there was only one teacher who explicitly mentioned how the garden could connect to decolonising education, all the young teachers and their recent training have been steeped in the momentum around ‘decolonising higher education’ and the call to ‘free, quality, decolonised education’ that has resounded across the country’s campuses over the last few years. This is a structuring debate of our time, and might go some distance towards understanding newly-trained teachers’ enthusiasm for alternative and experiential learning. The different ideologies of young and old teachers in the context of South Africa can mean many things, but in this research it can be read as a result of a new generation of teachers that were exposed and have been part of a generation calling for decolonised education under “Rhodes must fall” and “Fees must fall” (Pillay, 2016).

One aspect that came out more strongly in my research than in some of the literature was around the possibilities of building independence through garden-based learning. Independence is, of course, critical to the kinds of emancipatory, liberating education as conceptualised by Freire (1970). Paulo Freire did work on the education of the illiterate adults of the world, and introduced “problem-posing education” as an instrument of liberation that gives people the necessary skills for survival and independence. Unlike the banking concept of education, problem-posing education is concerned with real issues (Freire, 1970). Most learners do not know why they go to schools or why they learn what they have to learn, but the garden because it is more of a complete system can be a practical example of why people should learn something and the benefits thereof. As the teacher’s responses in chapter 4.5 demonstrate, school food gardens could potentially instill a spirit of entrepreneurship among the learners. The teachers acknowledged that entrepreneurship skills are not transferable through theory but practice, hence GBL is significant since it creates suitable space for that kind of learning. These perspectives were connected to a wider pedagogy shared particularly by the younger teachers I interviewed who are about to complete or have recently completed their teaching qualifications. They largely view education as a tool of

empowerment, transformation and liberation, in line with Freire. This is confirmed by statements of seven young teachers who reflected on this view.

Another critical pedagogue, Maria Montessori also commented profoundly about the relationship between food gardens and education. She emphasised that experiences in the garden promote what no book can promote. The responses of a few teachers similarly revealed that learners have limited interaction with nature, to the detriment of experiential learning. This is exacerbated by television and videos, confirming the findings of Blair (2009) when he speaks about television and video games taking time away from children's exposure to the environment in the US context. Montessori also mentioned that experiential learning creates intelligent thinkers, and education in the garden prepares learners for household duties which are significant for survival and independence (Alexandra *et al.*, 1995). The majority of teachers from both schools shared the same sentiments. There was also a consensus among teachers from both schools that the garden exposes learners to biological and agricultural knowledge in the sense that, when the learners are taught in the garden, they grow to learn the process and systems about gardening as well as the purposes and functions of the school food garden as mentioned in chapter 4.5 of the results section.

5.3 Conclusion

I have discussed the major findings in relation to policy, the scholarly literature, as well as in relation to the theoretical coordinates of this research. With regards to policy it was around the NSNP and its three pillars. The first pillar of NSNP is about feeding schemes and was successfully achieved by both schools. The second pillar is about natural education to promote healthy lifestyles. This was only in practice at the primary school and not at the secondary school. The third pillar of NSNP is about Sustainable Food Production in School (SFPS), to encourage production of food and skills transfer. In both the schools it was not achieved. This study also adds to the limited literature on school food gardens in the context of South Africa.

What follows is the conclusion. The conclusion returns to the study's original objectives, and highlights both the theoretical contributions of this study as well as possible programmatic and policy recommendations from this study. It also outlines avenues for future research.

Chapter 6: Conclusion

This study focused on two township schools – one primary, one secondary school - in Soweto, Johannesburg, South Africa, and the role of food gardens therein vis-à-vis academic instruction. The results were derived from comparative thematic analysis of qualitative data which was collected at both schools for a period of one month and two weeks in 2017. Along with a rich set of literature on community gardens, the study was framed by Paulo Freire's theorising of emancipatory pedagogy, as well as Maria Montessori's notion of experiential learning. The study built on my previous honours research focused on garden volunteers' role in using one school's garden in another part of Soweto for education. After looking at the volunteers' role, I was inspired to expand my research at Master's level to look at the experience and perception of educators around garden-based education across a number of other schools.

My research objectives for this study were threefold. First, to investigate how teachers who work in the schools use the school food garden for teaching the pupils. Secondly, to explore how school food gardens can be used to equip learners with relevant skills needed in the economy. And thirdly, to investigate how garden-based learning can be integrated in the future school curriculum for pupils. My overall findings respectively were that it is evident that in both schools, learners did not acquire the practical skills that the garden affords them since at the secondary school they are not using the garden for teaching and learning and at the primary school, they watch and learn from a distance without using their hands. It was found that the garden is being used by the primary teachers for some theoretical academic instruction as well as for recycling and creating compost. However, at the secondary school the garden is not used for teaching and learning. In both schools, the gardens constitute spaces of punishment for learners. This is in line with findings from Blair (2009) which revealed that the garden programme was used for instilling discipline in unruly juveniles (Dirkis and Orvis, 2005).

With regards to how school food gardens can be used to equip learners, it was found that despite a range of challenges in practice, teachers were generally positive about the possibilities the garden offered to equip the learners with practical skills that classroom education does not offer. This study seeks to take these perspectives seriously, in the spirit of PAR. Teachers shared visions of how the garden can be used to empower learners with communication skills, team work, interpersonal skills, financial skills and entrepreneurial skills if the garden is properly used for academic instruction. The garden can be used also to teach about aquaponics which involves technological farming as part of the future curriculum among other things. However, there was a generational tension around the possibilities of garden-based learning - where older teachers were more reluctant, perhaps given past experiences, and the younger teachers are pushing and excited for change.

With these findings, the dissertation contributes to the literature on school food gardens internationally by adding a 'southern' perspective beyond the frame of food insecurity. It also contributes to the South African literature, where the study brings a distinctly qualitative contribution to the quantitative work of others on school food gardens (c.f. Laurie *et al.* 2017). To my knowledge this is the first study in Johannesburg to focus solely on the experiences and perceptions of teachers in using school food gardens for academic instruction. While the findings from my research cannot be generalised, they offer insight into organised food gardens, and particularly their challenges and future possibilities. The results showed similarities with other studies that school food gardens can be used as tools for academic instruction, alongside supplementing feeding schemes. For example in California food gardens are being used as tools for academic instruction. The state achieves this with partners like the National Garden Association which provides education for teachers (Graham *et al.*, 2005). The study also revealed how new technologies can be used to make farming fashionable. Yet, there are distinct local challenges to operationalising garden-based learning. In this study, these ranged from serious resource challenges for both schools and the households they service (in terms of budget, class size, etc.),

to leadership and environmental challenges, to curricular constraints with little time to go ‘off script’, as well as old approaches to teaching, learning and gardening itself.

Given this range of resource, leadership and intergenerational challenges, integration of the garden into the future curriculum is not necessarily straightforward. Below are some recommendations for achieving this.

6.1 Recommendations for practice

The utilisation of school gardens to teach requires a multi-disciplinary approach and effort as well as working together by garden coordinators, teachers and other involved stakeholders. A garden coordinator is a teacher or a volunteer worker or someone who works in the school for maintenance and also takes care of the school garden. Moving forward, in particular at the secondary school, there is an urgent need for the school leadership, teachers and community members to create a healthy working relationship around their multiple uses of the garden. Another significant recommendation is for teachers to stop using the garden for punishment purposes as it may change the paradigm of learners from valuing gardening to hating it based on how it is used momentarily.

Although teachers at the primary schools are in favour of environmental education as advised by Dirks and Orvis (2005), who said that hands-on-learning can be included in all forms of curriculum to encourage interest in science as well as environmental awareness, the teachers at the primary school noted a few challenges, which can be managed. For example, they mentioned that school uniforms become dirty when the learners participate in garden education physically. To avoid this, teachers working together with parents could write letters on days when gardening will be taking place to advise parents that learners will be involved in garden-based learning so that they wear old clothes, for example on Fridays. With regards to environmental and climatic challenges, aquaponics methods of farming are a possible solution, although costly.

Aquaponics compared to old farming methods produce more per square meter and use less water. This implies that the use of water and land will be reduced.

At the secondary school, the challenge of alternating leadership can be solved by disseminating the NSNP and manuals to all teachers, SGB as well as garden coordinators so that they know about it, no matter who is in charge.

Drawing inspiration from California, which in 1996 had school gardens in 13% of schools and of those, 85% were used for academic instruction, they achieved this milestone with state partners like the National Garden Association (NGA) providing teachers with education (Blair, 2009) In South Africa, the Department of Basic Education must partner with organisations to train teachers on school food garden programmes. The schools, when hiring maintenance people, must also ensure that the maintenance people are multi-skilled, in the sense that they should be able to assist as a garden coordinator. When the garden coordinator is there will always be someone to hold accountable.

More broadly, the Department of Basic Education must incorporate garden-based education in the curriculum and allocate time so that it is not regarded as an extra-curricular activity, but forms part of actual curriculum. Prior to this, teachers must be trained and educated on how to go about delivering the content and training the learners on garden-based education. When GBL is part of the curriculum, teachers will have a curriculum-based goal to take learners to the garden as it will be part of their work, and necessary to achieve this.

6.2 Limitations and Avenues for Future Research

I have already reflected on the methodological challenges I faced in carrying out this study. Research within institutional settings has its own challenges, particularly around access and time, but also ethics. These are all heightened in the school context especially. These challenges might indicate why there is less research on 'organised', institutional garden projects than 'community' ones.

If more time was possible for my research, I could have approached more schools to participate in the study, as well as done more participant observation in the gardens across seasons. I could also have interviewed teachers who were too busy during that term. All of these would offer avenues for future research.

Furthermore, the perspectives of younger teachers with regards to the use of technology opens a new opportunity for further research on the role of teaching in school food gardens combined with technology (for example, aquaponics). This might contribute to making school gardens more appealing and fashionable for young people.

Understanding learners and young people's own perspectives of the garden and garden-based learning would also greatly enrich future research. However, a careful ethical process would need to be adhered to facilitate this.

Finally, it is also necessary to explore how new teachers are being trained in higher education institutions about garden-based learning and problem-based education more generally. That research would offer future guidance on how to better capacitate teachers going forward, and help contribute to building a more emancipatory notion of education.

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Appendices

Appendix A - Participants Information Sheet

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Participant information sheet – all potential participants

Dear potential participant,

My name is Moswane Mafule, and I'm a Masters student in the department of Geography, Archaeology and Environmental Studies at the University of Witwatersrand, Johannesburg. For my studies I have to undertake a research project, and I am exploring the relationship between food gardens and learning for teachers and curriculum development at three schools in Soweto. My project is titled "Food gardens and learning: investigating school food gardens as tools for academic instruction in Soweto, Johannesburg". The aim of this research is to find out how school food gardens are currently being used for curricula purposes and educational benefits across different schools, and how that might be further enabled.

As part of this project I would like to invite you to take part in the research. As an educator or volunteer in the school garden, I would greatly appreciate your time and insights. I will be conducting both semi-structured interviews and participating in the gardens themselves. Interviews will be conducted by me, and will take approximately 45 minutes on the school grounds. With your permission, the interview will be audio-taped and later transcribed for the purpose of more accurate data analysis. Participating in the garden will involve me working and observing alongside educators and volunteers with their agreement. With your permission, I would also like to take photographs of the gardens.

Participation in this study is voluntary; refusal to participate will not involve any form of punishment. You are free to withdraw and discontinue participation in this project at any time without prejudice or penalty. You are free to refuse to answer any question I might ask you. Potential risks and discomforts include possible emotional feelings when asked questions during the interview. The potential benefits of participating in the study include a chance to raise your ideas, feelings and perceptions about educational opportunities of the food garden and contributing to development of curriculum for the schools.

The information gathered during this study will remain securely in my possession during the project. It is only the researcher who will have access to the information to protect confidentiality. There will not be any identifying of names

on interviews transcripts. Recordings will be destroyed at the completion of the study. The results of the research will be available in my Masters thesis (which will be available in the Wits library and online), and may be published in a professional journal or presented at a professional meeting. If you wish to receive a summary of the research, I will be happy to send it to you.

Thank you for considering this invitation to participate. The knowledge obtained from this study will be of great value and will guide schools in using the garden effectively for academic purposes. You are welcome to ask me any questions that occur during the research. If you have further questions once the research is completed, you are encouraged to contact me or my supervisor using the contact information given below.

Yours sincerely

Researcher name: Mafule Moswane
Email: 539599@students.wits.ac.za
Phone number: 0791172018

Supervisor: Dr. Siân Butcher
Email: sian.butcher@wits.ac.za,
Phone number: 011 717 6573]

Appendix B - Consent form for interview participants

School of Geography, Archaeology and Environmental Studies

Private Bag 3, Wits 2050, South Africa Enquiries: **GEOGRAPHY:** TEL: +27 11 717-6503 • FAX: +27 086 651 6366
ARCHAEOLOGY: TEL: +27 11 717-6045 • FAX: +27 086 651 6366
<http://www.wits.ac.za/geography/>



Formal consent form – all potential interview participants

I (Name, print clearly), freely agree to participate in Mafule Moswane's project "Food gardens and learning: investigating school food gardens as tools for academic instruction in Soweto, Johannesburg".

He has explained the following:

- He is a Masters student in the department of Geography, Archaeology and Environmental Studies at the University of Witwatersrand, Johannesburg.
- His research explores the relationship between food gardens and learning for teachers and curriculum development at three schools in Soweto.
- I have been invited to participate as an educator in one of these schools using food gardens.
- As participation is voluntary, I am free to refuse to answer any question and to withdraw from the study at any time.
- The interview material will remain confidential, within the protection of the researcher, and used for his Masters dissertation.
- My responses will be kept anonymous.
- I am welcome to ask any questions during the interview or once the interview is completed, using the contact information provided.
- I am welcome to ask for a summary of the research after completion.

I agree to be interviewed for this research YES NO (please circle)

I agree that my participation will remain anonymous YES NO

I agree that the researcher may use anonymous quotes YES NO

I agree that the interview may be audio recorded YES NO

Participant

..... (signature)

..... (name of participant)

..... (date)

Researcher

..... (signature)

..... (name of participant)

..... (date)

Appendix C – Consent for participant information

School of Geography, Archaeology and Environmental Studies

Private Bag 3, Wits 2050, South Africa Enquiries: **GEOGRAPHY:** TEL: +27 11 717-6503 • FAX: +27 086 651 6366
ARCHAEOLOGY: TEL: +27 11 717-6045 • FAX: +27 086 651 6366
<http://www.wits.ac.za/geography/>



Formal consent form – all potential participant observation participants

I (Name, print clearly), freely agree to participate in Mafule Moswane's project "Food gardens and learning: investigating school food gardens as tools for academic instruction in Soweto, Johannesburg".

He has explained the following:

- He is a Masters student in the department of Geography, Archaeology and Environmental Studies at the University of Witwatersrand, Johannesburg.
- His research explores the relationship between food gardens and learning for teachers and curriculum development at three schools in Soweto.
- I have been invited to participate as an educator or volunteer worker in one of these schools using food gardens.
- As participation is voluntary, I am free to refuse to be observed, to be photographed, to answer any question and to withdraw from the study at any time.
- The field notes and photographs from garden observations will remain confidential, within the protection of the researcher, and used for his Masters dissertation.
- I am welcome to ask any questions during the observations or research, or once the research is completed, using the contact information provided.
- I am welcome to ask for a summary of the research after completion.

I agree to be observed as I use the garden YES NO (please circle)

I agree to having general photographs taken in the garden YES NO

I agree that the researcher may use anonymous quotes from our conversations YES NO

Participant

..... (signature)

..... (name of participant)

..... (date)

Researcher

..... (signature)

..... (name of participant)

..... (date)

Appendix D – Interview Schedule

Interview Schedule

The interview will take about 30 to 45 minutes or less.

1. Can you tell me who you are and how long have you been in the school?
2. Do you or any other teacher in the school use the school food garden for any purposes?
3. For what kind of purposes is the garden being used for?
4. How is the garden being used for teaching and learning and how often?
5. What is your view in using the garden as a tool for learning?
6. What unique aspect in learning does the garden offers which are not already offered?
7. How can garden based learning be integrated in the school curriculum?
8. What skills does the garden afford the learners and teachers at school?
9. What are the challenges with the garden as well as using the garden as a tool for academic instruction?

Appendix E – Gauteng Department of Education Research Permission



GAUTENG PROVINCE
Department: Education
REPUBLIC OF SOUTH AFRICA

8/4/1/2

GDE RESEARCH APPROVAL LETTER

Date:	30 May 2017
Validity of Research Approval:	06 February 2017 – 29 September 2017 2017/121
Name of Researcher:	Moswane M.M
Address of Researcher:	85 Dube Street Wattville Benoni, 1501
Telephone Number:	079 117 2018
Email address:	539599@students.wits.ac.za
Research Topic:	Food gardens and learning: Investigating food gardens as tools for academic instruction in Soweto, Johannesburg, South Africa
Number and type of schools:	Two Primary Schools and One Secondary School
District/s/HO	Johannesburg South

Re: Approval in Respect of Request to Conduct Research

This letter serves to indicate that approval is hereby granted to the above-mentioned researcher to proceed with research in respect of the study indicated above. The onus rests with the researcher to negotiate appropriate and relevant time schedules with the school/s and/or offices involved to conduct the research. A separate copy of this letter must be presented to both the School (both Principal and SGB) and the District/Head Office Senior Manager confirming that permission has been granted for the research to be conducted.

Y. Q. M. 30/05/2017
The following conditions apply to GDE research. The researcher may proceed with the above study subject to the conditions listed below being met. Approval may be withdrawn should any of the conditions listed below be flouted: 1

Making education a societal priority

Office of the Director: Education Research and Knowledge Management

7th Floor, 17 Simmonds Street, Johannesburg, 2001

Tel: (011) 355 0488

Email: Faith.Tshabalala@gauteng.gov.za

Website: www.education.gpg.gov.za

1. The District/Head Office Senior Manager/s concerned must be presented with a copy of this letter that would indicate that the said researcher/s has/have been granted permission from the Gauteng Department of Education to conduct the research study.
2. The District/Head Office Senior Manager/s must be approached separately, and in writing, for permission to involve District/Head Office Officials in the project.
3. A copy of this letter must be forwarded to the school principal and the chairperson of the School Governing Body (SGB) that would indicate that the researcher/s have been granted permission from the Gauteng Department of Education to conduct the research study.
4. A letter / document that outlines the purpose of the research and the anticipated outcomes of such research must be made available to the principals, SGBs and District/Head Office Senior Managers of the schools and districts/offices concerned, respectively.
5. The Researcher will make every effort obtain the goodwill and co-operation of all the GDE officials, principals, and chairpersons of the SGBs, teachers and learners involved. Persons who offer their co-operation will not receive additional remuneration from the Department while those that opt not to participate will not be penalised in any way.
6. Research may only be conducted after school hours so that the normal school programme is not interrupted. The Principal (if at a school) and/or Director (if at a district/head office) must be consulted about an appropriate time when the researcher/s may carry out their research at the sites that they manage.
7. Research may only commence from the second week of February and must be concluded before the beginning of the last quarter of the academic year. If incomplete, an amended Research Approval letter may be requested to conduct research in the following year.
8. Items 6 and 7 will not apply to any research effort being undertaken on behalf of the GDE. Such research will have been commissioned and be paid for by the Gauteng Department of Education.
9. It is the researcher's responsibility to obtain written parental consent of all learners that are expected to participate in the study.
10. The researcher is responsible for supplying and utilising his/her own research resources, such as stationery, photocopies, transport, faxes and telephones and should not depend on the goodwill of the institutions and/or the offices visited for supplying such resources.
11. The names of the GDE officials, schools, principals, parents, teachers and learners that participate in the study may not appear in the research report without the written consent of each of these individuals and/or organisations.
12. On completion of the study the researcher/s must supply the Director: Knowledge Management & Research with one Hard Cover bound and an electronic copy of the research.
13. The researcher may be expected to provide short presentations on the purpose, findings and recommendations of his/her research to both GDE officials and the schools concerned.
14. Should the researcher have been involved with research at a school and/or a district/head office level, the Director concerned must also be supplied with a brief summary of the purpose, findings and recommendations of the research study.

The Gauteng Department of Education wishes you well in this important undertaking and looks forward to examining the findings of your research study.

Kind regards



Ms Faith Tshabalala
CES: Education Research and Knowledge Management

DATE: 30/05/2017

Office of the Director: Education Research and Knowledge Management

7th Floor, 17 Simmonds Street, Johannesburg, 2001

Tel: (011) 355 0486

Email: Faith.Tshabalala@gauteng.gov.za

Website: www.education.gpg.gov.za

Appendix F – Wits Ethics Committee certificate



Research Office

HUMAN RESEARCH ETHICS COMMITTEE (NON-MEDICAL)
R14/49 Moswane

CLEARANCE CERTIFICATE

PROTOCOL NUMBER: H17/06/34

PROJECT TITLE

Food gardens and learning: Investigating food gardens as tools for academic instruction in Soweto, Johannesburg, South Africa

INVESTIGATOR(S)

Mr M Moswane

SCHOOL/DEPARTMENT

Geography, Archaeology and Environmental Studies/

DATE CONSIDERED

30 June 2017

DECISION OF THE COMMITTEE

Approved

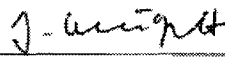
EXPIRY DATE

27 August 2020

DATE

28 August 2017

CHAIRPERSON


(Professor J Knight)

cc: Supervisor : Dr S Butcher

DECLARATION OF INVESTIGATOR(S)

To be completed in duplicate and ONE COPY returned to the Secretary at Room 10004, 10th Floor, Senate House, University. Unreported changes to the application may invalidate the clearance given by the HREC (Non-Medical)

I/We fully understand the conditions under which I am/we are authorized to carry out the abovementioned research and I/we guarantee to ensure compliance with these conditions. Should any departure to be contemplated from the research procedure as approved I/we undertake to resubmit the protocol to the Committee. I agree to completion of a yearly progress report.

Signature

Date

PLEASE QUOTE THE PROTOCOL NUMBER ON ALL ENQUIRIES