Perceptions of best practices for sustainable school-based vegetable gardens

Janine Ellenore De Bruin

2017

Perceptions of best practices for sustainable school-based vegetable gardens

by

Janine Ellenore De Bruin

Submitted in partial fulfillment of the requirements for the degree

MAGISTER EDUCATIONIS
(Educational Psychology)

Department of Educational Psychology
Faculty of Education
University of Pretoria

SUPERVISOR
Ms Karien Botha

CO-SUPERVISOR
Prof Ronél Ferreira

PRETORIA
2017

DECLARATION OF AUTHENTICITY

I, Janine Ellenore de Bruin (student nr: 26097908), declare that the mini-dissertation, which I hereby submit for the degree Magister Educationis in Educational Psychology at the University of Pretoria, is my own work and has not previously been submitted by me for a degree at this or any other tertiary institution.

_____ _____

Janine Ellenore de Bruin **Date**

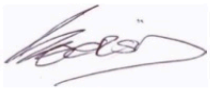
ETHICS CLEARANCE CERTIFICATE

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA
Faculty of Education

RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	CLEARANCE NUMBER: **EP 06 11 01 Ferreira 16-003**
DEGREE AND PROJECT	MEd Perceptions of best practices for sustainable school-based vegetable gardens
INVESTIGATOR	Ms Janine de Bruin
DEPARTMENT	Educational Psychology
APPROVAL TO COMMENCE STUDY	11 November 2016
DATE OF CLEARANCE CERTIFICATE	29 November 2017

CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn



CC

Ms Bronwynne Swarts
Ms Karien Botha
Prof Ronel Ferreira

This Ethics Clearance Certificate should be read in conjunction with the Integrated Declaration Form (D08) which specifies details regarding:

- Compliance with approved research protocol,
- No significant changes,
- Informed consent/assent,
- Adverse experience or undue risk,
- Registered title, and
- Data storage requirements.

ETHICS STATEMENT

The author, whose name appears on the title page of this mini-dissertation, has obtained, for the research described in this work, the applicable research ethics approval. The author declares she has observed the ethical standards required in terms of the University of Pretoria's *Code of ethics for researchers and the Policy guidelines for responsible research.*

_____ _____

Janine Ellenore de Bruin **Date**

ABSTRACT

Supervisor: Mrs Karien Botha
Co-supervisor: Prof Ronél Ferreira
Degree: MEd (Educational Psychology)

The purpose of this study was to explore and describe the perceptions of key role-players on best practices for sustainable school-based vegetable gardens in a resource-constrained community in the Nelson Mandela Metropole, Eastern Cape Province. The study forms part of a broader research project, which aims to investigate how sustainable school-based vegetable gardens may promote resilience in resource-constrained communities.

I utilised an interpretivist paradigm as meta-theory and followed a qualitative research approach. I selected an instrumental case study design, applying Participatory Reflection and Action (PRA) principles, thereby aligning my study's design to the broader research project for data generation and documentation. I relied on multiple data generation strategies, such as, PRA-based workshops, observation, field notes, audio-visual data, a semi-structured interview and a research diary to generate and document data.

Following inductive thematic analysis, two main themes and related sub-themes emerged. The first theme relates to the value of school-based vegetable gardens, reflecting the provision of food and nutrition, skills acquisition and the practical application of the curriculum. Secondly, sustaining school-based vegetable gardens was identified as a theme, indicating the mobilisation of human resources, attending to environmental conditions, establishing the required infrastructure, accessing and enhancing knowledge, as well as continued planning and monitoring as factors affecting the sustainability of school-based vegetable gardens.

The findings of this study indicate that participants view school-based vegetable gardens as valuable and beneficial for learners in terms of nutritional supplementation and enhancement on a microsystemic level. On an exosystemic level, school-based vegetable gardens have value for schools in terms of adding nutrition by means of fresh vegetables for school kitchens or school feeding schemes. Furthermore, I conclude that school-based vegetable gardens hold value for teachers as they may get the opportunity to buy fresh produce from the school. Finally, on a macro systemic level, school-based vegetable gardens imply value for the broader community as school grounds can e.g. be used by underprivileged parents to plant vegetables for their families. Thus, schools can support the wider community by providing produce from vegetable gardens to the elderly, sick and vulnerable members of communities. This can lead to more nutritional food being made available to families who may not have sufficient food intake.

DECLARATION FROM LANGUAGE EDITOR

GENEVIEVE WOOD
P.O. BOX 511 WITS 2050 | 0616387159

EDITING CERTIFICATE
LANGUAGE EDITING SERVICES

Date: 2017/11/29

I, Genevieve Wood, the undersigned, hereby certify that I have revised the language of the dissertation titled

Perceptions of best practices for sustainable school-based vegetable gardens
by Janine De Bruin

and have found the standard of the language acceptable provided the indicated alterations have been made.

Genevieve Wood
PhD candidate
Wits University

LIST OF KEY WORDS AND ABBREVIATIONS

Keywords

- Best practices
- Key role-players
    - Teacher
    - Principal
    - Community members
- Participatory Reflection and Action
- Perceptions
- Resource-constrained communities
- Sustainable school-based vegetable gardens

Abbreviations

- Acquired Immune Deficiency Syndrome (AIDS)
- Department of Basic Education (DBE)
- Department of Health (DoH)
- Food and Agricultural Organisation of the United Nations (FAO)
- Food Intake and Resilience Support: Gardens as Taught by Educators (FIRST GATE)
- General Household Survey (GHS)
- Human Immunodeficiency Virus (HIV)
- Institute Of Medicine (IOM)
- Integrated Nutrition Programme (INP)
- International Food Policy Research Institute (IFPRI)
- Millennium Development Goals (MDGs)
- National Food Consumption Survey (NFCS)
- National Health and Nutrition Examination Survey (NHANES)
- National School Nutrition Programme (NSNP)
- Non-Government Organisations (NGOs)
- Participatory Reflection and Action (PRA)

- Recommendation Daily Allowance (RDA)
- Reconstruction and Development Programme (RDP)
- Scaling Up Nutrition (SUN)
- Supporting Home Environments in Beating Adversity (SHEBA)
- Supportive Teachers, Assets and Resilience (STAR)
- Sustainable Development Goals (SDGs)
- United Nations (UN)
- United Nations Department of Social and Economical Affairs (UNDSEA)
- World Food Programme (WFP)
- World Health Organization (WHO)

ACKNOWLEDGEMENTS

- My supervisor - Mrs. Karien Botha: Thank you for all your hard work. Thank you for allowing me to make this research my own and granting me the freedom to be the researcher I want to be. Your approach as supervisor has helped me to grow as a researcher.

- My co-supervisor - Prof. Ronél Ferreira: You are a dynamic woman and professional. Thank you for your hard work and support. Your passion for making a difference through our research is inspiring.

- My King, Jesus Christ - You never left me, even when I deserved it. I cannot express my gratitude in words. Thank you for Your grace.

- My wonderful husband, Rhynhardt de Bruin - You supported me throughout this whole journey. You are my best friend and my hero. Thank you for believing in me, motivating me and allowing me to follow my dreams. Thank you for being an amazing companion on this long journey. Thank you for all the sacrifices you made for us. I love you and admire you. You are an incredible man.

- My mom and dad - Magda and Martin Willemse: Thank you for all the support and love. Thank you for always being there and for believing in me. Thank you for all your sacrifices along the way. I love you.

- My other parents - Mariaan and Gerhard de Bruin: Thank you for all the support and love, for all the prayers and every phone call to check that I am still alive. I love you.

- My church family, LIG.punt - Thank you for ALL the prayers, advice and love. Thank you for all your support and words of encouragement. I couldn't have finished this without you. You mean the world to me. Calling you family is an incredible privilege. I have so much love for you.

- The FIRST GATE project team - Thank you for your contribution towards this research.

- My language editor – Ms. Genevieve Wood: Thank you for all the hard work and effort you put in and for the professional standard you uphold.

- The National Research Fund - Thank you for your financial contribution to this research, which allowed me to put these findings in a format that others can have access to.

FINANCIAL ASSISTANCE

The financial support of the following institution for funding:

- National Research Fund (NRF)

is hereby acknowledged and appreciated. Opinions expressed and conclusions arrived at are those of the author and cannot necessarily be attributed to this institution.

TABLE OF CONTENT

Page

CHAPTER 2
LITERATURE REVIEW

Page

CHAPTER 3
RESEARCH METHODOLOGY

Page

CHAPTER 4
RESULTS AND RESEARCH FINDINGS

Page

CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

LIST OF FIGURES, TABLES AND PHOTOGRAPHS

CHAPTER 1

INTRODUCTION AND GENERAL ORIENTATION

1.1 INTRODUCTION AND RATIONALE FOR UNDERTAKING THE STUDY

The current study forms part of a broader project that followed on from two other research projects undertaken by the University of Pretoria. The initial longitudinal research project STAR[1] commenced in 2003, and entailed a community engagement project (Ferreira & Ebersöhn, 2012), on the manner in which teachers and schools may promote resilience amongst vulnerable learners and their families, by implementing the asset-based approach. For this project, teachers initiated school-based psychosocial support projects in order to support their communities to cope with the risks and adversities related to HIV & AIDS. As the broader research project progressed, the teacher-participants raised the need to also involve community volunteers, who could potentially support community members to cope with adversity. Based on this identified need, a follow-up project was initiated, which became known as the SHEBA[2] intervention (Ferreira, 2015).

Since 2003, participating teachers in the STAR project, as well as volunteers involved in the SHEBA project, have explored the possibility of school-based vegetable gardens as a way of supporting vulnerable learners and members of the community. Against this background and based on the need voiced by the STAR and SHEBA participants to support vulnerable learners as well as the broader community by means of school-based vegetable gardens, the FIRST GATE[3] project was initiated (of which this study is a constitutive part). The FIRST GATE project investigates how sustainable school-based vegetable gardens may promote resilience in resource-constrained communities. The current study formed part of the first phase of the FIRST GATE project, explaining the perceptions of key role-players in terms of best practices for sustainable school-based vegetable gardens. To this end, five partnering schools that have attempted to sustain school-based vegetable gardens since 2005 were involved.

The inherent value of community development initiatives provided a rationale for the study. I argue that one of the ways in which resource-constrained communities can be

[1] Supportive Teachers, Assets and Resilience (STAR)
[2] Supporting Home Environments in Beating Adversity (SHEBA)
[3] Food Intake and Resilience Support: Gardens as Taught by Educators (FIRST GATE)

supported to become self-sustainable, is by initiating and sustaining vegetable gardens. In this regard, Rousseau, Gandhi, Dewey and Montessori (in Subramaniam, 2002) all promote school-based vegetable gardens as valuable assets to communities, with potential benefits to learners, parents, schools and surrounding communities. School-based vegetable gardens can provide holistic food and nutrition education (Faddegon, 2005; Thorp & Townsend, 2001; Viola, 2006), improve academic performance (Blair, 2009; Viola, 2006), expand learners' attitudes toward vegetable consumption, and bring about a willingness to eat new and unfamiliar vegetables (Block et al., 2012; Robinson-O'Brien, Story & Heim, 2009). Learners can, as a result, develop literacy skills, which may in turn build their self-esteem (The National Gardening Association, 2000). School-based vegetable gardens can enrich school subjects, provide sensory interaction, and bring learners into closer contact with nature (Thorp & Townsend, 2001). On a broader level, school-based vegetable gardens can improve the physical and social environment of a school (Viola, 2006; Blair, 2009) and cultivate an enhanced environmental attitude amongst learners, as they develop pride in the gardens they create (The National Gardening Association, 2000).

The sustainability of school-based vegetable gardens, however, remains a matter of concern, as many school-based vegetable gardens are not sustained (Goodwin, 2008; Ozer, 2007). Various challenges may be experienced such as limited resources, time, funding, and space (Somerset, Ball, Flett & Geissman, 2005), unfavourable weather conditions, pests, inadequate fencing and experience, poor quality seedlings and soil, as well as theft (Ozer, 2007; Viola, 2006; Graham, Beall, Lussier, McLaughlin & Zidenberg-Cherr, 2005; Goodwin, 2008; Faber & Laurie, 2011; Aliber & Hart, 2010; Mabusela, 1999). Despite research indicating that adequate knowledge, resources, skills, support and passion (FAO, 2014; Goodwin, 2008; Viola, 2006) may have a positive effect on the sustainability of school-based vegetable gardens, the need for on-going research in this field is evident.

1.2 PURPOSE OF THE STUDY

Against this background, the purpose of the current study was to explore and describe (Marshall & Rossman, 2011; Mouton, 2001) the perceptions of key role-players regarding best practices associated with sustainable school-based vegetable gardens. Research on school-based vegetable gardens (Block et al., 2012; Morris & Zidenberg-Cherr, 2002; Robinson-O'Brien et al., 2009) often focuses on the benefits and value thereof, emphasising learning enrichment and the improvement of learners' nutritional

knowledge. Viola (2006), however, highlights the need for ongoing research on the sustainability of school-based vegetable garden projects, as well as the importance of identifying barriers that may inhibit the sustainability of such gardens.

Blair (2009) suggests that in order to enhance school-based vegetable garden research, studies need to focus on creative ways of maintaining vegetable gardens over time. Ozer (2007) adds that ongoing research is required to identify best practices and processes associated with long-term sustainability of vegetable gardens. As a descriptive study (Mouton, 2001), this inquiry aimed to describe such best practices as perceived by key role-players involved in school-based vegetable gardens.

1.3 RESEARCH QUESTIONS

The following primary research question guided the current study:
What are the perceptions of key role-players on best practices for sustainable school-based vegetable gardens?

In order to address the primary research question, the following secondary research questions were explored:

- How is a sustainable school-based vegetable garden conceptualised?
- Which resources may promote a sustainable school-based vegetable garden?
- Which challenges may inhibit the sustainability of a school-based vegetable garden?

1.4 WORKING ASSUMPTIONS

Based on my initial literature review, I assumed the following in undertaking this study:

- School-based vegetable gardens can support Nutrition Education, improve learners' attitudes about environmental sustainability, increase learners' social interactions with peers and adults and develop their viewpoints about healthy eating habits.
- School-based vegetable gardens imply strong community building components and can promote teamwork, as well as interaction between the various role-players.
- Schools situated in resource-constrained communities face specific obstacles to sustaining school-based vegetable gardens, such as theft by community members, limited water availability, vandalism, and deteriorating security and fencing.

- Many teachers, who are key role-players in school-based vegetable garden projects, are not agriculturally literate, and they require knowledge of basic plant science and plant-growing skills.

1.5 CONCEPT CLARIFICATION

In the following section, I clarify the operational concepts of the study.

1.5.1 PERCEPTIONS

According to Sigmund (1962), perception focuses on that which constitutes input and has consequences to an individual. Perception thus refers to a conscious sensory experience (Goldstein, 2010), which implies the process of attaining awareness or understanding of one's surrounding environment. This awareness is obtained by organising, identifying and interpreting information in order to understand the environment (Schacter, 2011; Reber, Reber & Allen, 2009). Reisinger and Turner (2003) meanwhile note that perception is about assigning meaning to an object.

According to Mareno (2013, p. 35), perception can be seen as "the construction of mental symbols or representations of reality gained from the senses". Perception allows individuals or groups to understand their social worlds (Merriam Webster, 2015). Closely related, the Longman Dictionary of Contemporary English (2005) defines perception as the way a person thinks about something and builds an idea of what it is like. Perception, in basic terms, therefore, refers to the way in which people see the world around them (Reisinger & Turner, 2003).

1.5.2 KEY ROLE-PLAYERS

According to the Collins English Dictionary (n.d.) key role-players refer to individuals who are important in a particular activity or field. In this study, key role-players included school principals, teachers, and community members involved in school-based vegetable gardens.

A principal can be defined as someone who is in charge of a school (Merriam- Webster, 2015; Longman Dictionary of Contemporary English, 2005) and is regarded as a senior person in an organisation or group (Soanes & Stevenson, 2008). In this study, the principal is referred to as an educator acting or appointed as head of the school, responsible for the overall functioning of the school and regarded as one of the key role-players.

Strauss and Ziv (2012), as well as Wallace (2008) describe a teacher as a professional person who acts intentionally to increase the knowledge of others in the setting of a school or other educational institution. According to Goodwin (2008), teachers are often regarded as the driving force of a school-based vegetable garden and need adequate training in order to effectively sustain a vegetable garden. For the purpose of this study, a teacher is regarded as a key role-player in terms of sustaining a school-based vegetable garden.

Community members refer to key role-players that reside in the community where the selected school-based vegetable gardens are situated. According to Ferreira and Ebersöhn (2012, p. 48) the term community members implies "a group of people or families living […] under common laws, having certain things in common and being made up of individuals who rely on one another to help satisfy their needs and live according to certain norms, rules or common policies."

1.5.3 BEST PRACTICES

Jarrar and Zairi (2000) describe best practices as systematic methods or procedures, which can be considered as exemplary, or successfully demonstrated. Similarly, Hargreaves and Fullan (2012) describe best practices as existing routines that enjoy broad consensus over their high level of efficacy.

In the current study, best practices refer to those practices that key role-players perceive as crucial in maintaining sustainable school-based vegetable gardens. These may relate to practices that have been tried and tested, and have proven to be successful in enhancing sustainability.

1.5.4 SUSTAINABLE SCHOOL-BASED VEGETABLE GARDENS

According to the United Nations (2010), school-based vegetable gardens are cultivated areas around or near to schools, tended to at least in part by learners. These school-based vegetable gardens may produce both vegetables and fruit, and related activities may include small-scale animal farming, fishery, beekeeping, ornamental plants and shading, as well as small-scale staple food production (United Nations, 2010). School-based vegetable gardens are also used for education purposes and related learning activities, as well as community gardens (Bureau of Planning and Sustainability, 2011). In this study, school-based vegetable gardens will refer to vegetable gardens that are situated at schools, and managed by the key role-players in the five participating schools.

Sanders and McCormick (1993) view sustainability as the ability to maintain a task or project over a prolonged period of time. Sustainability can also be described as the capacity to endure through time and maintain certain functions into the future (Pollock & Whitelaw, 2005). According to Tivy and O'Hare (1982), sustainability can be seen as the manner in which a resource is managed to ensure that there is continuous production of stock and repeated incoming resources. In summary, Conway (1985) states that sustainability entails a system that is able to, despite disturbances, maintain its pace of production. For the purpose of this study, sustainable school-based vegetable gardens refer to gardens that are able to endure over time in such a manner that crops are produced every year.

1.6 THEORETICAL FRAMEWORK

This study is situated within the social ecological model (Bronfenbrenner, 1979)[4] and formulated from the perspective of positive psychology (Seligman & Csikszentmihalyi, 2000). Positive psychology focuses on aspects that allow individuals to prosper, develop themselves, improve their experience of life, and ultimately live significant lives (Seligman & Csikszentmihalyi, 2000). The strengths and resources that people possess will ultimately enable them to sustain a project, such as a successful school-based vegetable garden.

Bronfenbrenner's (1979) social ecological model highlights the interaction that takes place between a person and the environment. As a result of this interaction, certain behaviour will occur, which can further influence the interaction between an individual and its context (Duncan, Bowman, Naidoo & Roos, 2007). School-based vegetable gardens can be regarded as products of the interaction between individuals and their environments, where individuals use physical resources to grow vegetables. Such interaction does not take place in isolation, and various aspects may have an effect on these relationships (Trickett, 1996).

Many schools (FAO, 2014; Ozer, 2007) possess the necessary resources and skills to maintain successful and sustainable school-based vegetable gardens, but fail to do so because of internal or external factors, such as a lack of knowledge or unfavourable weather conditions (FAO, 2014; Goodwin, 2008). In these cases, the relationships between people and their environments are compromised (Bronfenbrenner, 1979),

[4] I include this dated source, as it is an original source on the social ecological model (Bronfenbrenner, 1979).

preventing them from accessing the necessary strength and resources in order to sufficiently interact with the school-based vegetable garden (Seligman & Csikszentmihalyi, 2000). I discuss my selected theoretical framework in more detail in Chapter 3.

1.7 PARADIGMATIC APPROACHES

In the following section, I briefly introduce the epistemological and methodological approaches that guided the current study. Detailed discussions of these choices will follow in Chapter 3.

1.7.1 EPISTEMOLOGICAL APPROACH: INTERPRETIVISM

I relied on Interpretivism (Ponterotto, 2005; Rubin & Babbie, 2014) as epistemological approach. In the current study, I aimed to explore and describe people's perceptions concerning best practices on sustainable school-based vegetable gardens, based on their experiences. Interpretivism allowed me to focus on this topic as viewed by the participants (Schwandt, 2000), thereby gaining an in-depth understanding in terms of the personal worlds of the participants (Terre Blanche & Durrheim, 2002).

Interpretivism may lead to possible researcher bias (Ponterotto, 2005), which may influence the trustworthiness of the results and potentially provide a skewed representation of the actual situation. In guarding against this possibility, I engaged in reflexive discussions with my supervisors throughout the research process (Ponterotto, 2005). By incorporating a research diary (Ortlipp, 2008), I further documented my personal views and perceptions, in order to ensure that I remained focused on the phenomenon as seen from the participants' points of view and not my own (Schwandt, 2000).

1.7.2 METHODOLOGICAL APPROACH: QUALITATIVE RESEARCH

I followed a qualitative approach (Creswell, 2013) in order to understand a specific social phenomenon, as perceived by human beings. Byrne (2001, p. 372) emphasises that qualitative research is "contextually laden, subjective and richly detailed", making it a suitable choice for this study. Throughout, I was required to provide detailed explanations and interpretations of data, in order to produce meaning, concerning participant perceptions regarding sustainable school-based vegetable gardens. As qualitative studies incorporate everyday language and participants' own words to describe events, experiences or a phenomenon (Taylor & Bogdan, 1998), I was able to describe and answer questions about the participants' experiences in a rich manner.

A qualitative approach thus allowed me to explore the perceptions, attitudes, knowledge and skills of the participants pertaining to best practices for sustainable school-based vegetable gardens.

In order to ensure that this study was both time and cost-effective (Creswell, 2013; Silverman, 2016), I compiled a time-line and worked according to a specified budget. Another potential challenge was that the outcome of the research could have been dependent on my skills as researcher (Creswell, 2013). To this end, I familiarised myself with the selected data generation strategies before commencing with field work in an attempt to enhance trustworthiness.

1.8 RESEARCH METHODOLOGY

In this section I provide an overview of the selected methodological strategies. A more detailed discussion follows in Chapter 3.

1.8.1 RESEARCH DESIGN

I utilised an instrumental case study design (Yin, 2003), employing Participatory Reflection and Action (PRA) principles (Chambers, 2003). A case study design is used when unsystematic inquiry is undertaken into an event to describe and explain a present-day phenomenon within a real-life context, whilst using multiple sources of evidence (Bhana, 2006; Yin, 2003). Case studies utilising an interpretivist perspective therefore strive to obtain a comprehensive and holistic understanding of participants' perceptions within a particular context, in order to gain insight into how participants make meaning of the phenomenon under study (Nieuwenhuis, 2007a). In support PRA-based principles aim to gain insight into the meanings represented by participants (Chambers, 2003), and to generate knowledge within the context of an active partnership, in order to improve the social, educational and material environment where the research takes place (Bhana, 2006).

An advantage of case study designs employing PRA principles is the use of multiple data sources and data generation techniques (Nieuwenhuis, 2007b), which contribute to triangulation (McMillian & Schumacher, 2014). Even though such a design has limitations in terms of generalisation value (Nieuwenhuis, 2007a), the purpose of this study was not to generate generalisable findings, but to rather gain insight and an in-depth understanding into the dynamics of the phenomenon under study (Yin, 2003). Throughout, I strove to make sure that every participant felt heard and understood during the data generation process. PRA principles also allowed for a raised

awareness amongst the participants regarding their own abilities and existing resources that potentially mobilised them towards social action (Bhana, 2006; Chacko, 2013; Yin, 2003).

1.8.2 SELECTION OF RESEARCH SITE AND PARTICIPANTS

In this study, I relied on convenience sampling (Laher & Botha, 2012) in selecting five primary schools situated in resource-constrained communities in the Nelson Mandela Metropole, Eastern Cape Province. All five of these schools have been participating in the broader STAR and SHEBA projects since 2003. As such, these schools were "readily available" (Mertens, 1998, p. 265) and easily accessible (Terre Blanche & Durrheim, 2002). Even though convenience sampling implies the potential limitation, that results may not be generalised (McMillan & Schumacher, 2014), the aim of this study was to gain an in-depth understanding of the perceptions of key role-players regarding best practices on sustainable school-based vegetable gardens in specific schools, and not to generalise the findings I obtained.

After identifying the five schools, I purposefully selected (Maree & Pietersen, 2007) fourty-eight teachers, parents and community volunteers (n=48) to participate in data generation activities. Purposeful sampling occurs when participants are selected based on specific defining characteristics relevant to the formulated research questions (Maree & Pietersen, 2007). The selection criteria relevant to this study include that participants had to be active role-players and involved in school-based vegetable gardens at their specific schools, older than 18, able to speak English, and willing to participate voluntarily.

1.8.3 DATA GENERATION AND DOCUMENTATION

I utilised PRA-based workshops, observation, audio-visual techniques, field notes, a research diary, and a semi-structured interviews as data generation and documentation techniques (McMillian & Schumacher, 2014). I undertook two field visits (August and October 2015), with the second visit serving the purpose of member checking (Lincoln & Guba, 1985). During the PRA-based workshops, data was generated through small group discussions at each school. Towards this end, five to six participants contributed to small group discussions after being prompted by specific questions, and then presented their ideas to the bigger group. Throughout, I also made use of observation, which, according to Nieuwenhuis (2007a), is an essential data generation technique in qualitative studies that can provide an insider perspective on group dynamics and behaviours, thereby allowing the researcher to experience reality

as the participants do. In further support, field notes allowed me to record the participants' general behaviour and events as they occurred during the study (McMillan & Schumacher, 2014). Throughout the research, I fulfilled the role of non-participant observer and regarded myself as an outsider aiming to gain an insider view (Chambers, 2003).

In addition to field notes, all PRA-based discussions were audio-recorded. Audio-recordings can capture different perceptions and provide cross-checks for data (Kelly, 2006). For the purpose of validation and documentation, photographs were taken, thereby creating a visual record (McMillan & Schumacher, 2014). In addition, posters were compiled by the small groups, as part of the PRA-based activities, providing additional visual data that contributed to my understanding of the central phenomenon under investigation (McMillan & Schumacher, 2014; Creswell, 2013). I also reflected on my assumptions and thoughts using a research diary (Ortlipp, 2008). Personal reflexivity (Creswell, 2013) allowed me to capture my own personal expectations, personal belief system and possible subjectivities. Reflexivity furthermore assisted me to obtain methodological rigour and trustworthiness (Lincoln & Guba, 1994). I elaborate on the data generation and documentation strategies in Chapter 3.

1.8.4 DATA ANALYSIS AND INTERPRETATION

Thematic analysis entails the identification, analysis and reporting of themes in order to organise and describe data in a rich and detailed manner, so that it can be interpreted (Braun & Clarke, 2006; Boyatzis, 1998). The purpose of qualitative data analysis is to identify multiple realities present in data (Maree & Van der Westhuizen, 2007), as well as to analyse and report patterns, together with themes that emerge within generated data (Braun & Clarke, 2006).

During the process of inductive analysis, I followed the steps proposed by Braun and Clarke (2006), which included familiarising myself with the data by transcribing the PRA-based discussions and semi-structured interviews, and viewing and re-viewing the transcriptions and visual data. Secondly, I generated initial codes, wherafter I searched for and identified potential themes. Next, I reviewed the themes and sub-themes, and named each of these.

The aim of this inductive thematic analysis process was to code the data without trying to fit it into a pre-existing coding frame (Braun & Clarke, 2006). I aimed to thoroughly investigate the data set and to identify general themes before drawing conclusions

(McMillan & Schumacher, 2014). This process enabled me to establish final themes related to prominent issues that arose in terms of lessons learned and the sustainability of school-based vegetable gardens (Creswell, 2013). A detailed discussion of the thematic analysis follows in Chapter 3.

1.9 ETHICAL CONSIDERATIONS

Beauchamp and Childress (2011) provide guidelines for ethical practice when conducting qualitative research. I considered these guidelines to be a background to the ethical stipulations of the Ethics Committee of the Faculty of Education at the University of Pretoria (University of Pretoria, 2017). Prior to the commencement of the study, I applied for ethical clearance, which essentially formed part of the clearance obtained for the broader research project. Before conducting any fieldwork or research, permission was obtained from the Eastern Cape Department of Education [See Appendix A], where permission was also obtained for the larger research project.

Throughout the study, I adhered to the ethical guidelines of autonomy and respect for the dignity of participants by obtaining voluntary written consent, informing participants about the relevant detail of the study, and by honouring confidentiality (Macklin, 2002). I also refrained from practicing malfeasance, by not causing harm or creating deception during the study (Beauchamp & Childress, 2011). Additionally, I aimed to adhere to beneficence and justice, by ensuring fair treatment of all the participants (Wassenaar, 2006). I set out to report the research findings in a balanced manner (Beauchamp & Childress, 2011). Finally, I dealt with all recorded data (written and audio recorded) in a confidential manner and respected anonymity by using pseudonyms when reporting the results.

1.10 QUALITY CRITERIA

In an attempt to enhance trustworthiness and rigour, I aimed to adhere to the quality criteria of credibility, transferability, confirmability, dependability and authenticity (Lincoln & Guba, 1985). Credibility can be described as the accurate presentation of a particular context (Mays & Pope, 2000) by applying triangulation to data generation and analysis in an attempt to locate any possible discrepancies in the findings (Creswell, 2013). In addition to utilising a range of data generation and documentation strategies, field notes, a research diary, together with regular peer debriefing, contributed to quality control (Ary, Jacobs, Rasavieh & Sorensen, 2013; Mouton, 2001; Merriam, 1998). Transferability is defined as the manner in which a reader is able to

take the findings of a study and transfer them to other contexts (Lincoln & Guba, 1985). As previously mentioned, the aim of the current study was not to generalise, but to achieve transferability by providing rich descriptions of participants' perceptions. Detailed descriptions of the research content and process may assist the reader in determining the extent to which the findings of the study may be transferred to similar contexts.

Dependability refers to whether or not the same findings would emerge if a study were to be repeated (Lincoln & Guba, 1985; Babbie & Mouton, 2001). In order to ensure that I produce dependable results, I kept an audit trail of the data generation and documentation procedures (Merriam, 1998) and engaged in continuous reflection on the research. Furthermore, I undertook regular discussions with my supervisor, whose oversight further contributed to the dependability of the study.

Confirmability implies limited influence of researcher bias on the findings of a study (Lincoln & Guba, 1985). As such, confirmable findings indicate that the data and interpretations can be related to the sources, and are not fabrications of the researcher (Creswell, 2013). The confirmability of this study was enhanced by multiple data sources and data generation techniques. Finally, authenticity refers to the degree to which different points of view are fairly and equally represented (Lincoln & Guba, 1985). To this end, I included a range of different perspectives (realities) and contributions, as obtained during the study (Lincoln & Guba, 1985; Merriam, 1998). In addition, I did member checking at all the schools during the filed visit (Denzin & Lincoln, 2005).

1.11 OUTLINE OF THE CHAPTERS

CHAPTER 1: INTRODUCTION AND GENERAL ORIENTATION

Chapter 1 has provided an introduction to the study. In it, I stated the research purpose and questions, and clarified the various concepts guiding the investigation. I discussed the rationale of the study and provided an outline of the paradigmatic perspectives, research design and research methodology I employed. Lastly, I introduced the ethical considerations and quality criteria to which I adhered.

CHAPTER 2: LITERATURE REVIEW

In Chapter 2, I reviewed existing literature related to the study focus. I discuss the current global food and nutritional situation, as well as the current national food and nutrition situation. Hereafter, I discuss school-based vegetable gardens in terms of

their potential benefit and the process of setting up and running a school-based vegetable garden. I also describe the importance of and progress towards the sustainable developmental goals (SDGs), explore garden-based education, and discuss challenges related to sustainable school-based vegetable gardens. I conclude the chapter with a discussion of Bronfenbrenner's social ecological model, situated within positive psychology, which formed the theoretical underpinning of the study.

CHAPTER 3: RESEARCH METHODOLOGY

In Chapter 3, I describe the research process. I elaborate on the selected epistemological paradigm (Interpretivism) and methodological approach (qualitative research). I discuss the research design, selection of participants, data generation and documentation strategies, and elaborate on the data analysis and interpretation I completed. I conclude the chapter with discussions on quality criteria, the role I took as researcher, and relevant ethical considerations.

CHAPTER 4: RESULTS AND RESEARCH FINDINGS

In Chapter 4 I present the results and findings of the study, in relation to significant literature. I present the results in terms of the themes and sub-themes I identified, and then interpret these by relating them to existing theory.

CHAPTER 5: CONCLUSIONS AND RECOMMENDATIONS

In Chapter 5, the concluding chapter, I provide an overview of the previous chapters, and then come to conclusions in terms of the research questions formulated in chapter 1. I present the potential contributions of the study, and reflect on the challenges I faced. I conclude the chapter with recommendations for training, as well as further research and practice.

1.12 CONCLUSION

Chapter 1 provided an introduction, some background for and the rationale of the study. I stated the research questions and motivated my decision for focusing on this specific field. I clarified the key concepts of the research, and introduced the selected epistemological and methodological paradigms, research design, participant selection and data generation and interpretation strategies. I briefly referred to quality criteria and ethical issues relating to the study. Finally, I provided an outline of the chapters of the mini-dissertation.

In Chapter 2, I discuss existing literature that relate to the focus of this study. I also explore the selected theoretical framework, which follows after the social ecological

model of Bronfenbrenner (1979), with positive psychology theory (Seligman & Csikszentmihalyi, 2000) as overarching ethos.

CHAPTER 2

LITERATURE REVIEW

2.1 INTRODUCTION

Chapter 1 provided an overview of the study. I presented the rationale and purpose of the study, formulated research questions and stated my working assumptions, clarified key concepts, and briefly described the theoretical framework that guided this study. Lastly, I presented an overview of the selected paradigmatic approaches, research methodology, quality criteria, and ethical considerations that apply to the study.

In this chapter I explore existing literature related to the study focus. I examine the current global and national food and nutritional situation, and shed light on current responses to the challenges of hunger and malnutrition. Furthermore I provide an overview of existing literature concerning the benefits, requirements and challenges related to sustainable school-based vegetable gardens. I also explain the theoretical framework in more detail, discussing the social ecological model of Bronfenbrenner (1979) against the background of positive psychology (Seligman & Csikszentmihalyi, 2000) as an overarching ethos.

2.2 OVERVIEW OF CURRENT GLOBAL FOOD AND NUTRITION SCENARIO

Currently, enough food is produced to feed the world (Chicago Council on Global Affairs, 2011), but according to the World Food Programme (2011), around 66 million primary school learners attend school hungry on a daily basis. It is estimated that approximately 23 million of these primary school learners reside in Sub-Saharan Africa (WFP, 2011). Rapid urbanisation in developing countries, as well as a demanding economic climate have led to an increase in food prices, causing individuals to spend between 50% and 80% of their total income on food, with families often buying products of diminished micronutrient value (Bouis, Eozenou & Rahman, 2011; Brinkman, De Pee, Sanogo, Subran & Bloem, 2010).

The prevalence of household food and nutrition insecurity has consequently led to many families following a monotonous diet, with inadequate dietary diversity, which often results in malnutrition (Kennedy, 2009; Afari-Sefa, Tenkouano, Ojiewo, Keatinge & Hughes, 2012); Thompson & Meerman, 2013). Globally, approximately 794 million individuals suffer from malnutrition, which is an alarming number, despite the fact that this prevalence has dropped with 216 million individuals since 1990 (FAO, 2015). Progress towards further decline is, however, hindered by continued limited economic

growth and political instability in developing countries, such as those in Sub-Saharan Africa (FAO, 2015).

2.2.1 GLOBAL CHALLENGE OF HUNGER AND MALNUTRITION

In many countries across the world, the daily nutritional needs of both adults and learners are not met in terms of fruit and vegetable intake (Kristjansdottir et al., 2006; Larson, Neumark-Sztainer, Hannan & Story, 2007). Rapid urbanisation has had the effect that learners consume less fresh fruit and vegetables and more fast food, which is energy-dense, processed, elevated in saturated fat and high in refined carbohydrates (Joint WHO/FAO Expert Consultation, 2002). These changes to dietary decisions, joined by decreased physical activity and increased tobacco use, has led to a decline in the health of individuals due to the increase of diet-related chronic diseases, obesity and malnutrition (Popkin, 1999; Blair, 2009; Cameron et al., 2003; Somerset et al., 2005).

According to the FAO (2015:49), hunger is measured as “the probability that a randomly selected individual from the reference population is found to consume less than his/her calorie requirement for an active and healthy life”. ‘Hidden hunger’ is a term which refers to micronutrient deprivation, a condition that affects one third of the global population (Kennedy, 2009; Ahlbom & Norell, 1990). The nutrients that are important for healthy development and will prevent micronutrient deprivation, includes vitamin A, iron, iodine, zinc, calcium, folic acid and vitamin D (Torheim et al., 2003). Deficiency in one or more of these nutrients can lead to blindness, brain damage, a compromised immune system (World Food Programme, 2009; Gibson & Ferguson, 2008), high rates of mortality (Pelletier, Frongillo, Schroeder & Habicht, 1995) and various diseases, such as diarrhea and respiratory infections, because of inhibited absorptions of nutrients, decreased appetite and unresponsiveness to medical treatment (Ivers & Cullen, 2011; Jackson, Ashworth & Khanum, 2006). According to Ahlbom and Norell (1990), as well as Torheim et al. (2003), most individuals facing such conditions have multiple deficiencies, rather than a deficiency in only one vitamin or nutrient.

Inadequate food consumption practices often times result in malnutrition (Labadarios, Steyn, Maunder, MacIntyre & Swart, 2001). In terms of food security, many South African households lack nutrient security (Hendriks, 2014). As mentioned, this phenomenon is known as hidden hunger, where individuals have micronutrient deficiencies (Steyn, Nel, Nantel, Kennedy & Labaradorios, 2005; Hendriks, 2014). A

diet that is adequate in both quantity and quality is a prerequisite for wellbeing and, if these requirements are not met, an individual will experience malnutrition (Steyn, 2006).

Nutritional deprivation during a child's developmental years will have long-lasting, damaging consequences on a learner's cognitive and physical development (Agüero, Carter & Woolard, 2006). In this regard, research indicates a clear link between poverty and stunted growth, as well as underweight learners, as is often seen in South Africa, especially in rural areas. As many as 26.5% of these learners will experience stunted growth, compared to 16.7% of learners from better resourced, often urban areas (Labadarios et al., 2001).

Hidden hunger does not always reflect in physical symptoms, but can also have a lasting impact on certain areas of a learner's development. This can include the mental development of a learner (Jamieson, Nock & Mendes, 2012; Gelli, 2010), causing distractibility, energy depletion and deficits in concentration and productivity, which can, in extreme cases, even pose a threat to a learner's educational opportunities (Faber & Wenhold, 2007; Richter, Rose & Griesel, 1997; Brinkman et al., 2010), as learners who are malnourished will often underperform in school, attend school on an irregular basis, and may not complete school (Faber & Wenhold, 2007; Bennett, 2003). At an even younger age, research shows cognitive ability in pre-school years to be predictive of secondary school enrollment and achievement in high school (Gorman & Pollit, 1996). It follows that hunger and malnutrition in the pre-school years will determine performance in later life (Victora et al., 2008).

2.2.2 FOOD AND NUTRITION SECURITY IN SOUTH AFRICA

At the World Food Summit conducted in 1996 (FAO, 2010:8), food security was defined as a moment in which "all people, at all times, have physical and economic access to sufficient, safe, and nutritious food to meet their dietary needs and food preference for an active and healthy life" (FAO, 2010:8). Food security implies the availability of food resources, access to food resources, adequate consumption of food, and appropriate use of food in a nutritious manner (Hussein, 2002). In this regard, Hussein (2002) furthermore states that these four elements all need to be present for food security assurance.

According to Thornton, Leibbrandt and Ardington (2016), South Africa is food secure at a national level, even though widespread food insecurity exists at household level.

Many South Africans residing in resource-constrained communities are plagued by intense poverty, inequality and food insecurity (Dimova, 2015), perpetuated by the associated food-consumption practices. South Africa is regarded as one of 36 high-burden countries, with a notable number of learners showing stunted growth (Nishida, Shrimpton & Darnton-Hill, 2009). In addition, South Africa faces the challenge of people struggling with both over-nutrition and under-nutrition in one population, which is generally caused by poor diet and food insecurity (Shisana et al., 2013).

Despite claims of food security, Hendriks (2005; 2014) however elaborates on the inconsistency of existing research on food security in South Africa. Such inconsistency can be seen in the reports of two different sources, where the National Food Consumption Survey (NFCS) reported in 2005 that around 52% of households experienced hunger, compared to the General Household Survey (GHS), reporting that 10% of adults and 12% of learners in South Africa are hungry. Oxfam (2014) recently reported that one in every four South African citizens suffer from hunger on a daily basis, and Hall and Wright (2010) state that in 2010, two-thirds of South African learners lived below the poverty line. Hendriks (2014) reports that in 2012, over a quarter of households in South Africa, experienced hunger, and a further 28.3% were at risk of hunger.

In South Africa, the cost of a simple basket of food increased from around R485 to R514 between January 2014 and January 2015 (Food price monitor, 2015). This increase represents a surge from 45.3% to 48.0% for the poorest 30% of the country's population (Food price monitor, 2015). Thornton (2008) reports that food security in urban, as well as rural households, are heavily dependent on cash incomes in order to purchase food for consumption. According to Statistics South Africa (2008), South African income is amongst the most unequal in the world, where the wealthiest 10% of the population are in a position where they earn more than 50% of the total available household income, while the poorest 40% obtain less than 7% thereof. In comparison to other middle-income countries, South Africa appears to have extreme levels of absolute poverty (Altman, Hart & Jacobs, 2009), resulting in many households struggling to attain food security, and many suffering from daily hunger and malnutrition (Hendriks, 2014).

In the South African context, many individuals furthermore form part of resource constrained communities, troubled by high levels of preventable illnesses that can once again be related to poor diet and low nutritional consumption (Luruli,

Netshandama & Francis, 2016). In spite of numerous national nutrition-focused interventions employed in South Africa, including the Integrated Nutrition Programme, recent findings still indicate an increase in adult and child malnutrition rates, caused by inadequate dietary intake and food insecurity (Steyn, Bradshaw, Norman & Joubert, 2006; Labadarios, Davids, Mchiza & Weir-Smith, 2009). Some households even show the co-existence of malnutrition and obesity (Bradshaw et al., 2006), both usually caused by a carbohydrate-based, low-quality staple food diet, lacking in adequate nutrients (Faber & Wenhold, 2007). Research (Statistics South Africa, 2013; WHO, 1998) furthermore indicates an emerging pattern of malnutrition in resource-constrained communities, with under-nutrition normally found amongst children and obesity amongst adults, more specifically in women (Popkin & Doak, 1998; United Nations, 2013; WHO, 1998).

2.2.3 FOOD CONSUMPTION PRACTICES IN RESOURCE-CONSTRAINED COMMUNITIES IN SOUTH AFRICA

Rapid urbanisation has resulted in a decline in 'green space' and nutrition transition, as people changed their views on growing their own food (Broadway & Broadway, 2011). Previously, it was common for rural households to produce their own food, while urban households tended to purchase food (Baipethi & Jacobs, 2009). Recent studies, however, indicate an increase of food purchases by both urban and rural households to such an extent that households now purchase almost 90% of their food supplies (Baipethi & Jacobs, 2009), causing families to spend a great deal of their income on food (Baipethi & Jacobs, 2009). Current conceptions on food reveal that individuals view the consumption of traditional food as associated with poverty, and as a result, those who have moved to urban areas may now live on a diet made up of high levels of fat and refined carbohydrates (Bourne, Lambert & Steyn, 2002).

Research furthermore indicates that half of the households in South Africa spend less than R800[5] on food per month, with an average household of five people spending R5.33 per person per day on food (Jacobs, Aliber & Oyelana, 2016). As many individuals live in poverty, the price of food is often the main driving force when buying food (Shisana et al., 2013). Lower nutritional diversity and a lower living standard measure (LSM) are often times related, as the poor do not necessarily have adequate access to a variety of food products (Aggarwal, Monsivais & Drewnowski, 2012) and

[5] Approximately $65.

may, as a result, resort to cheaper refined foods, lacking the spectrum of nutrients required for health (Ochieng et al., 2016). Results from the National Health and Nutrition Examination Survey (NHANES) performed in the United States (Rehm, Monsivais & Drewnowski, 2011), indicate that a diet made up of legumes, vegetables and fruit is normally associated with increased costs of food. Similarly, results from the Seattle Obesity Study (Aggarwal et al., 2012) show that foods that are high in nutrients, which combat chronic diseases, are more expensive than a diet that is low in nutrients, with a higher disease risk.

Simply put, healthy food is generally more expensive and to most South Africans, a healthy diet is unaffordable (Aggarwal et al., 2012; Jacobs et al., 2016). In contrast to buying food from stores, street vendors often sell fast food for lower prices, making it more accessible and affordable to those who have a lower income (Feeley, Musenge, Pettifor & Norris, 2012). According to Darmon and Drewnoski (2015), food that are high in fats and oils, that have added sugar, and are made of refined grains have lower energy content, while foods with low energy-density, such as fruits, and vegetables, lean meat and fish, have a higher energy content. Consumption of fruit and vegetables in South Africa, is, however, generally low (Labadarios et al., 2001), with only 196 grams of fruit and vegetables being consumed per person per day, which points to limited availability of a variety of foods (Rose, Bourne & Bradshaw, 2002). This measurement amounts to about half of the daily recommendation for fruit and vegetables (400g) as set out by the World Health Organisation (WHO, 1990).

As indicated, individuals from lower-income households generally consume diets made up of low dietary variety and will rely on staple food, high in carbohydrates, with limited portions of animal products, as well as fruit and vegetables (Ochieng et al., 2016; Ruel, Minot & Smith, 2005; Labadarios et al., 2009). Steyn (2006) states that women from resource-constrained communities often consume a diet made up of carbohydrates, plant protein, fiber and magnesium. Such a diet lacks the necessary nutrients, especially when compared to a diet of urban women, who will usually consume more diversified meals (Institute of Medicine [IOM], 2002). A typical diet for a South African individual, residing in a resource-constrained community may thus include food items such as the following: corn, maize, beans, milk, meat, wild greens, potato, or pumpkin (Taylor & Jinabhai, 2001). According to Martins (2005), the largest part of household income reserved for food in resource-constrained communities is typically spent on poultry, maize (50% of the budget), and brown bread.

2.3 GLOBAL RESPONSES TO HUNGER AND MALNUTRITION

With hunger and malnutrition affecting so many people on a global scale, it is important to consider global responses to address this dilemma (World Food Programme, 2009). Globally, countries employ different techniques in an attempt to decrease hunger and malnutrition, such as trying to maintain positive economic growth, maintaining consistent agricultural production, drafting and implementing social protection policies, developing specialised programmes for vulnerable citizens, engaging in small-scale farming, and implementing food security intervention projects such as school-based feeding schemes (FAO, 2015).

2.3.1 ADDRESSING THE WORLD HUNGER CRISIS

The escalating numbers of both obesity and malnutrition has created an increased need for small-scale vegetable gardening projects to be started (FAO, 2015; Hedley et al., 2004). The production of vegetables at home may lead to an increase in dietary diversity (Ochieng et al., 2016), and support vulnerable families in attempting to reduce malnutrition and other health-related challenges (Ochieng et al., 2016). According to Armstrong (2000) and the FAO (2015), home-based vegetable gardens can improve the nutritional status of vulnerable families, and also bring about enhanced levels of physical activity.

Different countries around the world have started to look for solutions for the crisis concerning malnutrition. A global initiative, the Scaling Up Nutrition (SUN) movement (Nabarro, 2010) for example, emphasises nutrition-related interventions and nutrition-sensitive developments, with the aim of improving overall global nutrition in 35 countries (Nabarro, 2010). Since the commencement of the movement, numerous countries have managed to put multi-faceted policies in place in order to mobilise national resources to reduce malnutrition and hunger (Nabarro, 2010).

During the 2000 Millennium Conference (United Nations, 2013), the Millennium Development Goals (MDGs) were established (FAO, 2015). Following the establishment of the MDGs, the United Nations Rio+20 summit was held in Brazil in 2012. During the Summit, the United Nations called upon governments to generate a set of Sustainable Development Goals (SDGs) that could be assimilated as follow-up of the MDGs, following the 2015 target. During this conference, the commitment to liberating humanity from poverty and hunger (United Nations Department of Social and Economic Affairs, 2015), was restated by setting goals that can support nations to fight

poverty, inequality, hunger, limited protection, and inadequate education (United Nations, 2010; 2013).

Building on the content of the MDGs, the SDGs argue poverty eradication to be the greatest global challenge the earth currently faces (United Nations Department of Social and Economic Affairs, 2015). The objectives and requirements for the SDGs thus include poverty eradication, establishment of sustainable patterns of consumption, and the protection and management of a natural resource base (United Nations Department of Social and Economic Affairs, 2015). School-based vegetable gardens can be considered a form of intervention in supporting community development within the context of poverty, as sustainable school-based vegetable gardens may potentially address the challenges associated with poverty and hunger.

More specifically, school-based vegetable gardening implies the possibility of teaching learners to grow their own vegetables. This skill may in turn be transferred to parents and other community members (UNDSEA, 2015), thereby enabling community members to generate an income (addressing SDG 1) by selling vegetables, and in some cases equipping people with gardening skills that may support them to secure employment on farms (UNDSEA, 2015; Somerset et al., 2005). In terms of the second SDG goal, ending hunger, school-based vegetable gardens may potentially provide a sustainable source of food and improve learner's nutritional knowledge by teaching them to try new food types and make healthier choices in what they eat. In this manner, food security can be promoted as well as healthy nutrition, and the promotion of sustainable agriculture (Blair, Giesecke & Sherman, 1991; Armstrong, 2001; Lee, Howard & Fowler, 2002; Block et al., 2012; Robinson-O'Brien et al., 2009; Ozer, 2007).

School-based vegetable gardens may furthermore support communities to address the third SDG, which focuses on the promotion of healthy lives and a state of well-being for all people (UNDSEA, 2015), as vegetable gardening can improve the nutrition of individuals, as well as families and groups of community members (Armstrong, 2000). Furthermore, the fifteenth SDG goal refers to the protection, restoration, promotion and sustainable use of terrestrial ecosystems, as well as to the management of forests and reversal of land degradation. In this regard, school-based vegetable gardens can bring learners in contact with nature, while they are being taught a sense of ownership, as well as responsibility and pride in what they plant and grow (Neathery, Glynn & Long, 1997; Earthworks, 2004). School-based vegetable gardens may thus change learner's attitudes about taking care of the environment and on a bigger scale, impacting

environmental sustainability (Lekies & Sheavly, 2007; Project Food, Land, & People, 2000).

2.3.2 SOUTH AFRICAN RESPONSES TO ALLEVIATE HUNGER AND MALNUTRITION

In the current economic climate, South Africans attempt to combat food insecurity by buying food in bulk, utilising shopping lists, and relying on broader natural resources, neighbours and relatives for food, so that learners can have enough to eat (Galhena, Freed & Maredia, 2013). In different parts of the world, urban farming and gardening are incorporated in developing countries to alleviate poverty and improve health (WHO, 2003) as fruits and vegetables form an important part of a balanced diet, providing minerals, vitamins, and other antioxidants (Orsini, Kahane, Nono-Womdim & Gianquinto, 2013). The consumption of traditional African vegetables have lately received increased attention in terms of their nutritional value and potential for strengthening nutrition and food security in resource-constrained households (Ochieng et al., 2016). Aliber and Hart (2010) estimate that in South Africa, approximately three million small-scale farmers, of which the majority are women, produce food for their own household consumption. Due food insecurity experienced by many South African households, vegetable gardening may provide families with a safety net to fall back on when facing financial difficulty (Baiphethi & Jacobs, 2009). Research indicates that households with a vegetable garden often do not skip a meal, and will eat at least three meals a day (Jacobs et al., 2016). Coincidently, households who have a vegetable garden often consists of more members, which implies that members can share gardening responsibilities to ultimately have a more positive food security status (Jacobs et al., 2016).

One initiative that has been introduced in South Africa is the Ndunakazi Project (Oelofse, Faber, Benade, Benade & Kenoyer, 1999)), which involves a crop-based approach where communities are supported to implement home-based vegetable gardening. The project has resulted in various positive contributions, such as community members showing a wider variety of food intake, improved consumption of Vitamin A-rich foods, as well as a decrease in Vitamin A-deficiency and certain diseases. Another contribution from the project relates to the community members gaining a sense of liberation and empowerment as they expand their existing understanding of what contributes to a healthy diet (Oelofse et al., 1999).

Another initiative, the Lusikisiki Project (Faber & Laurie, 2011), focuses on technology transfer, the empowerment of communities, and the involvement of governmental departments (health and agriculture). In this project, agricultural extension officers took the role of agricultural advisors in mediating the relationship between researchers and community members. Community members were provided with nutrition education regarding which vegetables are rich in Vitamin A; yielding positive returns, where community members displayed enhanced knowledge concerning Vitamin A nutrition and improved consumption of Vitamin A-rich vegetables which in turn aided healthy growth amongst learners (Faber & Laurie, 2011).

In South Africa, many learners in resource-constrained communities attend school without eating breakfast (Department of Basic Education, 2014; Devereux & Sabates-Wheeler, 2011). As one response, the National School Nutrition Programme (NSNP) was introduced in 1994, in an attempt to addresses the link between nutrition and education (Patel, 2015; Department of Education, 1994) as a component of the Reconstruction and Development Programme (RDP). The NSNP aims to provide at least one meal per child per day to approximately 8.8 million primary and secondary school learners attending three fifths of all government schools across South Africa (Department of Basic Education [DBE], 2014). According to the DBE (2014); each meal has to include a protein, a starch, and a fruit or vegetable portion (DBE, 2014). The purpose of the NSNP (Department of Education, 1994) programme is to enhance the educational experiences of underprivileged learners by creating an opportunity for enhanced punctual school attendance and concentration, by alleviating short-term hunger and promoting overall health.

In spite of various efforts to alleviate hunger, this phenomenon still remains a considerable challenge, due to the prevalence of poverty and unemployment (Hall & Wright, 2010). In 2004, the National School Nutrition Programme (NSNP) was taken over by the Department of Education (Department of Basic Education, 2014) with one of the three sub-programmes dealing with the realisation of sustainable food production initiatives and the transference of skills to school communities and learners to improve household food security (Department of Education, 2008).

2.4 POTENTIAL VALUE OF SCHOOL-BASED VEGETABLE GARDENS

In 2008, it was estimated that roughly around 6 503 schools nationally, had school-based vegetable gardens, in comparison to 3 058 school-based vegetable gardens in 2005 (Department of Education, 2008). School-based vegetable gardens imply a

unique type of community garden, located on land used primarily for educational purposes (Birky & Strom, 2013). School-based vegetable gardens are regarded as valuable assets, as they hold benefits for the wider community, and imply the potential of changing individuals' access to nutritious food (Chomitz et al., 2010; Harris, Bargh & Brownell, 2009). School-based vegetable gardens may have a positive effect on community members' psychological, physical and social aspects of health and wellbeing (Somerset et al., 2005). Furthermore, school-based vegetable gardens can successfully and cost-effectively address the challenges of obesity, extreme hunger, and poverty experienced by resource-constrained communities (Ratcliffe, Merrigan, Rogers & Goldberg, 2011; Hedley et al., 2004).

In countries such as the United States of America, school-based vegetable gardens have become a strategy to promote healthy lifestyles amongst learners (Ozer, 2007). Individuals who engage in gardening are generally more relaxed, show improved confidence and a bigger variety of interests (Brown & Jameton, 2000; Armstrong, 2000), and are usually able to utilise gardening as a form of relaxation (Relf, 2006; Armstrong, 2000; Brown & Jameton, 2000). Research furthermore indicates that individuals who engage in gardening show improved well-being and fitness (Blair et al., 1991; Armstrong, 2000; Lee et al., 2002) as well as better food security (Brown & Jameton, 2000; Tucker, 2002). Access to vegetable gardens has been recognised as synonymous with fresh food intake (Madaleno, 2001; FAO, 2014), more satisfactory consumption of vegetables (Madaleno, 2001; Tucker, 2002) and a healthier diet followed by individuals (James, Nelson, Ralph & Leathey, 1997; Blair et al., 1991; Madaleno, 2001).

2.4.1 ADDRESSING NEEDS ON MULTIPLE LEVELS

The developmental phase of childhood is characterised as the most crucial phase for healthy growth and development (Wright, Parker, Lamont & Craft, 2001). Significant eating habits that will have implications for adult vegetable consumption are often developed in this phase (Kelder, Perry, Klepp & Lytle, 1994; Morland, Wing, Diez Roux & Poole, 2002; Morland & Filomena, 2007). When younger learners consume considerable amounts of fruit and vegetables from a young age, it may affect healthy food preferences when they grow older (Margarey, Daniels & Smith, 2001; FAO, 2010). In addition to repeated exposure to fruit and vegetables having a positive effect on intake (Anzman-Frasca, Savage, Marini, Fisher, & Birch, 2012), learners' knowledge and attitudes toward fruit and vegetable consumption may improve, as well as their

willingness to eat new and unfamiliar fruit and vegetables (Block et al, 2012; Robinson-O'Brien et al., 2009; Ozer, 2007; Lineberger & Zajicek, 2000; Ratcliffe et al., 2011). In this regard, research further indicates that when fruit are available in a school tuck shop, it may lead to increased fruit consumption amongst learners (Moore & Tapper, 2008).

Existing studies indicate that school-based vegetable gardens imply strong community building components that can potentially promote teamwork and interaction (Faddegon, 2005; Thorp & Townsend, 2001). School-based vegetable garden projects can provide a platform where members of a school community exchange ideas that may possibly promote community networks, create stronger interconnection between members, and improve community skills (Twiss et al., 2003). School-based vegetable gardens therefore hold the potential for bringing people together, as it can provide members of a community with a platform from which to interact, share skills, and connect to social networks (Twiss et al., 2003).

Research (Lee et al., 2002) furthermore indicates that the presence of school-based vegetable gardens can motivate parents to also start their own vegetable gardens at home (FAO, 2010). In addition, learners may transfer the knowledge they gain from being involved in vegetable garden projects to their families, and may also take vegetables home to share, which can in turn have an effect on food consumption practices (Heim, Bauer, Stang & Ireland, 2011; Heim, Stang & Ireland, 2009). School-based vegetable gardens can furthermore provide underprivileged or migrant parents with the opportunity to become more involved at school by providing services in the form of practical gardening skills (FAO, 2010).

Schools may use the produce from the vegetable gardens in a variety of ways. In some schools, learners benefit by eating the vegetables, or using them in culinary classes (Ozer, 2007; FAO, 2005a), while other schools may use the vegetables to supplement school feeding schemes and school nutrition programmes to prepare meals and snacks, which can reduce short-term hunger, and improve healthy weight gain and micronutrient consumption, which may in turn prevent stunting, contribute to lower levels of absenteeism and hunger-related illnesses, and improve learners chances to learn (FAO, 2010; FAO, 2014; Gelli, 2010; Adelman, Gilligan & Lehrer, 2008; Briggs, 2008). Produce may also be traded or sold to learners, parents and staff in order to sustain school-based vegetable gardens (FAO, 2005b). It is furthermore reported that some schools give produce to learners to take home (FAO, 2005b), as such that

parents might be informed. Finally, schools sometimes donate surplus produce to orphanages and less fortunate learners, as well as to members of the community (FAO, 2005b).

In terms of learner performance, school-based vegetable gardens have been found to support academic performance (Viola, 2006; Blair, 2009) and assist underachievers in acquiring literacy skills and building their self-esteem (The National Gardening Association, 2000). A school-based vegetable garden implies “a rich diet for cognitive development” (Kellert, 2002:125), as it is information-rich, changes constantly, creates opportunities for creative investigation, and can reinforce opportunities for logical examination, experiential observation and demonstration by learners (Kellert, 2002).

2.4.2 GARDEN-BASED LEARNING WITHIN THE SCHOOL CONTEXT

The school setting provides a practical space where healthy eating patterns can be taught (FAO, 2005a) by qualified personnel (FAO, 2005a). In South Africa, nutrition education is primarily included in the Integrated Nutrition Programme (INP) (DOH, 2008), where nutrition promotion and education are implemented to reduce malnutrition. The WHO (2006) suggests an integration of nutrition education in all school subjects, with a clear link to school kitchens, physical activities, as well as parental and community involvement. The National School Nutrition Programme (NSNP) compliments the INP (DBE 2015), as the meals provided through the NSNP serve as an example to learners of what constitutes a nutritious meal. These examples may form part of classroom discussions initiated by teachers (WHO 2006; Faber, Witten & Drimie, 2011; Kupolati, Gericke & MacIntyre, 2015).

According to Briggs, Fleschhacker and Mueller (2010) it takes approximately 50 hours per year to impart attitudes and behaviours. In order for nutrition education to be effective, adequate time should thus be spent in the classroom, in an attempt to positively modify the eating behaviour of learners. Another prerequisite for effective nutrition education is the practice where teachers regularly refer back to instructional materials, such as posters, charts and workbooks that detail nutrition topics as outlined in the National Curriculum (FAO 2005a). Nutrition education in schools can, however, be challenging, due to factors such as time constraints, lack of knowledge from teachers, limited materials, and support (Kupolati et al., 2015).

School-based vegetable gardens can provide learners with an opportunity for activity-based learning and may also add a physical domain to education (Devine, Wolfe,

Frongillo & Bisogni, 1999). Learners can, as a result, gain confidence when understanding the processes of nature, and acquire core science concepts during real-world experiences with living things in the environment (Graham et al., 2005). School-based vegetable gardens can be seen as learning laboratories, that may provide aesthetically pleasing environments in which learners can learn (Hedley et al., 2004), during arranged times or at break-times when learners can voluntarily assist in the garden as coordinators or volunteers, or can just spend time in the garden (Pranis, 2004).

When learners work in school-based vegetable gardens, they have to rely on skills and knowledge not normally used in the classroom. Gardening is mostly conducted in a group setting, requiring of learners to work together and help each other in order to perform tasks such as sowing, weeding, or expanding the garden (Marr, 1997; Moskowitz, Malvin, Schaeffer, & Schaps, 1983). These tools imply skills such as visual-spatial skills, physical strength, and building skills (Marr, 1997; Moskowitz et al., 1983). In addition, gardening may have a positive effect on peer relationships and provide learners who struggle academically in a traditional classroom with the chance to contribute knowledge and show their strengths during practical activities.

Joint gardening may bring about a shuffling of peer group interaction when learners who do not normally interact with others get the opportunity to do so (Marr, 1997; Moskowitz et al., 1983). This can support their confidence as success in one capacity and can potentially be taken back into the classroom (Marr, 1997; Moskowitz et al., 1983). School-based vegetable gardens may also result in a more positive school culture when learners experience a sense of collective pride as they take ownership and see the garden as “theirs” (Montessori & Gutek, 2004; The National Gardening Association, 2000).

On a broader level, school-based vegetable gardens can improve the physical and social environment of a school (Viola, 2006; Blair, 2009) and cultivate in learners an improved attitude towards the environment as they develop pride in the garden they work in (The National Gardening Association, 2000). In this regard, Blair (2009) views school-based vegetable gardens as a valuable avenue to teach learners Systems Ecology. Through curricular activities such as local farm visits, farm-to-school lunch projects, recycling, and composting, learners may get the opportunity to learn about food production consumption patterns, see where food come from and gain insight into the impact everything has on the natural environment (Morgan et al., 2010). Blair

(2009) argues that learners' engagement in school-based vegetable gardening will shape their attitudes as adults concerning nature and will define the value attached to the environment. Similarly, Neathery et al. (1997) indicate that with time, through frequent exposure, learners may act more consciously towards the environment and increasingly respect nature.

Through garden work, learners can also learn more about how seasons affect the environment. As their senses are involved, they can experience hands-on learning, and gain knowledge on the benefits of vegetables while acquiring the skill of planting their own food (Ozer, 2007). Especially in South Africa, practical skills such as agricultural skills are of great value (Somerset et al., 2005) for learners to be able to find employment after school, or to be able to support themselves and their families. School-based vegetable gardens do therefore not only have a positive effect on schools, but also on surrounding communities, as new skills learned by learners can be transferred to other community members (The National Gardening Association, 2000).

2.4.3 REQUIREMENTS AND CHALLENGES RELATED TO THE ESTABLISHMENT OF A SCHOOL-BASED VEGETABLE GARDEN

Knowledge is an important skill needed for successful and sustainable school-based vegetable gardens (FAO, 2014). More specifically, knowledge on how to make compost and fertiliser, and how to transplant seedlings is crucial to the success of a garden (Goodwin, 2008). Similarly, knowledge on crop rotation, inter-planting, relay planting and inter-cropping can exponentially increase the sustainability of a vegetable garden (FAO, 2014). Research furthermore indicates (Goodwin, 2008; Ozer 2007) that teachers regard knowledge on soil and plants that could be planted to be a necessary skill in managing a school-based vegetable garden. Another important aspect to consider is the transition period between when a garden is started, and the time it takes for the garden to become a long-term project that only requires maintenance (Davis, Spaniol & Somerset, 2014).

According to the FAO (2014), it is also important to know which types of vegetables will grow best in the specific area, and what the sowing and harvesting time-frame of each is (Lee et al., 2002). To ensure successful and sustainable school-based vegetable gardens, there are certain gardening activities that need to be performed throughout the year at regular intervals, such as: watering, weeding, cultivating, pest control, and disease control (FAO, 2014). In terms of the required equipment, Bremner

and Pusey (1990) list the following as essential to be able to develop and maintain a sustainable school-based vegetable garden: pangas, wheel barrows, hoes, spades, shovels, watering cans, hose pipes, garden forks, rakes, buckets, hand shovels, sticks and string, and a tape measure (FAO, 2014).

According to Viola (2006), a school-based vegetable garden project requires a variety of skills to deal with challenges that may influence the project's sustainability. Examples of success stories and best practices suggest that sustainable school-based vegetable garden projects are often grown organically, start small and are expected to progress slowly (Ozer, 2007). Some of the most successful initiatives are those that initially had long-term vision yet developed slowly over many years with continued support, as well as the on-going involvement of the community (United Nations, 2010). Sustainable school-based vegetable garden projects are typically directed by clearly formulated aims, links to good health and school feeding initiatives, and whole school participation (United Nations, 2010).

Schools with successful and sustainable vegetable gardens often attribute their success in terms of development, implementation and maintenance to the extensive and enduring support of key role-players such as the principal, teachers, parents, learners and community members (Davis, Ventura, Cook, Gyllenhammer & Gatto, 2011; Ozer, 2007; Azuma, Horan & Gotlieb, 2001; Somerset et al., 2005). That is to say, teachers and learners who work in the garden require the regular and enthusiastic support of school principals, who are able to enthusiastically promote school-based vegetable gardening (Vesilind & Jones, 1998). It seems clear that successful school-based vegetable gardens will not flourish without the support of key role-players, such as the local education authority, involvement from the local agricultural and health services, as well as experts from outside the school and other schools (FAO, 2005b). Utilising the help of key role-players may, for example, improve the sustainability of a gardening project in terms of aspects such as design, initial labour, development of a curriculum, uses for harvested produce, and advice on which gardening activities to incorporate (Hermann et al, 2006; Ratcliffe et al., 2011).

In addition, successful school-based vegetable gardening is dependent on the enthusiasm and diligence of the teaching staff and learners (Lee et al., 2002). Goodwin (2008) emphasises the importance of key role-players having a positive attitude towards school-based vegetable gardens in order to ensure transference of a positive

attitude to communities, upliftment, and possibly a decline in poverty, vandalism and theft. In addition, Goodwin (2008) indicates that, after the benefits of a school-based vegetable garden has been established and the value for property has been instilled, a culture of self-help may be cultivated amongst all role-players, driven by personal beliefs and values.

Literature emphasises that teacher training and assistance are essential for innovation to be put into practice (Hungerford & Volk, 1990) and that a lack of in-service training and teacher skills to deal with problem-solving may be a barrier to the implementation of school-based vegetable gardening interventions (Lane, Wilke, Champeau & Sivek, 1994). In this regard, existing studies (Brunotts, 1998; Faddegon, 2005; Graham et al., 2005) reveal that teachers are often not agriculturally well-educated and may lack basic plant-growing knowledge and skills. A study by Goodwin (2008) reveals that only selected teachers have their own vegetable gardens at home, potentially leaving them inexperienced on the topic. Many have had limited training in terms of gardening and some are not interested in gardening (Brunotts, 1998; Faddegon, 2005; Graham et al., 2005). Other studies however (Graham et al., 2005) indicate that teachers are usually supportive of school garden projects based on insight in terms of the value they may hold for academic performance and healthy eating.

Research indicates that, in addition to teachers and volunteers, an appointed, dedicated coordinator is important for maintaining a successful school-based vegetable garden (Ozer, 2007). On the other hand, school-based vegetable garden projects with only one ‘champion’ or leader may also be vulnerable to failure in the event of staff turnover, burnout or other circumstances (Ozer, 2007), that may leave the garden vulnerable to failure in the event of the coordinator not being able to attend to the garden. School-based vegetable gardens are thus often more successful when more people are involved (Ozer, 2007).

According to Ozer (2007), it is not clear whether it is best to hire paid staff members to organise school-based vegetable garden projects, or to leave gardens in the hands of teachers as collective agents. According to the Royal Horticultural Society (2015), as well as Hutchinson et al. (2015), gardening projects that are managed by independent organisations in schools do not always yield improved learner knowledge and attitudes when compared to teacher-led interventions. External agents, who are often part of the initial phase of starting school-based vegetable gardens may find it difficult to pay regular visits to schools, which may be situated in remote rural areas where the project

may deteriorate after initial intervention (Viola, 2006; Goodwin, 2008). Other studies have shown that, in order to be sustainable, school-based vegetable gardens require dedicated and experienced volunteers, master gardeners or paid coordinators (Alexander, North & Hendren, 1995; Brynjegard, 2001; Thorp & Townsend, 2001).

Indigenous knowledge and experience of community members, who can contribute knowledge and expertise, are additional resources that are vital for success and sustainability (FAO, 2010; Galhena et al., 2013). Expert gardeners from the community can thus be invited to share their knowledge and techniques with teachers and learners (FAO, 2015). In addition, visits to community members' successful gardens may raise the status of gardening amongst learners and teachers (FAO, 2005a). To promote parental involvement, schools can, for example, host events and functions around and in the garden, send produce home, and give homework assignments that require of parents to assist learners in practically learning gardening skills (Ozer, 2007). Parents who tend to school-based vegetable gardens are essential during the school year and especially during holiday times when teachers and learners are not available to attend to gardens (Ozer, 2007).

Schools with vegetable gardens may rely on external funding to sustain their gardens (Azuma et al., 2001; Ozer, 2007). Role-players should however aim to find ways of utilising existing resources and working towards a situation of not being dependent on external funding, but to utilise this as an additional resource which may not necessarily always be available (Azuma et al., 2001). Studies suggest (Lee et al., 2002; Azuma et al., 2001) that gardens with limited funding do not necessarily imply less value for learners, and that limited finances are thus not necessarily an obstacle when aiming to establish successful vegetable gardens (Lee et al., 2002).

Media events or promotional activities (e.g. fundraising or meal-sharing occasions), which take place at a school garden, can display and market a gardening programme (Wright & Rowell, 2010). School events, such as graduations and sport events, can also be used to sell vegetables from the garden to showcase such an initiative (FAO, 2005b). At the same time, a garden can thus become a platform to raise awareness and funds (FAO, 2005b). Some schools have furthermore found that, by making school-based vegetable gardens part of school activities, different role-players may become involved and excited about such projects (Somerset & Markwell, 2009). If school gardens are attractive to look at, it can furthermore attract community support and investment (Somerset & Markwell, 2009).

2 .5 THEORETICAL FRAMEWORK

I relied on the social ecological model of Bronfenbrenner (1979)[6] as theoretical framework for this study, formulated from the overarching perspective of positive psychology. The social ecological model (Bronfenbrenner, 1979) implies that behaviour will occur due to interaction amongst individuals and their environments (Duncan et al., 2007). Based on the social ecological model theory, school-based vegetable gardens can be regarded as a product of the interaction of individuals and their environments, where individuals cultivate physical resources in order to produce healthy food (James et al., 1997; Blair et al., 1991; Madaleno, 2001).

Trickett, Kelly and Vincent (1985) highlight a few principles of the social ecological model as relevant when focusing on best practices to sustain school-based vegetable gardens. These principles include interdependence, distribution of resources and adaptation. To this end, the social ecological model (Bronfenbrenner, 1979) emphasises that all parts of a social context are interrelated, and influenced by other parts. In other words, changes in one part will bring about changes in another part (Duncan et al., 2007). When change occur within individuals or their relationships (e.g. when a teacher leaves the school), a change can occur in the dynamics of the school, leaving a role unfulfilled. For example, when the frontrunner of a school-based vegetable garden leaves, this may in turn affect the garden's sustainability.

Positive Psychology implies a focus on the assets and strengths that may permit individuals and communities to prosper (Seligman & Csikszentmihalyi, 2000). Positive psychology theory is based on the assumption that people want to live significant lives, develop themselves, and improve their experiences of affection, work and entertainment (Seligman & Csikszentmihalyi, 2000). By working from this perspective, the strengths and resources present within the 'champion' schools who participated in this study were investigated, and deemed necessary to manage sustainable gardens. Many schools possess the necessary resources and skills to uphold sustainable vegetable gardens, but fail to identify and utilise such available resources (Goodwin, 2008). Working from a positive psychology framework, however, allowed me to view communities, schools and participants as active in their own development, and as change agents, who want to grow, develop and thrive (Seligman & Csikszentmihalyi, 2000). When considering a school as a system, the school's functioning can be understood by focusing on what the available resources are and how such resources

[6] This is cited as an original if dated source on the social ecological model.

are distributed, utilised and developed.

Extending Bronfenbrenner's social ecological model (Bronfenbrenner, 1979) to the current study of key role-players' perceptions of best practices on sustainable school-based vegetable gardens, places key role-players in the centre of an interactive system that consists of five subsystems, namely the microsystem, mesosystem, exosystem, macrosystem and chronosystem (Addison, 1992; Bronfenbrenner, 1979). The microsystem entails individuals' immediate environments (contexts) (Bronfenbrenner, 1977) and is associated with relationships and friendships (Addison, 1992). Individuals (key role-players) experience their everyday reality and direct socialisation in the microsystem (Bronfenbrenner, 1978). Direct socialisation, relationships and friendships will impact both towards and away from the community (Bronfenbrenner, 1979). The community may thus affect individuals' (key role-players) beliefs about and behaviour towards best practices on sustainable school-based vegetable gardens; while individuals (key role-players) may affect the beliefs and behaviour of the community (Bronfenbrenner, 1986). According to Thorp and Townsend (2001), school-based vegetable gardens may have a positive impact on the microsystem by enhancing learners' learning, improving vegetable consumption, and promoting positive behaviour.

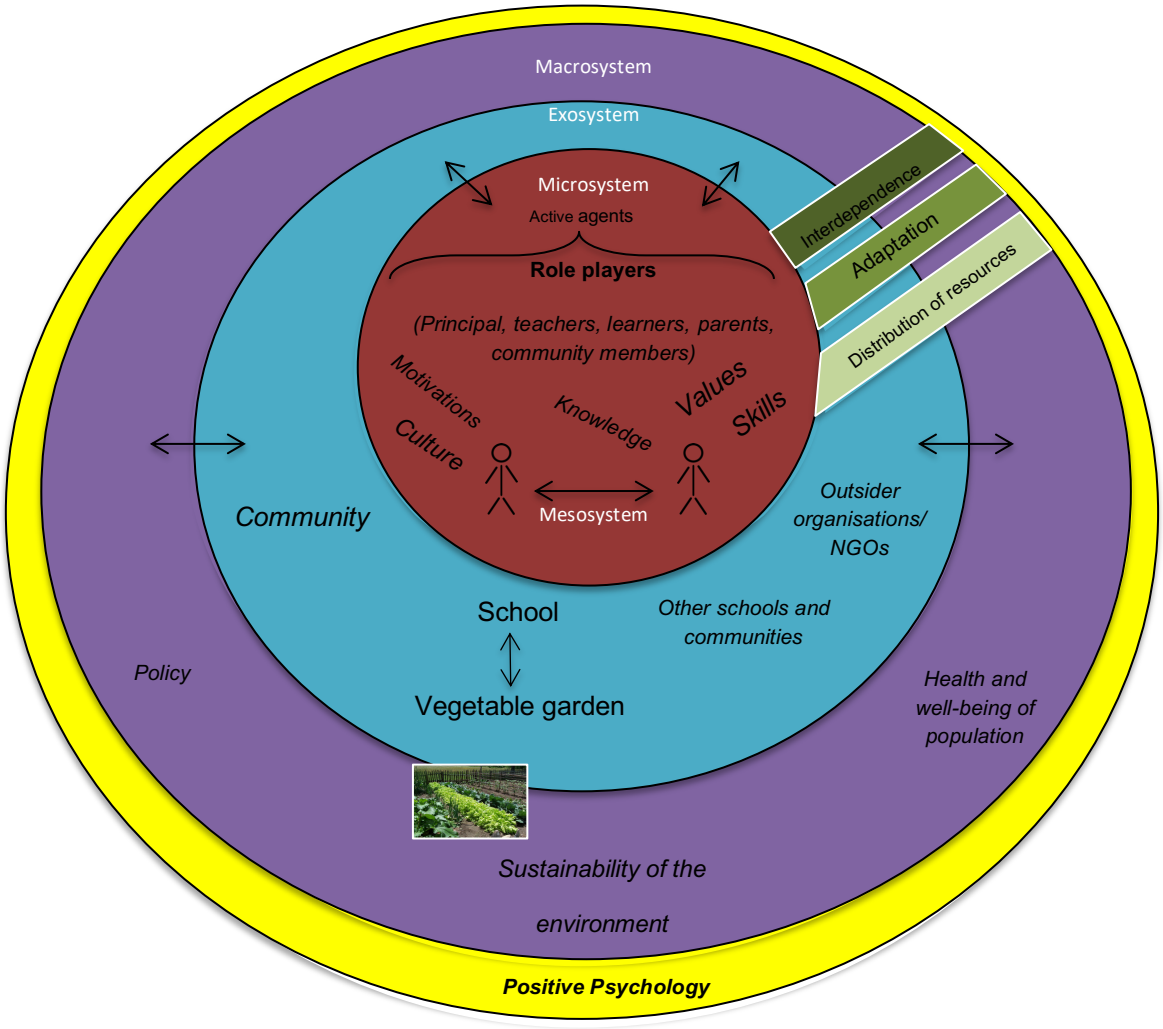
The second system, the mesosystem, represents a set of microsystems, where individuals, such as key role-players, interact with one another (Bronfenbrenner, 1986). The mesosystem consists of relationships and friendships between settings such as the home, school, community and peer groups (Bronfenbrenner & Morris, 2006). Furthermore, the mesosystem includes factors that may influence individuals (key role-players) and their perceptions of for example community-based best-practices to sustain school-based vegetable gardens. Events occurring in the community (mesosystem) will have an effect on community members' (key role-players) ideas, opinions and perceptions of best practices on sustainable school-based vegetable gardens, while community members' (key role-players) perceptions will have a reciprocal effect on the macro-system. Within the mesosystem, school-based vegetable gardens can create the opportunity for role-players to work together, and for learners to cooperate, potentially resulting in improved peer relationships between learners and adults (Blair, 2009).

According to Bronfenbrenner (1986) and Addison (1992), the exosystem can be regarded as the connection between systems where individuals do not have any

specific position or environments where individuals are active participants. The exosystem consists of social settings, such as neighbourhoods, support networks, and the broader community, that may potentially influence individuals' (key role-players) perceptions of best practices on sustainable school-based vegetable gardens (Bronfenbrenner & Morris, 2006). Within the exosystem, school-based vegetable gardens can improve the social environment and organisational capacity of a school (Viola, 2006; Blair, 2009). In the resource-constrained community where this study was undertaken, the community context can be viewed as the exosystem. Within the community context, existing school-based vegetable gardens promise benefits in the form of the potential to change community members' attitudes concerning environmental conservation and healthy food consumption practices (Lekies & Sheavly, 2007). In addition, the perceptions of best practices held by key role-players participating in this study may potentially influence the perceptions of teachers and parents at other schools to become involved with and develop sustainable school-based vegetable gardens in more South African schools.

The macrosystem (Bronfenbrenner, 1986) consists of political ideologies, cultural beliefs, societal customs, laws and values within which individuals (key role-players) function. If successful, school-based vegetable gardens may possibly impact on policy development, such as curriculum adaptation, and for example, include more hands-on, practical components, which may result in learners enjoying learning as they use their senses, and having the opportunity to apply their skills and excel in school (Thorp & Townsend, 2001). Figure 2.1, which is adapted from Bronfenbrenners' (1979) model, provides a visual presentation of my selected theoretical framework.

Figure 2.1: Theoretical framework of the study (adapted from Bronfenbrenner, 1979)



2.6 CONCLUSION

The aim of this chapter was to discuss existing literature concerning the topic of this study. To this end, I investigated the need for school-based vegetable gardens, potential benefits of school-based gardens, challenges associated wit the sustainability, as well as characteristics of sustainable school-based vegetable gardens. I concluded by explaining the theoretical framework that informed the manner in which I conducted my research and interpreted the results.

In Chapter 3 I discuss the research methodology of the study, by explaining the selected paradigms and research design in which the study is situated. Furthermore, I describe the data generation, documentation and analysis strategies I utilised. I conclude the chapter by discussing the quality criteria and ethical considerations considered and respected.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 INTRODUCTION

In Chapter 2, I presented the theoretical framework that guided this study, namely Bronfenbrenner's social ecological model (Bronfenbrenner, 1979), situated within an ethos of positive psychology (Seligman & Csikszentmihalyi, 2000). I reviewed existing literature on the current global food and nutritional situation, as well as related global responses. I focused on food and nutrition security in South Africa, together with national responses, specifically for resource-constrained communities. To this end, I elaborated on community-based initiatives to address hunger and malnutrition and then discussed school-based vegetable gardens as one possible way of providing support.

In Chapter 3, I elaborate on the research process I introduced in Chapter 1. I explain and justify the paradigmatic and methodological choices I made and describe how I ensured rigorous and ethical research. Lastly, I elaborate on my role as researcher. Table 3.1 provides an overview of the research methodology of the study and is followed by detailed discussions in the subsequent sections.

Table 3.1: Overview of research methodology

PARADIGMATIC ASSUMPTIONS	
Epistemological paradigm **Methodological paradigm** **Research design**	Interpretivism Qualitative research Case study, applying PRA principles
CASE AND PARTICIPANTS	
Selection of case	Convenience sampling
Selection of participants	Purposeful sampling
DATA GENERATION AND DOCUMENTATION	
Data generation techniques	**Data documentation techniques**
PRA-based workshops	• Visual data (posters and photographs) • Audio recordings and verbatim transcriptions
Observation	• Field notes • Visual data (posters and photographs)
Semi-structured interview	• Field notes • Verbatim transcriptions of audio recordings
Reflection	• Research diary

DATA ANALYSIS AND INTERPRETATION
Inductive thematic analysis and interpretation
QUALITY CRITERIA OF THE STUDY
Credibility, transferability, dependability, confirmability and authenticity
ETHICAL CONSIDERATIONS
Autonomy, respect, non-maleficence, beneficence and justice, confidentiality, consent and protection from harm, equity, fairness

3.2 PARADIGMATIC APPROACHES

In this section I discuss the epistemological and methodological approaches I selected. A paradigm, according to Babbie (2015), is regarded as a framework, constructed for the purpose of organising observations and ideas. Nieuwenhuis (2007a) elaborates that a paradigm constitutes a set of assumptions based on an aspect of reality which ultimately leads to a particular worldview. Paradigmatic approaches are essential to research, because it allows the researcher to form a better understanding of the worldviews and behaviours of participants, and in essence guides the researcher's thoughts and actions (Henning, Van Rensburg & Smit, 2004; Mertens, 2010).

3.2.1 EPISTEMOLOGICAL PARADIGM: INTERPRETIVISM

I selected Interpretivism (Ponterotto, 2005) as meta-theory in approaching the study, as Interpretivism allows a focus on a research topic from the participants' points of view (Schwandt, 2000). An Interpretivist paradigm furthermore allowed me to gain a deep understanding of the personal worlds of the participants, by relying on their perceptions and interpretations thereof (Terre Blanche & Durrheim, 2002). This was a crucial requirement of the study, as the aim was to explore and describe the perceptions of key role-players regarding best practices on sustainable school-based vegetable gardens. Interpretivists believe that multiple constructed realities exist, which are subjective and influenced by the individual's experiences and perceptions, the social environment, as well as the interaction between individuals and researchers (Ponterotto, 2005). In line with the belief that no single truth exists (Smith, 1983), key role-players in this study approached the same phenomenon in a different manner, based on their perceptions thereof (Ponterotto, 2005).

Interpretivism furthermore proposes that reality is not objectively determined, but rather socially constructed (Husserl, 1965). If researchers want to understand people's perceptions of their actions, they ought to view these perceptions within the relevant social context (Hussey & Hussey, 1997). Interaction with the participants in the study

was necessary in order to understand their meaning-making process, so as to gain insight into how they successfully or unsuccessfully maintained school-based vegetable gardens throughout the years. I therefore had to be interactively linked and engaged in a process of mutual construction of meaning with the participants (Chesebro & Borisoff, 2007). During the current study, it furthermore became apparent that participants' perceptions were not merely related to intrinsic factors, but that the investigation also required a focus on the manner in which participants relate to one another, as well as to their environment in maintaining school-based vegetable gardens.

Interpretivists maintain that a researchers' values and lived experiences cannot be separated from the research process, and that researchers should therefore acknowledge, describe, and "bracket" their values, without going so far as to eliminate them (Smith, 2004). Having been trained within the social sciences, it was difficult for me to be removed from interaction, and therefore it was important to see myself as part of the research process. In order to gain insight into the participants' perceptions, I valued my role as a research tool, but realised the importance of bracketing personal values and opinions that might have surfaced during the data generation process (Ponterotto, 2005).

As my interest fell on key role-players' perceptions of best practices concerning school-based vegetable gardens, and not merely on expert opinions on a topic, Interpretivism thus allowed me to obtain insight into a context-specific quotidian phenomenon in which these role-players are involved (Sciarra, 1999). According to Goodwin (2008), several school-based vegetable garden projects have been implemented unsuccessfully, which shows that no universal truth exists on successful gardens, but that guidelines are rather about the personal perceptions of participants. In this way, Interpretivism typically allow for trustworthy findings to be obtained, in the sense that it captures participants' personal and unique perceptions (Bryman, 2001). As a result, the researcher can gain an understanding of "how" and "why", when gaining insight into the meanings and reasons, and ultimately human behaviour (Bryman, 2001).

Interpretivism has been criticised for limiting the generalisability of findings (Eisenhardt, 1989; Perry, 1998). The purpose of this research was, however, to investigate the perceptions of key role-players at specific schools, with no intention of obtaining findings that can be generalised. Another potential challenge of Interpretivism is that researchers may be biased in terms of their views of the participants or the context,

which may in turn influence the credibility of the results, and potentially provide a skewed representation of the actual situation (Ponterotto, 2005; Smith, 2004). In order to overcome this challenge, I took care to bracket my personal thoughts and opinions that surfaced throughout the research process (Ponterotto, 2005). By making use of a research diary (Ortlipp, 2008), I could record my own views and perceptions (where, when, and how they occurred) in order to guide me in viewing every situation from the participants' points of view (Schwandt, 2000). Furthermore, when working from an Interpretivist paradigm, it may sometimes seem that the data is unjustifiable or esoteric, as it mostly involves people's thoughts, perceptions and feelings (Schwandt, 2000). In order to ensure that the results of the study are trustworthy, I thus worked out a clear plan for the research in terms of data generation and aspects requiring my focus (McMillan & Schumacher, 2014). In addition, I engaged in regular reflective discussions with my supervisors.

3.2.2 METHODOLOGICAL PARADIGM: QUALITATIVE RESEARCH

For this study, I followed a qualitative research approach. This choice enabled me to obtain detailed explanations and interpretations of the data and to produce meaning from the generated data (Farquhar, Parker, Schulz & Israel, 2006). Qualitative research focuses on an understanding of the way in which individuals and groups make sense of their worlds by assigning meaning to their every day practices (Nieuwenhuis, 2007a). In addition, qualitative research aims to gain an understanding of the contexts in which behaviour occurs. For this purpose, researchers will study behaviour in natural settings with the aim of interpreting participants' perceptions (Nieuwenhuis, 2007a).

By working from a qualitative paradigm, I was thus able to extract "contextually laden, subjective, and richly detailed" (Byrne, 2001:372) descriptions of best practices on sustainable school-based vegetable gardens. Creswell (2007) confirms that qualitative research "begins with assumptions, a worldview, the possible use of a theoretical lens, and the study of research problems inquiring into the meaning individuals or groups ascribe to a social or human problem" (p. 37).

Qualitative research enabled me to work directly with participants during the data generation phase (Creswell, 2013). I aimed to address possible subjectivity and biases throughout the research process by reflecting (Clarke & Braun, 2013) on my own views and beliefs through the use of a research diary (Clarke & Braun, 2013; Nadin & Cassell, 2006). I was also able to remain flexible, and adapt to different settings and situations throughout the research process (Houser, 2009). In addition, a qualitative approach

enabled me to gain a comprehensive understanding of the research setting and allowed me to produce reflections on the complexities of human behaviour (Creswell, 2007; Nieuwenhuis, 2007a).

In terms of potential challenges, qualitative research may take more time and be more costly than quantitative methods (Creswell, 2013; Nieuwenhuis, 2007a). In order to ensure that the research was concluded on time, and kept as cost-effective as possible, a time-line and budget was set up and progress monitored. Another potential limitation, relates to the outcome of the data generation being dependent on the skills of the researcher (Byrne, 2001; Creswell, 2013). Before going into the data generation process, I thus spent a great deal of time on gaining experience on the data generation strategies that I were to use, in order to ensure that the quality of the collected data was not compromised.

3.3 RESEARCH METHODOLOGY

In this section, I discuss the research process in terms of the selected research design, selection of participants, as well as the data generation, documentation, analysis and interpretation strategies that I employed.

3.3.1 RESEARCH DESIGN

I utilised an instrumental case study design (Stake, 2013; Yin, 2003) with the application of Participatory Reflection and Action (PRA) (Baum, MacDougall & Smith, 2006) principles. Instrumental case study designs entail the selection of participants in order to examine or understand a certain aspect of their behaviour (Stake, 1995). A case study design can be described as an unsystematic inquiry into an event or a set of related events that aim to describe and explain the phenomenon of interest (De Weerd-Nederhof, 2001; Edwards, 1998; Lindegger, 2002). Yin (2003) further clarifies a case study as an experimental inquiry, whilst investigating a present-day phenomenon within a real-life context, where multiple sources of evidence are being used. Case studies, within the Interpretivist paradigm, strive to obtain a comprehensive and holistic understanding of participants' perceptions within a particular context, in order to investigate how participants make meaning of the phenomenon under study (Nieuwenhuis, 2007a).

An advantages of a case study design is that multiple sources and techniques are generally used in the data generation process (Nieuwenhuis, 2007a; Stake, 2013), which contributes to triangulation (McMillan & Schumacher, 2014) and crystallisation

(Stewart, Gapp & Harwood, 2017) in providing rich longitudinal information about individuals or particular situations (Lindegger, 2002). Case study designs have the further advantage of permitting new ideas and hypotheses to emerge through observation (Lindegger, 2002), and can give a voice to the voiceless (Nieuwenhuis, 2007a).

On the other hand, case study designs have been criticised for often being dependent on a single case, which arguably limits generalisation possibilities (Nieuwenhuis, 2007b). Counter-arguments however state that the purpose of case study research is not to generate generalisations, but rather to gain insight and understanding into the dynamics of a specific phenomenon (Bromley, 1991). The purpose of this study was not to create generalisations, but to investigate and describe the perceptions of key role-players regarding best practices on sustainable school-based vegetable gardens in a specific context. In this regard, Nieuwenhuis (2007a) states that a well-selected case can create a dewdrop within which the world can be reflected. Another potential disadvantage relates to the credibility of the findings (Lindegger, 2002). To this end, I documented data through video and audio recordings, which were transcribed, so that the data could be re-analysed at a later stage (Lindegger, 2002).

Participatory Reflection and Action (PRA) emphasises the production of knowledge in partnership with individuals to improve educational and social circumstances (Bhana, 2006). PRA makes use of concrete, visual and colourful methods, activities and materials (Ebersöhn, Eloff & Ferreira, 2007). The use of PRA-based techniques are based on the belief that visualisation will promote participation (Ebersöhn et al., 2007). These techniques are valuable, in the sense that they do not require specific literacy levels from participants, but rather focus on the representation of ideas by means of symbols, drawings or concrete objects (Ebersöhn et al., 2007).

PRA-based techniques can enable a researcher to gain insight into the meanings represented by participants (Chambers, 2003). Techniques I incorporated include trend and change analysis, that assisted participants in their reflections and discussions on the past, as well as reflections on events, and changes that occurred during the research (Ebersöhn et al., 2007). Other techniques included seasonal calendars that enabled participants to reflect on seasonal occurrences and trends (Ebersöhn et al., 2007). An advantage of PRA is that it promotes a sense of community and emancipation of every member of society (Bhana, 2006). A potential disadvantage, however, may be that it can deny individuality for the good of the

community (Bhana, 2006). To overcome this challenge, it was necessary for me to ensure that every participant felt heard and understood, so that data could be collected from the participants as a group, but also as individuals. During the PRA-based workshops, I thus facilitated the discussions in such a way that all participants had an opportunity to make a contribution to their group discussions.

A characteristic of a successful PRA-based project is not only that the researcher gains a better understanding of a problem or a specific implementation of an action to eliminate a problem, but rather that it raises awareness amongst participants of their own abilities. In addition, it may highlight existing resources that participants may have, in order to mobilise them towards social action (Bhana, 2006), as act of empowerment (Bhana, 2006). Through this study, participants had the opportunity to become aware of their own abilities and the resource they could be to others. This idea was realised when information collected through this study was presented at a colloquium in March 2016, where participants had the opportunity to share their skills and knowledge with other teachers and volunteers.

3.3.2 SELECTION OF RESEARCH SITE AND PARTICIPANTS

I utilised convenience sampling to select (Laher & Botha, 2012) five primary schools within a research-constrained community in the Nelson Mandela Metropole (Eastern Cape), as these schools had been participating in the broader STAR Project since 2003, and were therefore readily available (Mertens, 1998:265). Within the context of the study, one advantage of convenience sampling was that the research site was easily accessible (Terre Blanche & Durrheim, 2002). A limitation of convenience sampling may be that the results might be difficult to generalise (McMillan & Schumacher, 2014). The aim of this study however, was not to generalise results, but rather to gain an in-depth understanding of the perceptions of key role-players regarding best practices on sustainable school-based vegetable gardens so as to identify factors that may contribute to the sustainability and success of these gardens.

There were fourty-eight (n=48) participants in the study, with the group made up of teachers, parents and volunteers from the five selected primary schools in a resource-constrained community in the Eastern Cape. I relied on purposeful sampling (Maree & Pietersen, 2007) to select the fourty-eight (n=48) participants, based on some defining characteristics, keeping my specific purpose in mind (Maree & Pietersen, 2007). The participants were selected according to certain criteria, relevant to the research questions formulated. The selection criteria were namely that the participants had to

be active role-players involved in the school-based vegetable gardens at their schools; they had to be willing to participate voluntarily; and they had to be able to communicate in English. Table 3.2 provides an overview of the participants per school.

Table 3.2: Participants per school

SCHOOL	NUMBER OF GROUPS	NUMBER OF PARTICIPANTS	ROLE IN THE SCHOOL
School 1	3	20	Teachers, volunteers paid by Public Works
School 2	1	6	Teachers
School 3	2	10	Teachers, volunteers, principal
School 4	1	5	Teacher, volunteers, principal
School 5	1	7	Volunteers, parents

An advantage of using purposeful sampling to select participants was that it was not costly and time-consuming, and allowed me to gain in-depth information (McMillan & Schumacher, 2014). An implied challenge related to the fact that some participants, who could potentially contribute to the phenomenon at hand (Patton, 1990), might have been excluded. However, in this study, the purpose was to answer the formulated research questions, and to gain an in-depth understanding (Patton, 1990) of the perceptions of key role-players regarding best practices on sustainable school-based vegetable gardens. Therefore, the participants who were selected were considered to be informative (Marshall, 1996, p. 523).

3.3.3 DATA GENERATION AND DOCUMENTATION

I incorporated multiple data generation and documentation techniques in an attempt to improve the rigour of the current study (Terre Blanche & Kelly, 2002). I namely utilised PRA-based workshops, observation, a semi-structured interview, field notes, audio-visual techniques and a research diary (McMillan & Schumacher, 2014). I undertook two field visits (7 August and 1 October 2015), with the last visit serving the purpose of member checking.

3.3.3.1 PRA-Based workshops

PRA-based workshops took the form of small group discussions, during which participants received prompts on large pieces of cardboard, and were requested to capture their discussions and ideas (Ferreira, Ebersöhn & Botha, 2013). After small group discussions, all groups reported back to the rest of the group. PRA-based techniques imply the advantage of placing little demands on participants as it involves

flexible strategies and can take any form (Ebersöhn et al., 2007), which are often enjoyable to participants (Chambers, 2012) and can allow participants who are not highly literate to take part (Ebersöhn et al., 2007). Another benefit of PRA-based activities is that a lot of data can be generated in a short time-span (Cornwall & Pratt, 2010). On the other hand, according to Cornwall and Pratt (2010), PRA-based activities may result in data of diminished quality. To counter this potential challenge, I incorporated various data generation techniques, in order to triangulate data sources and enhance the quality of the data (Creswell, 2013). Photographs 3.1 and 3.2 illustrate how participants from Schools 1 and 2 constructed posters based on specific questions posed to the groups, while Photographs 3.3 and 3.4 illustrate how participants from Schools 3 and 5 engaged in group discussions during the PRA-based workshops.

Photograph 3.1: Compiling posters during PRA-based workshop at School 1

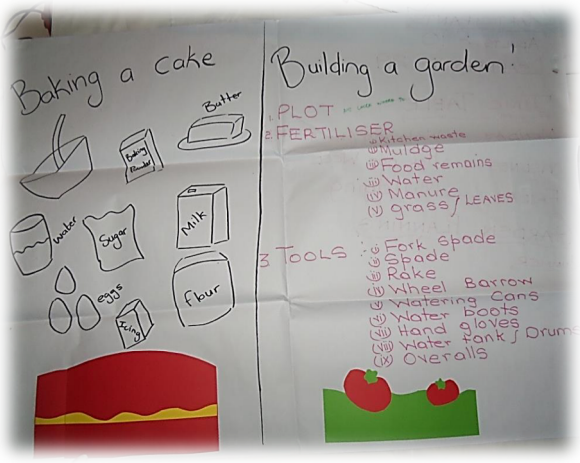
Photograph 3.2: Photograph of group discussions during PRA-based workshop at School 2

Photograph 3.3: Group discussion during PRA-based workshop at School 3

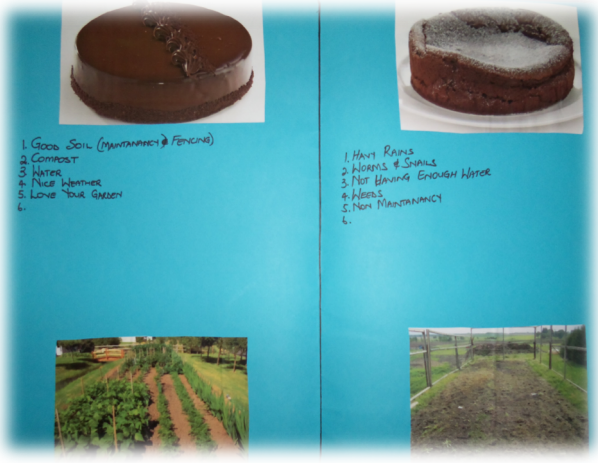
Photograph 3.4: Participants engaged in group discussion during PRA-based workshop at School 5

As stated, I facilitated PRA-based workshops in August and October 2015, at five schools, involving a total of eight groups and 48 participants. The aim of these workshops was to explore the perceptions of the participants on best practice for sustainable school-based vegetable gardens. Participants were asked to compile posters relating to different themes. In the first PRA-based workshop activity, participants were asked to name and elaborate on the ingredients they thought were important for a sustainable school-based vegetable garden. In this activity, the analogy of a cake with various ingredients was used. Photograph 3.5 shows a poster as constructed by participants from School 1 during the first activity.

Secondly, participants were given the example of how sometimes contributing factors cause a cake to fail, where at other times, it succeeds. Based on this comparison, participants had to state what factors contributes to a successful and sustainable school-based vegetable garden, and which are detrimental to the sustainability of the school-based vegetable garden. Photograph 3.6 shows a poster constructed by participants from School 5 during the second activity. Lastly, some schools (School 1 & 3) were asked to provide information regarding what activities are important in the various seasons and what challenges and rewards each season yields. Photograph 3.7 shows a poster constructed by participants from School 3 during the third PRA-based workshop activity. The third PRA-based workshop activity was done only at School 1 and 3 as these schools have successful school-based vegetable gardens, and could therefore provide information on what is important, challenging, and what rewards are yielded during each season. PRA-based workshops lasted approximately three hours, and all sessions were audio-recorded (Creswell, 2009) and transcribed (See Appendix C) (Terre Blanche & Durrheim, 2002).



Photograph 3.5: Poster constructed during first activity by participants from School 1



Photograph 3.6: Poster constructed by participants from School 5 during the second PRA-based workshop activity

Photograph 3.7: Poster constructed during third PRA-based workshop activity by participants from School 3

3.3.3.2 Observation

According to Kelly (2006), observation represents a researchers' experience or recollection of what is happening at a present moment. Similarly, Nieuwenhuis (2007a) regards observation as a process of gathering information through one's senses. Nieuwenhuis (2007a) emphasises the advantage of observation, allowing a researcher to record participants' patterns of behaviour, as well as events that occur, and the context in which it occurs. Adler and Adler (1994) comments by mentioning one of the potential downfalls of observation, arguing that it may be intrusive. In other words, participants may potentially behave differently in the presence of the researcher, as they may have in a setting without the presence of the researcher (Adler & Adler, 1994). In order to counter this challenge, I tried to create a natural setting with a relaxed atmosphere, characterised by sound relationships of trust. Another potential challenge, according to Nieuwenhuis (2007a), is that observation may be a subjective activity, with the researcher only focusing on certain aspects. To counter this challenge, I aimed to let go of biases and pre-existing ideas in order to see the situation as it was occurring. My research diary assisted me to reflect on my thoughts, and to identify any pre-conceived ideas and biases.

Observation enabled me to see and hear naturally occurring events at the research

> *"The participants were clearly knowledgeable and the one participant was clearly taking a leading role in the garden. Her passion and dedication for the garden was very clear"* (Research Diary, 1 October 2015).

site (McMillan & Schumacher, 2014), which align with the selected Interpretivist paradigm (Kelly, 2006). Observation generally has great value for qualitative studies when generating data that has meaning to participants and represent their beliefs or thoughts (Mertens, 1998). In the current study, observation provided me with the opportunity to gain an insider perspective into the group dynamics and behaviours of participants, and furthermore, to experience reality as the participants represented it (Nieuwenhuis, 2007a), in order for me to obtain a detailed understanding (McMillan & Schumacher, 2014) of the participants' perceptions. As the study focused on a specific area of investigation, I relied on selective observation, as this method involves a specific focus on a particular event in order to gain detailed information (Kelly, 2006). To enhance the quality of my observations I made reflexive notes (McMillan & Schumacher, 2014) in my research diary and wrote my notes straight after each field visit. As part of these records, I documented my personal beliefs in an attempt to minimise bias. The following excerpt from my research diary serves as illustration of how observation contributed to a more comprehensive overview of the data:

In addition to the observation of the participants during the data generation, I used observation to gather information on the surrounding context in which the school gardens are situated, as well as the participants' reactions and relationships (Kelly, 2006). This added valuable insight into the generated data, as captured in the following excerpt:

> *"The participants appeared to be a tight knit group who got along well. They seemed to respect each other and the principal and the coordinator. The coordinator and principal in return showed great appreciation for all the other participants even when these credited the success to them. It was clear that the school and teachers were the driving force behind the garden and that even though they made use of external resources; they did not depend on these. What stood out was how proud each participant was of the school garden and they were eager to show us their crops and brag about how many of what vegetable they had grown. The teachers treated the volunteers from the community, two elderly men, with a lot of respect and showed appreciation for their hard work"* (Research Diary, 1 October 2015).

3.3.3.3 Semi-structured interview

According to Nieuwenhuis (2007a), an interview involves a conversation between two people, where the interviewer asks a set of questions of the person who is interviewed in order to gain insight into a specific phenomenon by collecting information from the

interviewee in the form of beliefs, opinions or views. Within the interpretivist paradigm, interviews thus serve the purpose of gaining insight into participants' views or beliefs concerning a certain topic (Kelly, 2006). Nieuwenhuis (2007a) indicates that semi-structured interviews imply the benefit that such interviews do not take a long time to conduct, and the interviewer is able to probe and clarify during the interview. A potential pitfall of semi-structured interviews is that the interview is dependent on the skill of the researcher, who may potentially wander from the topic as the participant is talking (Nieuwenhuis, 2007a). In an attempt to counter this potential challenge, I relied on an interview guide (Appendix H) specific to the topic that guided me. A semi-structured interview was only conducted at one school, due to time-constraints caused by the amount of schools included in the study. Another reason for this was that the participant interviewed at School 1 could not be part of the PRA-based workshop activities, while at other schools, all key role-players were present during these activities.

I conducted one semi-structured interview (Kelly, 2006) with a participant at School 1, which provided me with an understanding of her perceptions on school-based vegetable gardens and how to promote sustainability. Interviewing, as part of the qualitative research approach required the use of open-ended questions (McMillan & Schumacher, 2014), as presented in Appendix H. In order to ensure that the participant shared her perceptions, and promote trustworthiness of the data (McMillan & Schumacher, 2014), I had to first create a trusting relationship and comfortable environment. I had to convey the message that the participant was heard (Kelly, 2006) through eye-contact, a genuine approach, and through conveying respect and sincerity (McMillan & Schumacher, 2014).

3.3.3.4 Field notes and research diary

According to Taylor, Bogdan and DeVault (2016), field notes provide a recording method whereby a researcher can write down observations. Farquhar et al. (2006), state that field notes thus enable a researcher to capture observations during or after data generation activities. In other words, field notes contain the researchers' account of what had happened during the research process (Patton, 1990). A benefit of field notes is that they allow for the recording of participants' general behaviour and events, as they occur (McMillan & Schumacher, 2014).

A potential challenge pertaining to field notes, according to Yuan (2001), is that these notes may not always be entirely accurate, because they are based on the researchers' observation. Similarly, Tessier (2012) states that field notes imply the risk of providing

a biased account of a researchers' experiences, and may not be a complete reflection of what had happened during the data generation process. To counter biased interpretation, I read parts of my field notes (see Appendix E) to the participants after each of the presentations during the PRA-based workshops, and I also incorporated my notes in the information that I presented to participants during member checking. It was, however, challenging to constantly write when participants engaged in PRA-discussions, as I wanted to remain respectful towards the participants and convey the message that all participants were heard. Therefore, even though I did not write many notes during data generation sessions, I relied on audio-recordings to return to the discussions at a later stage, and add to my field notes where relevant. In the end, there was a clear correlation between the posters that the participants compiled, and that which I had captured in my field notes (Yuan, 2001; Tessier, 2012).

According to Nadin and Cassell (2006), a research diary is a tool that can contribute to reflexivity, as it allows a researcher to reflect on his/her thoughts concerning every aspect of the research process. A research diary enables the researcher to document thoughts and observations that may otherwise be lost (Nadin & Cassell, 2006; Borg, 2001). Nadin and Cassell (2006), as well as Janesick (1999) mention, however, the disadvantage of a research diary being time-consuming, as it takes time to reflect on one's own thoughts. In this regard, Mauthner and Doucet (2003) suggest that dedicated time and opportunities be allocated for the researcher to engage in reflection. To this end, I made time to reflect on my thoughts before, during, and after each data generation session (see Appendix F).

Another potential challenge, as mentioned by Finlay (2002), is that a researcher may get lost in potential topics. To counter this, I compiled a list of topics to reflect on during my reflection sessions. A research diary supported me to reflect on my personal assumptions about the community and the research, as well as my personal thoughts during the research process (Creswell, 2013; Morrow, 2005). I reflected on my personal expectations, objectives, belief systems, and possible subjectivities (Ortlipp, 2008). In this way, a research diary assisted me in obtaining methodological rigour (Lincoln & Guba, 1994).

3.3.3.5 Audio-visual data documentation

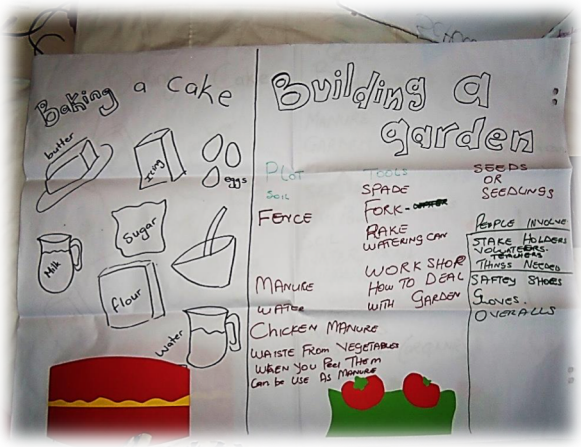
The main source of data generated during the interview and PRA-based workshops are verbatim responses of participants (McMillan & Schumacher, 2014), collected in

the form of audio data. An advantage of audio documentation in this study is that it facilitates a complete verbal account of all sessions. These recordings are safely kept and reliability checks can thus be done (McMillan & Schumacher, 2014; Kelly, 2006). Another advantage of audio recordings is that they can provide different perceptions and make cross-checks of data possible. Audio recordings enable the researcher to revisit participants' actual responses (Halcomb & Davidson, 2006) and are easy to store, as they are in digital format (Tessier, 2012).

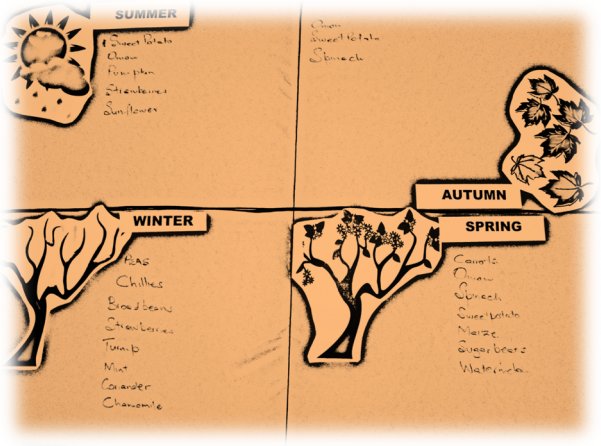
A potential disadvantage of audio-recordings as proposed by Bless, Higson-Smith & Sithole, 2013), is that the quality of the recordings may not always be consistent. Closely related to this is that McMillan and Schumacher (2014) add that audio recordings may be harmed by mechanical failure. To overcome this challenge, I ensured that I was familiar with the voice-recorder before data generation commenced, and knew where to place it to be able to record good quality sound, and therefore, no audio recordings were lost. Another potential disadvantage relate to audio recordings and the presence of voice recorders causing distrust amongst participants (McMillan & Schumacher, 2014). To this end, when obtaining informed consent from participants, I explained that I would use voice recorders. In addition, I made sure to present the voice recorder in such a way that it was not distracting to participants. Based on the audio recordings, I was able to transcribe all discussions verbatim and capture the participants' actual words (McMillan & Schumacher, 2014; Chambers, 2012).

According to McMillan and Schumacher (2014), photographs are valuable for validation purposes, documentation and obtaining a visual record of accounts. A potential disadvantage however, as stated by Sullivan, Gibson and Riley (2012) is that photographs may not always be of high quality. In an attempt to counter this challenge, I used a camera with which I was familiar and took as many photographs as possible (See Appendix D). Another potential challenge of taking photographs concerns their ethical implications, as some participants may be recognisable in photographs, thereby jeopardising the principle of anonymity (Sullivan et al., 2012). To avoid this challenge, I obtained informed consent from the participants to take photographs of them, as well as of the sessions and of the different school-based vegetable gardens (Clark & Zimmer, 2001). All participants consented to this.

The posters compiled by the participants as part of the PRA-based activities, provided additional visual data, which enhanced my understanding of the central phenomenon under investigation (McMillan & Schumacher, 2014; Creswell, 2013). Photographs 3.8 to 3.10 provide examples of the posters that were compiled by the participants. Photograph 3.8 illustrates what the participants from School 1 regarded as essential ingredients of a sustainable school-based vegetable garden. Photograph 3.9 illustrates what participants from School 3 viewed as important challenges and tasks to be done during each season of the year. Photograph 3.10 shows what participants from School 4 regarded as factors that can contribute to the success and failure of a sustainable school-based vegetable garden.



Photograph 3.8: Photograph of poster compiled during the PRA-based workshop at School 1



Photograph 3.9: Photograph of poster compiled during the PRA-based workshop concerning seasons at School 3.

Photograph 3.10: Photograph of poster compiled during the PRA-based workshop at School 4.

3.5 DATA ANALYSIS AND INTERPRETATION

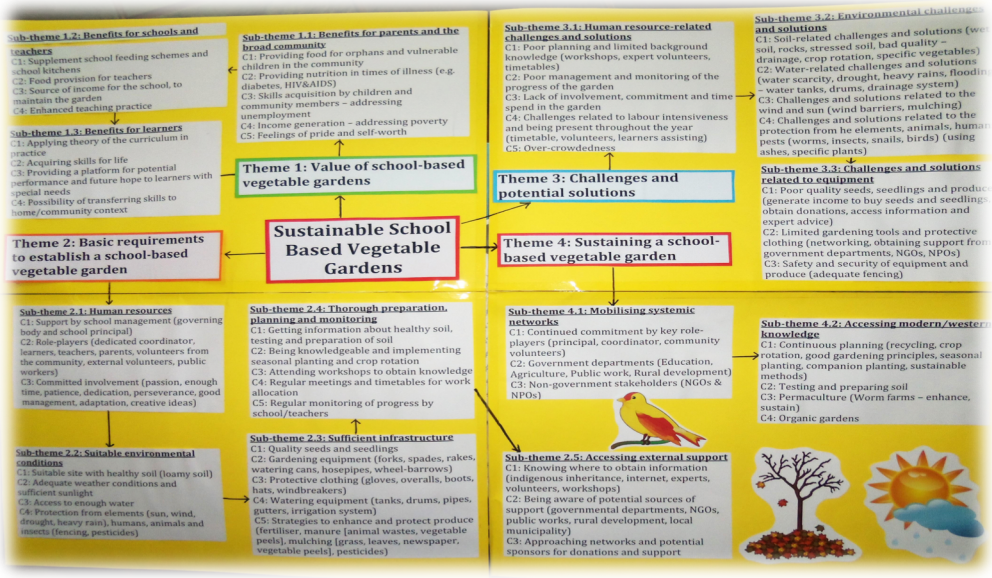
The purpose of qualitative data analysis is to provide a thick description of the processes, contexts, transactions and characteristics that determines the phenomenon under study (Geertz, 1974; Ponterotto, 2005). In a qualitative study, there is no clear indication where data generation stops and where analysis begins, as a gradual fading from one into the other occurs (Terre Blanche, Durrheim & Kelly, 2006). According to McMillan and Schumacher (2014), inductive data analysis implies a process where data is firstly organised into groupings, and then patterns are identified and relationships drawn among these groupings. As such, inductive analysis is a method used by qualitative researchers to make meaning of generated data (McMillan & Schumacher, 2014). This is done by starting off with specific data and then moving towards groups and patterns in order to develop general themes, allowing conclusions to emerge rather than forcing predisposed ideas onto the data (McMillan & Schumacher, 2014).

Ryan and Bernard (2000) introduce thematic coding as a process performed within analytic traditions, rather than an independent approach. Braun and Clarke (2006) however argue that thematic analysis can be considered as a method in its own right. As stated, thematic analysis aims to identify, analyse and report patterns and themes that emerge within data and can be used as a method to reflect reality, as well as to investigate what a certain reality represents (Braun & Clarke, 2006). A benefit of thematic analysis is its flexibility, making it a useful research tool that can provide rich, detailed and complex accounts of data (Braun & Clarke, 2006; Bless et al., 2013). Because inductive thematic analysis is done by a researcher who has his/her own views and perceptions, the analysis may however contain contradictions or over interpretations (Terre Blanche & Kelly, 2002). To counteract such occurrences, I engaged in constant reflection and discussions with my supervisor and co-supervisor while completing inductive thematic analysis.

For this purpose I followed certain steps (Braun & Clarke, 2006). I firstly familiarised myself with the generated data by looking at all the visual data (Creswell, 2009; Braun & Clarke, 2006) and reading the transcripts of discussions, my field notes and research diary (Terre Blanche & Durrheim, 2002). Secondly, I organised the data so that coding could be initiated (McMillan & Schumacher, 2014). Thirdly, I organised the data (McMillan & Schumacher, 2014; Clarke & Braun, 2013) into workable units based on my initial ideas, together with other sources such as the research questions, the data

itself and the guidance and input of my supervisors.

Next, I generated initial codes by noting corresponding and interesting features across the data sets and then ordering the data in terms of different codes (Braun & Clarke, 2006). Similar codes were put together to form categories, which were then named to describe each category (Braun & Clarke, 2006). This process of forming categories was recursive, which means that the codes and categories were constantly compared so that statements could be made about the relationships among the categories and patterns could emerge (Braun & Clarke, 2006). A pattern can be referred to as a relationship among categories (McMillan & Schumacher, 2014). While searching for patterns, I aimed to understand the multifaceted links that occurred amongst the various aspects of the generated data (McMillan & Schumacher, 2014). This circular process asked of me as researcher to constantly move back and forth between the data in order to validate every pattern in light of the larger idea (McMillan & Schumacher, 2014; Braun & Clarke, 2006). Photograph 3.11 provides a summary of the initial themes I identified based on the posters that were compiled by the participants.



Photograph 3.11: Compilation of data following the visit

3.6 QUALITY CRITERIA

Throughout I attempted to adhere to the criteria of credibility, transferability, confirmability, dependability and authenticity (Denzin & Lincoln, 2005; Lincoln & Guba, 1985; 1994). Various strategies were thus incorporated in order to enhance the trustworthiness of the study.

3.6.1 CREDIBILITY

According to Van der Riet and Durrheim (2008), credibility refers to the degree of soundness of the conclusions of a research study. To this end, Mays and Pope (2000) describe credibility as the degree of accuracy pertaining to a particular context or event and the assurance that the researchers' conclusions were drawn from the generated data. Van der Riet and Durrheim (2008) conclude that credibility is concerned with whether or not a research study produces findings that are believable and convincing.

Triangulation can enhance credibility, when one makes use of multiple data generation strategies (Creswell, 2013). During this study I applied triangulation in terms of data generation and data analysis (Creswell, 2013; Lincoln & Guba, 2007). To this end I included field notes and a research diary in addition to PRA-based workshops, an interview and observation, which served as a form of quality control (Mouton, 2001; Merriam, 1998). Triangulation gave me a departure point for crystallisation and with immersion into the data, and creativity, where I aimed to present a "more complete, holistic and authentic study…" (Janesick, 2001, p. 539). The various data generation strategies could thus be woven together, to connect the various parts, in the same way that one might weave together a quilt (Denzin & Lincoln, 2011; Lambotte & Meunier, 2013). I furthermore extracted thick descriptions from the transcribed data (Shenton, 2004), thereby relying on participants' exact responses (Thomas & Magilvy, 2011). Member checking enabled me to validate my findings by making sure that what I recorded were true representations of the participants' responses. This contributed accuracy (Wagner, Kawulich & Garner, 2012).

Through ongoing reflection and interaction with the data generation, analysis and interpretation process, I established a trail of evidence (Stewart & Gapp, 2014). During the research process I continually aimed to reflect on the data, question assumptions and learn from experience in order to build self-awareness (Ellingson, 2009). This allowed for crystallisation of the data, which enhanced trustworthiness and credibility. Ultimately, the aim was to crystallise findings and gain a deep understanding of the research in such a way to allow discovery of the findings as they emerged (Denzin & Lincoln, 2011; Stewart et al., 2017).

3.6.2 TRANSFERABILITY

Transferability is recognised as the manner in which a reader is able to take the findings of a study and transfer them to other contexts (Lincoln & Guba, 1985; Patton, 1990). Throughout the current study, I aimed to provide rich and detailed descriptions

of the data, in support of transferability. Even though the purpose of the research was not to relate the findings to other contexts, thick descriptions of the data and research process make the findings more transferable, and therefore applicable to similar settings (Seale, 1999). Generalisation of the findings was not my aim, based on the paradigmatic choices I made (Patton, 1990; Babbie & Mouton, 2001). As this study was conducted within a specific community, involving only selected community members who do not necessarily represent the total community, the findings cannot apply to the broader community.

3.6.3 DEPENDABILITY

According to Van der Riet and Durrheim (2008), dependability refers to the degree to which the results of a study are repeatable. In other words, dependability refers to the detail and traceability of documented data to ensure that similar findings may emerge if a study were to be repeated (Tobin & Begley, 2004; Lincoln & Guba, 1985; Babbie & Mouton, 2001). As this study is set within an interpretivist paradigm with a focus on subjective participant perception susceptible to change and dependent on individual experience, it is difficult to determine whether the same results would be obtained if the study were to be repeated (Van der Riet & Durrheim, 2008).

Dependability therefore does not only include the repeatability of results, but rather that the findings are a representation of what the researcher claims them to be (Van der Riet and Durrheim, 2008). In order to meet the criterion of dependability, I include extensive documentation of data, methods and decisions in this mini-dissertation (Merriam, 1998). I also include transcriptions of the PRA-based workshops and semi-structured interview for the readers to review (Wagner et al., 2012).

3.6.4 CONFIRMABILITY

According to Lincoln and Guba (1985), confirmability implies whether or not researcher bias can be ruled out in terms of the findings of a study. Morrow (2005) states that researchers engaging in qualitative research cannot be fully objective. As such, I relied on continuous reflection to remain aware of my personal bias. In addition, I was in constant discussion with my supervisors to ensure that biased interpretations were limited (Shenton, 2004).

According to Creswell (2013), confirmable findings are findings that are based on the data and can thus be related back to a data source, rather than to the researcher recording them. In my aim to enhance confirmability, I related my analysis and

interpretation of the data to existing literature, thereby enriching the findings. Transcriptions are valuable as findings can be traced back to the participants' exact words, and they provide an audit trail for the study (Richter & Jooste, 2013; Lincoln & Guba, 2007).

3.6.5 AUTHENTICITY

The criterion of authenticity refers to whether or not a wide variety of perspectives, views and beliefs of participants are provided by the researcher (Lincoln & Guba, 1985). Seale (1999) highlights the importance of correlating various sources of data. To this end, I include a range of different perspectives and contributions (Lincoln & Guba, 1985; Merriam, 1998; Seale, 1999) from the various data sources in Chapter 4, where I present the results I obtained. Lincoln and Guba (1994) advise researchers to consider multiple and conflicting voices, as well as differing and interacting interpretations, in order to facilitate triangulation and crystallisation, and enable the researcher to study multiple constructed realities (Lincoln & Guba, 1994). During the PRA-based workshops I took the necessary care to make sure that all participants had an opportunity to provide their input.

According to Tracy (2010), authenticity refers to a certain level of sincerity or transparency of the findings. This includes honesty in terms of the researchers' own bias and potential influence on the research in various areas of the process. Tracy (2010) concludes that self-reflexivity is an important strategy that can ensure that the researcher remains authentic throughout the research process. To work towards authenticity, I used a research diary to reflect on my ideas, perceptions, views and beliefs, in order to identify any biases that could influence the research.

3.7 ROLE OF THE RESEARCHER

According to Berg (2004), researchers conducting case study research, while applying PRA principles, stand alongside participants in the data generation process. Greenwood and Levin (2000) also emphasise this partnership between the researcher and the participants. Similarly, Maree and Van der Westhuizen (2007) conclude that the primary role of such researchers is to be in partnership with participants and generate data that may ultimately lead to new insight. Ebersöhn et al. (2007) states that this partnership implies a process of sharing power, but also, of sharing ownership.

At the start of this research it was important for me to clarify my role in the research process. According to McMillan and Schumacher (2001) the role of the researcher is

to be a sensitive observer. My identity as student psychologist could, however, potentially lead to confusion if participants felt that, as a psychologist, I ought to have supported them and provided advice or assistance (Sanjari, Bahramnezhad, Fomani, Shoghi & Cheraghi, 2014). To this end, I only assumed the role of researcher in this study in order to avoid any role confusion.

As a researcher, I was responsible for observations while co-conducting PRA-based workshops and an interview, as well as taking field notes, keeping a research diary, and making audio-recordings. Furthermore, I conducted member checking to ensure that I had made accurate interpretations of the information the participants had provided.

Throughout the research, I had to ensure that I viewed the participants as research partners, and through the lens of Interpretivism. It was my responsibility to ensure that I acted ethically at all times during the research (Sanjari et al., 2014). I also had to ensure that I remained reflexive in my approach and outlook (Clarke & Braun, 2013). Merriam (1998) states that a qualitative researcher is the main instrument in the data collection process and therefore, I had to ensure that I was well-prepared and familiar with all data generation strategies that were utilised at all times.

3.8 ETHICAL CONSIDERATIONS

According to Beauchamp and Childress (2001) certain ethical guidelines have to be adhered to in qualitative studies. These guidelines, as stipulated by the Ethics Committee of the University of Pretoria Faculty of Education (www.up.ac.za), were held as standard during the course of the research. These ethical guidelines include that written consent was obtained before the study commenced, that participants were informed of the details of the study and permission to conduct research was obtained from the Eastern Cape Department of Education prior to the study (See Appendix A), that autonomy and respect were upheld for the dignity of the participants involved in the study (privacy, voluntary consent, confidentiality and no harm to participants) (Macklin, 2002), that all recorded data (written and audio recorded) were dealt with as confidential, that non-malfeasance was applied (no harm or deception were present), that the research findings were reported in a balanced manner, and that beneficence and justice was continuously upheld (fair treatment and respect for the human dignity of participants) (Wassenaar, 2006).

3.8.1 INFORMED CONSENT

According to Wassenaar (2006), informed consent entails various components, and an individual cannot give consent unless these components are present. These components include that an individual needs to be provided with all relevant information of a study, that participants are competent and should understand what they are consenting to, that participants need to know that they're involvement is voluntary, and that that consent be formalised in writing (Wassenaar, 2006).

I obtained informed consent (McMillan & Schumacher, 2014) after explaining the purpose of the research to the participants and providing them with the option of changing their involvement in the study at any point. After consensus was reached that all participants understood what was stipulated in the consent form, they were required to sign the consent form (See Appendix B). Participants were also informed of the time frame and what their involvement in the research would entail (McMillan & Schumacher, 2014).

Informed consent was also obtained from participants to audio record all discussions and to take photographs of the sessions and the various school-based vegetable gardens. On the consent form, the option was included to have their faces shown on photographs. To this end, all participants indicated that they would like to have their photographs taken and gave permission for their faces to be visible in any publications following this study.

3.8.2 RESPECT FOR THE HUMAN NATURE OF PARTICIPANTS

Wassenaar (2006) states that every researcher has the responsibility to ensure that the human dignity of participants is not sacrificed or violated for the sake of science or for the advancement of knowledge and the success of a study. Wassenaar (2006) argues that researchers have a certain level of power in a research relationship with participants and that it is the duty of researchers not to abuse this.

According to McMillan and Schumacher (2014), respect for the human nature of participants entails that participants' identities remain confidential and that participants know that they have a choice in participating in research. Respect furthermore entails that some groups of participants do not get advantaged above others (Easter, Davis & Henderson, 2004). Molyneux, Peshu and Marsh (2005) highlight that researchers need to show sensitivity to the values and cultural traditions of the community in which participants live. In addition, Wassenaar (2006) emphasises that research should not

only be of value to the researcher, but also to participants, and elaborates on the idea that if one truly has respect for participants, one should view them as active contributors to research, who in effect have the right to have insight into the findings of a study in order to be empowered through the contributions they had given.

In order to ensure that the participants felt respected in this study, I explained all matters of confidentiality at the onset of the study, treated participants with respect, and ensured that all participants felt heard (McMillan & Schumacher, 2014). I also attempted to show respect to participants throughout our interaction and acted in an unbiased and non-judgmental manner. I pursued confidentiality (McMillan & Schumacher, 2014) by explaining to the participants what confidentiality entailed at the start of the study. I encouraged participants to see all group discussions as confidential settings, with the request that information was not to be shared with people outside of the group.

3.8.3 PRIVACY

According to Sanjari et al. (2014), confidentiality furthermore refers to the access that exists to the personal information of participants in a study. The Bill of Rights of the Constitution of the Republic of South Africa (1996) acknowledges that every individual has the right to privacy. In this regard, McMillan and Schumacher (2014) state that participants have the right for their privacy to be protected. In this study, participant's privacy was protected by restricting information containing participants' characteristics, responses and behaviours to the research team. I ensured privacy by attending to anonymity, confidentiality (see previous section) and the appropriate storing of data.

Respecting anonymity (McMillan & Schumacher, 2014) implies that data can not be linked to individual participants by name. Even though the participants in this study gave consent that their faces may be shown in publications, I still took the necessary steps to ensure that their names remained anonymous. Participants' names are thus not indicated in this mini-dissertation, and each participant was assigned a number. In terms of data storage, the generated data are to be stored in a secure location for fifteen years, as stipulated by the ethical guidelines for qualitative research. In addition to storing all written records in a locked closet, all electronic files are password protected (McMillan & Schumacher, 2014)

3.8.4 NO HARM OR RISK TO PARTICIPANTS

According to Wassenaar (2006), researchers are obliged to to carefully consider the risks or harmful factors that may negatively impact participants. Sanjari et al. (2014) acknowledge possible forms of psychological harm that need to be considered, for example, distress, embarrassment or damage to participants' reputation. Data generation for the current study was done at the participants' schools, which meant that participants did not have to make financial sacrifices in order to travel to the research site. As such, harm could be limited.

Not causing harm or risk to participants furthermore includes the revealing of harmful information, asking participants to answer personal questions that might bring about emotional reactions, or using deception to reach a goal (McMillan & Schumacher, 2014). The nature of the current research is not harmful in itself, and the study is not an experimental study. This decreased the possibility of harm to participants. Nevertheless, I made sure to not cause any harm to participants in any way and avoided to expose participants to any harmful situations or contexts (Sanjari et al., 2014). I also did not deceive the participants in any way.

3.9 CONCLUSION

In Chapter 3 I discussed the paradigmatic approaches that guided this study. I explained the selection of the research sites and participants, the data generation and documentation techniques, as well as the data analysis and interpretation procedures I utilised. I elaborated on measures that could have influenced the rigour of the study, namely credibility, transferability, dependability, confirmability, and authenticity. Finally, I elaborated on my role as researcher and discussed the ethical guidelines I followed, pertaining to informed consent, respect for participants, privacy and that no harm was inflicted.

In Chapter 4 I discuss the results and findings of the study. Results are presented according to the themes and sub-themes I identified during the process of inductive data analysis. I then compare the identified themes with existing literature and conclude the chapter by presenting the findings of the study.

CHAPTER 4

RESULTS AND RESEARCH FINDINGS

4.1 INTRODUCTION

In Chapter 3 I elaborated on the research process and explained the paradigmatic approaches, as well as the data generation and documentation strategies I utilised. Next, I described the data analysis and interpretation strategies I implemented. I also discussed the quality criteria and ethical considerations I adhered to during the study.

In this chapter, I report on the results of the study in terms of the two themes and related sub-themes I identified subsequent to inductive thematic analysis of the generated data. I include extracts from the data to strengthen my discussions. I then discuss the findings of the study by relating the results to existing literature, as presented in Chapter 2.

4.2 RESULTS OF THE STUDY

In this section I discuss the two main themes I identified, with related sub-themes. As an introduction, Table 4.1 provides an overview of the themes and sub-themes of the study.

Table 4.1: Overview of themes and sub-themes

THEMES	SUB-THEMES
Theme 1: **Value of school-based vegetable gardens**	**Sub-theme 1.1: Providing food and nutrition** **Sub-theme 1.2: Skills acquisition** **Sub-theme 1.3: Practical application of the curriculum**
Theme 2: **Sustaining school-based vegetable gardens**	**Sub-theme 2.1: Mobilising human resources** **Sub-theme 2.2: Attending to environmental conditions** **Sub-theme 2.3: Establishing the required infrastructure** **Sub-theme 2.4: Accessing and enhancing knowledge** **Sub-theme 2.5: Continued planning and monitoring**

4.3 THEME 1: VALUE OF SCHOOL-BASED VEGETABLE GARDENS

This theme captures the participants' views on the value of school-based vegetable gardens. Three sub-themes were identified that relate to food and nutrition provision, skills acquisition and learners' practical application of the curriculum. Table 4.2 provides an overview of the criteria I used to identify the relevant sub-themes.

Table 4.2: Inclusion and exclusion criteria for Theme 1

IDENTIFIED SUB-THEMES	INCLUSION CRITERIA	EXCLUSION CRITERIA
Sub-theme 1.1: Providing food and nutrition	Any reference to school-based vegetable gardens being a source of food and nutrition to learners and community members	Contributions that foreground skills acquisition and the application of the curriculum as core value of school-based vegetable gardens.
Sub-theme 1.2: Skills acquisition	Any reference to the value of skills acquisition by learners and community members as a result of their involvement in the school-based vegetable garden.	Contributions indicating food and nutrition provision or the practical application of the curriculum as core value of school-based vegetable gardens.
Sub-theme 1.3: Practical application of the curriculum	Any reference to the practical application of the curriculum by learners when involved in school-based vegetable garden projects.	Contributions reflecting food and nutrition provision and skills acquisition as primary value of school-based vegetable gardens

4.3.1 Sub-theme 1.1: Providing food and nutrition

During the PRA-based workshops, participants indicated that school-based vegetable gardens could provide food and nutrition to learners and community members. In this regard, a participant from School 1 elaborated on the reason for them starting their school-based vegetable garden. She indicated: *"The learners come to school without any food, so we decided to start a vegetable garden because we were not getting money from the government"* (Semi-structured interview, School 1, Participant 7). Reflecting on my observations of the positive outcomes of school-based vegetable gardens, I noted the following: *"A positive thing from School 1 was that they gave some of the produce to the learners to take home to their families. In a way some of the participants seemed to see this as a way of taking care of those in need in their community"* (Research diary, School 1, 7 August 2015).

Participants from School 2 similarly mentioned that their school provides food (also from the vegetable garden) to vulnerable learners and their families (Field notes, School 2, 7 August 2015). I wrote the following in my research diary in terms of the potential value of such efforts: *"This (taking produce home) may help battle the intense*

poverty experienced by community members" (Research diary, School 5, 12 October 2015). Closely related, participants from School 5 commented that the produce of school-based vegetable gardens can be donated to unemployed community members (Field notes, School 5, 12 October 2015). A participant from School 5 explained this: *"Our government said, people must do things with their own hands, so the garden was the key thing for people to have something to eat"* (PRA-based workshop, School 5, Participant 1).

Participants furthermore described school-based vegetable gardens as a potential source that can supplement vulnerable learners' food intake. In this regard, a participant from School 4 said: *"We feed the orphans and vulnerable people in the community and some of them are the students here, so firstly to feed the children"* (PRA-based workshop, School 4, Participant 2). The same participant added: *"There are so many orphans and most of them are aids-related"* (PRA-based workshop, School 4, Participant 2). In support of this possibility, participants from School 2 were of the opinion that the produce of school-based vegetable gardens can benefit sick learners and support their nutritional well-being. One of the participants reported that: *"We've got sick learners. Even with everything that we've got, it's not enough. You can even look at the nutrition that the children get, it's little bit"* (PRA-based workshop, School 2, Participant 4). Participants from School 3 expressed similar views and indicated that the school can send the produce to the homes of sick learners. A participant explained: *"If there is a child that is sick, because some of our children have TB, we try to send veggies home for that child"* (PRA-based workshop, School 3, Participant 2). Similarly, participants from School 5 indicated that the vegetables from their garden are donated to sick people, old age homes and unemployed community members (Field notes, School 5, 12 October 2015).

In addition to food and nutrition provision, participants emphasised that fresh vegetables are also used to supplement the school feeding schemes and soup kitchens. A participant from School 3 for example commented that: *"We were supplementing the school nutritional programme to have something fresh like onion and spinach in the kitchen"* (PRA-based workshop, School 3, Participant 5). Closely related, a participant from School 4 added: *"(We used it) to supplement our soup kitchen here with natural, organic veggies for healthier food for the kids because a healthier body (creates) a healthy mind"* (PRA-based workshop, School 4, Participant 1). Another participant from School 4 furthermore commented that: *"Another way to*

support the community is to have a soup kitchen, where the mama's can make soup and people can queue up and get some soup" (PRA-based workshop, School 4, Participant 2).

4.3.2 Sub-theme 1.2: Skills acquisition

Participants evidently viewed school-based vegetable gardens as a platform for skills acquisition by children and even their parents, which can eventually lead to increased availability of healthy food choices, income generation and being agriculturally skilled. A participant from School 4 said: *"The main idea behind the vegetable garden was to teach the kids a skill, if you can teach them to plant they will never ever starve"* (PRA-based workshop, School 4, Participant 1). Similarly, a participant from School 1 mentioned that: *"We decided that we must start a garden for the learners and for their parents, so we decided to give the learners the skill of doing gardening and also their parents and that's where we get food, we get food from the garden"* (Semi-structured interview, School 1, Participant 7).

As such, participants seemingly regarded vegetable gardening as a way to support schools and community members to not only grow healthier food for themselves, but to also generate an income. A participant from School 2 explained this possibility as follows: *"They (the parents) did not get paid for that (working in the garden), they had to sell it (vegetables), because in the community, people are unemployed, which is the challenge"* (PRA-based workshop, School 2, Participant 3). In support of this claim, I noted the following in my research diary: *"At this school, members of the community had the opportunity to practice their gardening skills in such a way that they use this as a means of generating an income"* (Research diary, School 5, 12 October 2015) as well as: "*This garden was purely started as an initiative for struggling community members to utilise the open space of the school to plant food for themselves and to generate income"* (Research diary, School 2, 7 August 2015). A participant from School 2 added that*: "Unemployed parents had their own plots where they could grow things for their houses"* (PRA-based workshop, School 2, Participant 2). To this end, photograph 4.1 indicates that school-based vegetable gardens can be utilised by community members in order to generate an income.

Photograph 4.1: Plot's being utilised by community members to plant their own vegetables at School 5

Finally, participants shared the belief that vegetable gardening can foster the necessary life skills that can eventually allow people to obtain an income, especially for learners who experience barriers to learning. A participant from School 2 mentioned that: *"Even on agriculture and life skill, some of them didn't do well in class, but in the vegetable garden they do well"* (PRA-based workshop, School 2, Participant 3). Similarly, a participant from School 1 explained how school-based vegetable gardens could allow for skills development and a potential income: *"Some of the learners who have a learning problem, so that they can do something when they go out from the school they get some skill"* (Semi-structured interview, School 1, Participant 3).

4.4.3 Sub-theme 1.3: Practical application of the curriculum

Participants seemingly viewed school-based vegetable gardens as valuable for learners in that gardens provide a platform, which can be utilised to enhance the curriculum for learners by incorporating vegetable garden activities in various learning areas. A participant from School 1 for example explained how a school-based vegetable garden could enhance learners' knowledge and skills in Science and Technology. This participant said:

> *"Learners do go to the garden as part of their learning, for instance in grade 4 at the beginning of the year for a practical task, they do the germination of a seed. So they have to go to the garden and they have to know the types of leaves, because eh vegetables have different types of leaves, so they have to be able to differentiate. This vegetable is this type of leaf and so on, so they do go to the garden for various reasons because we try to plant everything for the children to get exposure"* (PRA-based workshop, School 1, Participant 6).

The participant continued by saying: *"Yesterday there was a class there in the garden, they were teaching them about the soil"* (PRA-based workshop, School 1, Participant 6). In support of this example and broadening the possibilities, a participant from School 4 added: *"She (a teacher) has planted many different things, fruit trees and nuts and medicinal plants that can be linked to all subjects"* (PRA-based workshop, School 4, Participant 1).

Participants from School 4 furthermore communicated that vegetable gardens can be extended to learning areas not conventionally associated with school-based vegetable gardens. They indicated that: *"For the Gr R's you must see them, we were doing something about vegetables in the class and then we took the cabbage we took the carrots and cut it and painted, it was fun! And they are learning to identify things they didn't know"* (PRA-based workshop, School 4, Participant 3), and added: *"Our garden is a textile garden where children can play in it, like a playground and we want to link it to art and sport"* (PRA-based workshop, School 4, Participant 1). As such, participants from School 4 seemingly proposed that the school-based vegetable garden should be an enjoyable experience for learners.

For some participants, learning can be extended beyond the school environment and include practical homework activities based on vegetable garden activities at school. A participant from School 3 explained: *"We give them seeds to take home, for them to learn"* (PRA-based workshop, School 3, Participant 2), and a participant from School 4 added: *"We want our kids to take this and grow it at home. Everything is linked to the garden"* (PRA-based workshop, School 4, Participant 1). Participants from School 3 added the possibility of utilising school-based vegetable gardens to raise awareness on environmental issues, saying: *"We have got an environmental club. We have things they (learners) are involved in"* (PRA-based workshop, School 3, Participant 2).

On the contrary, participants from School 2 however shared their view that learner involvement in school-based vegetable gardens are too time intensive and take too much effort. One participant seemingly experienced it as challenging when making the vegetable garden part of lessons, in terms of management and the time required for such activities (Field Notes, School 2, 7 August 2015). School 5 similarly commented that the learners in their school are not involved in the school's vegetable garden (Field notes, School 5, 12 October 2015). As a result, they did not comment on the potential value of applying the curriculum in school-based vegetable gardens.

Some participants indicated that school-based vegetable gardens, as potential practical tool for applying the curriculum, allowed teachers to teach learners additional skills too, that could benefit them later in life. Participants from School 2 explained:

> *"We teach them (the learners), it's easy for them, some of them they do watering, but you have to teach them as educators. When the seed starts to grow you have to use watering cans, you understand, they must know from the start how to plant seeds. This is where the teachers come in to teach the learners; even the parents come in to teach the learners, so that at the end of the day even if you are not there, they will be able to help themselves. And another thing, if we have a school garden we are teaching the children a skill, they will carry their lifelong"* (PRA-based workshop, School 2, Participant 1).

Closely related, participants from School 3 commented on the practical application value of school-based vegetable gardens in teaching learners about careers that may support them in their future. The following contribution captures this view:

> *"Even for our learners now to get exposure of the career, because we invite different departments, so we don't start our career guidance in high school here, we start it in lower grades. We try to plant everything because; it's the way of showing the children what can grow, because we don't know the end. What are they going to be scientists or agriculturalists"* (PRA-based workshop, School 3, Participant 2).

In confirmation of this view, I noted the following in my research diary: "*What was notable was that they valued the garden, not only for its aesthetic features, but for the opportunities it provides for learners to learn skills in planting and gardening so they can do something with it after school"* (Research diary, School 3, 1 October 2017).

4.4 THEME 2: SUSTAINING A SCHOOL-BASED VEGETABLE GARDEN

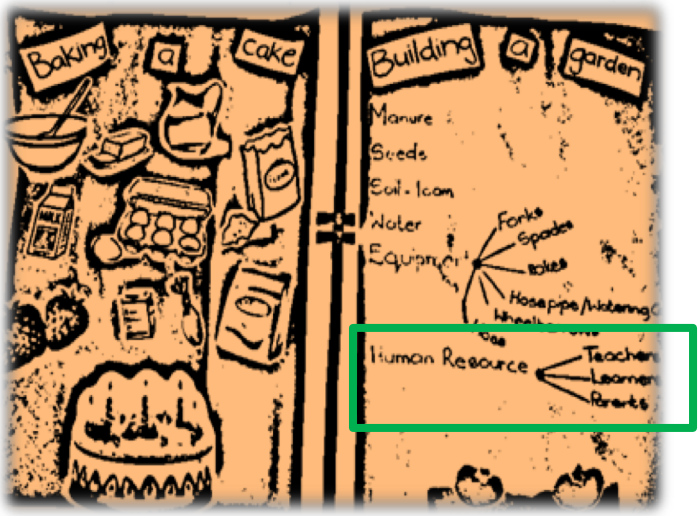
Theme 2 captures the participants' views on sustaining a school-based vegetable garden. This theme comprises of five sub-themes that relate to the mobilisation of human resources, attending to environmental conditions, establishing the required infrastructure, accessing and enhancing knowledge, and ensuring continued planning and monitoring. Table 4.3 captures the inclusion and exclusion criteria that apply to Theme 2.

Table 4.3: Inclusion and exclusion criteria for Theme 2

IDENTIFIED SUB-THEMES	INCLUSION CRITERIA	EXCLUSION CRITERIA
Sub-theme 2.1: **Mobilising human resources**	Any reference to human resources as determining factor for sustaining a school-based vegetable garden	Contributions focusing on environmental conditions, infrastructure, knowledge, or continuous planning and monitoring as important factors for sustaining a school-based vegetable garden
Sub-theme 2.2: **Attending to environmental conditions**	Any reference to attending to environmental conditions and challenges in order to sustain a school-based vegetable garden	Contributions that foreground the mobilisation of human resources, infrastructure, the accessing of knowledge, or continuous planning and monitoring as significant factors for sustaining a school-based vegetable garden
Sub-theme 2.3: **Establishing the required infrastructure**	Any reference to the required infrastructure as underlying to sustaining a school-based vegetable garden	Contributions focusing on the mobilising of human resources, infrastructure, the accessing of knowledge, or continuous planning and monitoring as important factors for sustaining a school-based vegetable garden
Sub-theme 2.4 **Accessing and enhancing knowledge**	Any reference to accessing and enhancing knowledge in order to sustain a school-based vegetable garden	Contributions indicating the mobilisation of human resources, environmental conditions, establishment of infrastructure or continuous planning and monitoring as essential factors for sustaining a school-based vegetable garden
Sub-theme 2.5 **Continuous planning and monitoring**	Any reference to the importance of continuous planning and monitoring in sustaining a school-based vegetable garden	Contributions focusing on mobilising human resources, environmental conditions, infrastructure or accessing knowledge as important factors for sustaining a school-based vegetable garden

4.4.1 Sub-theme 2.1: Mobilising human resources

Participants indicated that successful school-based vegetable gardens require input from different groups of individuals. They namely mentioned teachers, learners, parents, volunteers, community members and other stakeholders as potential role-players that may offer their services to maintain a school-based vegetable garden. A participant from School 3 summarised this idea in the following words: *"To be productive we need manpower first"* (PRA-based workshop, School 3, Participant 1). Similarly, a participant from School 1 said: *"Manpower that is learners, parents and also teachers"* (PRA-based workshop, School 1, Participant 1), as well as: *"people involved, volunteers and stakeholders*" (PRA-based workshop, School 1, Participant 3). Participants from School 2 agreed and emphasised learners, teachers and parents as important role-players in sustaining school-based vegetable gardens (Field notes, School 2, 7 August 2015). Photograph 4.2 provides an indication of teachers, learners and parents as important human resources.



Photograph 4.2: Identification of teachers, learners and parents as important human resources

Participants seemingly agreed that continuous support from the school management team can support the establishment of a sustainable school-based vegetable garden. One of the participants mentioned the example of: *"The school principal gave money for seeds"* (PRA-based workshop, School 1, Participant 4). Similarly, a participant from School 4 said: "*The idea for the vegetable garden was …'s (the principal) and we asked her what she needs and she said a vegetable garden"* (PRA-based workshop, School 4, Participant 1). Another participant from School 1 explained that their principal organised donations in support of their school-based vegetable garden. This

participant said: *"She is very positive, but she is a very busy person, otherwise she is very passionate about it, she likes to be hands on, on it"* (Semi-structured interview, School 1, Participant 3). As such, support by school management teams seems important for sustaining school-based vegetable gardens.

Participants furthermore indicated the Department of Basic Education and Rural Development as resources that can be mobilised in order to sustain their school-based vegetable gardens. In this regard, participants from School 3 stated: *"We get seeds from* [DBE]*, Rural Development, the Municipality, as well as Food and Trees"* (PRA-based workshop, School 3, Participant 2). Similarly, participants from School 2 reported that the municipality had provided seeds to their school (Field notes, School 2, 12 October 2017). A participant from School 1 mentioned how support by external resources has resulted in the establishment of their school-based vegetable garden, saying: *"An NGO and the school principal gave money for the seeds"* (PRA-based workshop, School 1, Participant 4). A participant from School 3 added:

> *"The department, organisation, rural development, correctional service also… those people who are on parole they come and help us with the cleaning so it is also to help them to get back into the community and to be accepted by the community. The NGOs they can also assist us, like we've got a tunnel and sometimes we run out of soil and they buy all the things for us"* (PRA-based workshop, School 3, Participant 3).

Participants from School 5 accentuated the importance of volunteers for maintaining a school-based vegetable garden (Field notes, Schools 1, 4 & 5, 12 October 2015). A participant from School 1 shared a similar view and stated the following: *"We had two volunteers in the garden, two parents who were very passionate about gardening"* (Semi-structured interview, School 1, Participant 3). On the other hand, in terms of the potential role of learners, participants from two of the five schools mentioned that *"the garden didn't work when learners were involved"* (Field notes, School 2, 12 October 2017), and that learners in their schools are therefore not involved in any gardening activities (Field notes, School 5, 12 October 2017).

In addition to identifying key role-players that can support the sustainability of school-based vegetable gardens, participants emphasised the importance of dedication by these role-players as key to success. They seemingly believed that committed involvement is of high importance as captured in the contribution of a participant from School 1, who said: *"We must love what we are doing. (The) garden needs someone who loves it. You must have passion"* (PRA-based workshop, School 1, Participant 1). Similarly, a participant from School 3 mentioned: *"You can have everything but if you*

are not passionate about what you are doing it's gonna take you nowhere. And the other (thing) is commitment" (PRA-based workshop, School 3, Participant 2). School 1 also emphasised that excitement is important and one participant said: *"They are all excited about the gardens. They are hands on"* (Semi-structured interview, School 1, Participant 7). Another participant from the same school summarised this idea as follows: *"What makes our garden nice is dedication first. You need to be there at your garden everyday, to see what's wrong, what's good, and then you make it right"* (PRA-based workshop, School 3, Participant 1).

Despite teachers being motivated and dedicated, participants indicated that their continuous contributions might be hampered due to time constraints and other responsibilities. According to the participants, teachers firstly need to attend their classes and other school-related responsibilities, which may imply that school-based vegetable garden activities may not always be priority. A participant from School 3 explained this challenge they experienced: *"We have extramural activities and you have to be present in the class. You have to make time really because one week you are absent in that garden, you go there and everything is a mess"* (PRA-based workshop, School 3, Participant 2). In addition to time, another challenge in optimally utilising human resources for sustainability, includes the availability of key role-players. During school holiday times, teachers and learners (human resources) do not attend school, which means that continued involvement in sustaining school-based vegetable gardens throughout the year is not possible. A participant from School 3 explained this challenge as follows: *"Even on the weekends, we are not here and the learners are not here, so when the community is not here no one is going to water our garden"* (PRA-based workshop, School 3, Participant 1). As such, in the case of a school not involving role-players that are available throughout and have access to the school grounds, the sustainability of school-based vegetable gardens can be challenging.

Finally, participants were reportedly also of the opinion that establishing and maintaining a school-based vegetable garden is labour intensive and that sufficient involvement of individuals can be challenging. According to a participant from School 1, the success of a school-based vegetable garden is dependent on the involvement of individuals. This participant said: *"If we don't go to the garden at the time-table that we have, that will not go right, we will be having a problem"* (PRA-based workshop, School 1, Participant 1). A participant from School 2 added: *"The parents are reluctant. After the harvest, they are lazy to start, the garden afresh"* (PRA-based workshop,

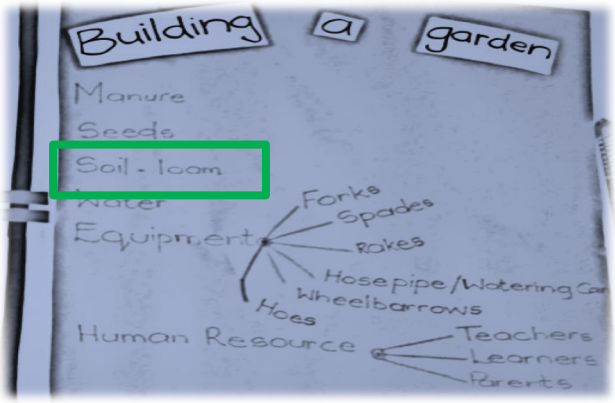
School 2, Participant 1). In support, a participant from School 4 stated: *"You need workers. It is not easy to maintain the garden"* (PRA-based workshop, School 4, Participant 1). Similarly, a participant from School 2 replied: *"So it failed, because the school didn't support, didn't know how to maintain a vegetable garden"* (PRA-based workshop, School 2, Participant 3). On the opposite side of the spectrum however, some participants had the view that too many individuals involved in a school-based vegetable garden can also be challenging. In this regard, a participant from School 2 stated: *"When they are working there, there is too many people and there is no progress"* (PRA-based workshop, School 2, Participant 2). Participants from Schools 1, 3, 4 and 5 however, did not comment on this perception.

4.4.2 Sub-theme 2.2: Attending to environmental conditions

Participants offered the view that school-based vegetable gardens depend on favourable environmental factors for success and sustainability. One of the aspects they mentioned relates to location and finding a suitable area to start a garden. A participant from School 1 stated: *"You must look for the plot first and you must not only look for the space, but for the direction of the sun, where it is coming a lot or where it is coming lesser because sun sometimes is damaging the plants"* (PRA-based workshop, School 1, Participant 2). Participants from School 2 agreed, and indicated that a suitable location is regarded as: *"a plot with enough sun, but not too much"* (Field notes, School 1, 7 August 2015). Other participants added: "A *site with not too much sun or wind"* (Field notes, school 3, 1 October 2015). Participants from School 4 agreed that sun and shade were important factors to consider in attempting to sustain a vegetable garden (Field notes, School 4, 1 October, 2015).

Participants identified the soil of a school-based vegetable garden as another important factor to consider, as it will influence the quality and success of the produce of a garden. Participants from Schools 1, 3 and 5 namely commented that suitable soil is required to establish a sustainable school-based vegetable garden. Participants seemingly agreed that the right type of soil can create the necessary habitat for crops to grow successfully, but can also present challenges if the soil is for example not of good quality or prepared correctly. One of the participants from School 4 commented: *"you need good quality soil for the plants to grow in, if it's not good, bugs come in and there's decay"* (PRA-based workshop, School 4, Participant 1). Another participant from School 4 emphasised that: "*you have to upgrade your soil and for that you need compost, mulch, irrigation, minerals, soil textures…"* (PRA-based workshop, School 4,

Participant 1). Similarly, participants from School 2 mentioned that the preparation of soil might pose some challenges (Field notes, School 2, 1 October 2015). Photograph 4.3 captures the participants from School 2's view that loam soil is a requirement for successful crops.



Photograph 4.3: Participants from School 2 indicates that loam soil is a requirement for a sustainable school-based vegetable garden

Participants realised that weather conditions such as sun, rain and wind will have an influence on the success of a school-based vegetable garden, and commented: *"And weather, if we've got good weather, then our garden will also be ok. Like (she) said, if our garden is on this side in the morning where the sun is there, our garden will be ok. And also not a lot of wind"* (PRA-based workshop, School 3, Participant 1). Similarly, School 5 highlighted the importance of favourable weather conditions (Field notes, School 5, 12 August 2015). In addition, participants from School 1 referred to sufficient sun as requirement to ensure a sustainable school-based vegetable garden (Field notes, School 1, 7 August 2015).

Participants seemingly perceived enough water as a necessity for a school-based vegetable garden. A participant from School 3 explained: *"Water is number one. When your garden is having lots of water, those plants that need lots of water"* (PRA-based workshop, School 3, Participant.1). Similarly, participants from Schools 1, 2 and 5 commented that water is an important requirement for a successful and sustainable school-based vegetable garden (Field notes, Schools 1, 2 & 5, 7 August & 12 August 2015). I noted the following in my research diary: *"The school seems to have adequate water and if they struggle to have water, they make a plan to get water as they know it is an important source"* (Research diary, School 3, 1 October 2015). Another participant from School 3 indicated ways to obtain water: *"Teachers (use) also…it was*

rainwater much of the time" (PRA-based workshop, School 3, Participant 2). Closely related, a participant from school 3 reported: *"Fortunately we had very wet weather, some other years it can be just dry"* (PRA-based workshop, School 3, Participant 2).

In terms of rain, a participant from School 5 explained that too much rain poses challenges (Field notes, School 5, 12 August 2015). Similarly, a participant from School 3 commented: "*The challenges is weather, climate change, like this year we've got a lot of rain in PE that makes us not go into out garden every day"* (PRA-based workshop, School 3, Participant 1). As such, too much rain seemingly prevent people from working in the garden, in addition to other implied challenges, such as flooding that may occur. In this regard, a participant from School 1 said: *"Our school it is flooding, and especially that area, there is a lot of flooding there, you cannot even do anything there so we cannot even do gardening for that period"* (Semi-structured interview, School 1, Participant 3). Another participant from School 1 elaborated on the effect that too much water may have on crops. She explained: *"A problem that we have with the tomatoes is they tend to be very small. We just guess that a problem here could be that we are giving it too much water or that the soil is very wet by this time, because it is spring time, because what we experience is heavy rains"* (PRA based workshop transcription, School 1, Participant 1). A solution to flooding was shared by another participant from School 1, who stated:

> *"We also have this thing between the blocks…I don't know what they do, they call it…it was also sponsored by somebody but I don't remember who was it and it was done for flooding, because it floods a lot there so they have built a route thing to take the water from the soil and the water is transferred from the tank to that thing"* (Semi-structured interview, School 1, Participant 2).

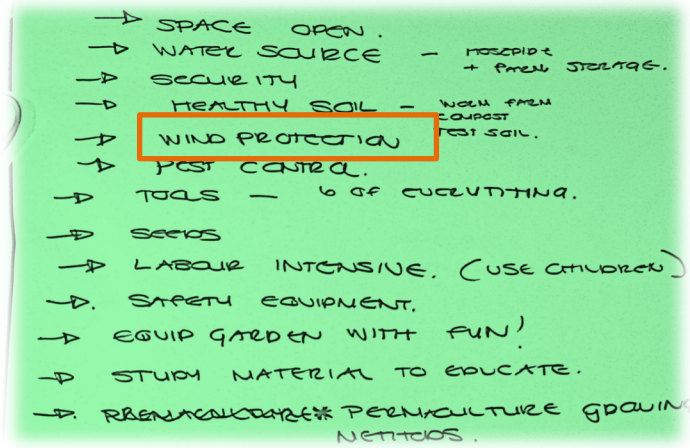
Participants from one of the schools indicated some additional challenges in terms of obtaining sufficient water, such as storing water and having financial means to obtain water. This participant said: *"Our challenge, we use watering cans, because we are saving the water. You must pay for the service charges"* (PRA based workshop, School 1, Participant 3). As solution to this challenge of water scarcity certain periods of the year, a participant from School 2 stated: *"Fortunately here at school we have that tank, the big tank, water from the rain that will help us when we run dry, you see or when the water is scarce"* (PRA based workshop, School 2, Participant 2)**.** A participant from School 5 similarly commented: *"You need the Jojo tanks, so that you can keep your water, so that when you want to water the garden...so you can go to the tank and pour it"* (PRA based workshop, School 5, Participant 1). As such, it appeared as if several

schools realised the potential challenge of holding sufficient water and had come up with plans to avoid this.

In terms of other weather conditions, participants indicated that elements, such as the wind, might influence the success of a school-based vegetable garden, more specifically if these conditions are unfavourable. A participant from School 3 explained:

> *"The bad one is the wind in PE. You can have a beautiful garden, but if the wind blows in the afternoon, forget it, you will see the leaves of your spinach all brown, as if somebody was burning your garden. PE is a windy city some school you might see they are not working hard, because the site it gets blown away"* (PRA-based workshop, School 3, Participant 2).

Another participant mentioned: *"Their need for windbreakers and shelter from the wind"* (Field notes, School 4, 1 October 2015). In support, I noted the following in my research diary: *"The school even has a small tunnel of which they are so proud. The tunnel serves the purpose of protection from the sun, pests and the wind"* (Research diary, School 3, 1 October 2015). In further confirmation, Photograph 4.4 shows participants' view that wind protection is important for a sustainable school-based vegetable garden.



Photograph 4.4: Suitable environmental conditions as basic requirement to a sustainable school-based vegetable garden (School 4)

Besides weather conditions, participants referred to insects, other animals and theft by community members as other factors, which may impact on the success of a school-based vegetable garden. In this regard, participants from School 4 said: *"Security is needed"* (PRA-based posters, School 4). A participant from School 1 similarly commented that protection of plants are required and added: *"Fencing for the dogs who's running around"* (PRA-based workshop, School 1, Participant 1). Closely

related, another participant from School 1 spoke about protection against insects and emphasised: *"And pesticides, organics to control the pests. We must have insect killers, maybe in the garden*" (PRA-based workshop, School 1, Participant 4). In terms of fencing, participants from School 2 explained: *"Another thing that makes challenges is the fencing, there is no fencing and the people are making trouble and even the animals are making troubles. Another thing they steal amongst each other, the neighbors come over, if your garden is not protected, they come over and steal"* (PRA-based workshop, School 2, Participant 1). It follows that the participants seemed informed about environmental conditions that may support a school-based vegetable garden and attended to these, yet also experienced certain challenges in this regard.

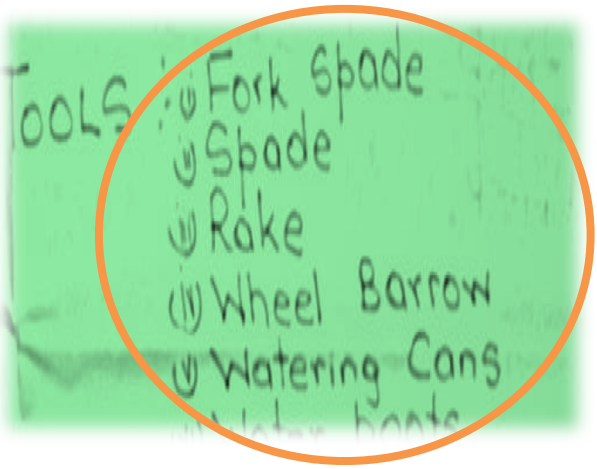
4.4.3 Sub-theme 2.3: Sufficient infrastructure

Sufficient infrastructure is another seemingly important requirement to establish a sustainable school-based vegetable garden, according to the participants. Concerning external resources in support of a sustainable school-based vegetable garden, participants emphasised that schools cannot merely rely on donations, but also need to utilise what they have available. A participant from School 4 argued as follows: "*Remember that gardens don't cost money, you can make everything on your own, you can use drain water from the township, make your own seeds, you can trade seeds and food and that's important to remember"* (PRA-based workshop, School 4, Participant 3). In support of this idea, I noted the following in my research diary: *"Even though they made use of external resources, they did not depend on these"* (Research diary, School 3, 1 October 2015).

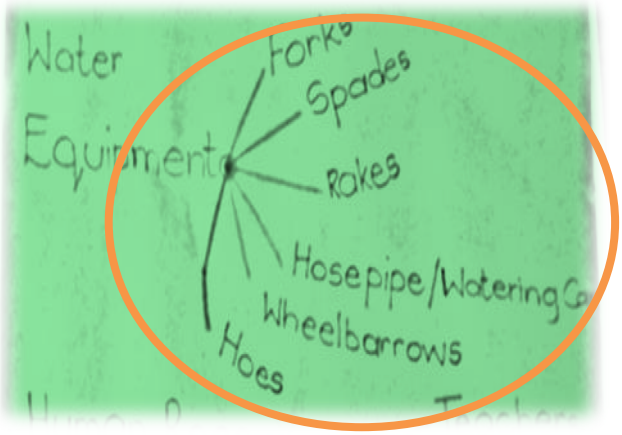
Participants from all five schools seemingly agreed that certain gardening equipment are required to establish a sustainable school-based vegetable garden (Field notes, School 1, 3, 4 & 5; 7 August 2015, 1 October 2015 & 12 October 2015). In this regard, a participant from School 2 said: *"The school must have equipment, because there is nothing we can do without equipment"* (PRA-based workshop, School 2, Participant 1)**.** Another participant from School 1 agreed and stated: *"I should think that if we can have more tools in our garden, we can work and we can build our garden successfully"* (PRA-based workshop, School 1, Participant 1)**.**

In elaborating on this perception, participants from School 1 specified a list of preferred gardening equipment that schools require, namely: *"A spade, fork, rake and watering can*" (PRA-based workshop, School 1, Participant 3)**.** Schools 2 and 5 specified the same gardening equipment (Field notes, Schools 2 & 5; 1 October 2015 &12 October

2015). In addition, participants from School 2 also included a hosepipe and wheelbarrow in their list. These participants said: *"Hosepipe and wheelbarrows, because, we need those"* (PRA-based workshop, School 2, Participant 1). Participants from School 1, similarly added a wheelbarrow to their list (PRA-based poster, School 1). Additional gardening equipment that were mentioned as valuable include, a wheat eater and a tractor for larger gardens (Field notes, School 5, 12 October 2015). In contrast with the views of Schools 1, 2, 3 and 5, participants from School 4 reported that: *"Sometimes we work with no tools"* (PRA-based workshop, School 4, Participant 2). Photographs 4.5 and 4.6 capture the required gardening equipment stipulated by the participants during the PRA-based workshops.



Photograph 4.5: Tools as basic requirement for a sustainable school-based vegetable garden



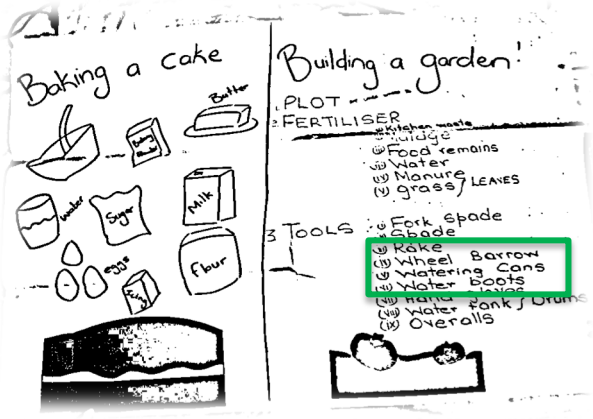
Photograph 4.6: Participants from School 2 see tools as a necessary requirement for a sustainable school-

In addition to gardening equipment, when brainstorming basic requirements, participants referred to the requirements for workers who manage the garden. They shared the view that workers in gardens need protective clothing in order to protect their every-day clothes. In this regard, participants from School 1 communicated that protective clothing is specifically required to prevent other clothes from getting ruined. They said: *"Gloves and overalls… we can also have clothing to wear when you are working in the garden so that you do not ruin yours. You need safety shoes… we don't have, we use plastics… we need them"* (PRA-based workshop, School 1, Participant 2). Participants from both Schools 1 and 5 mentioned that gloves are important when working in a school-based vegetable garden (Field notes, Schools 1 & 5, 7 August 2015 & 12 October 2015). Participants from School 1 added overalls, hats and boots (Field notes, School 1, 7 August 2015), while School 5 similarly mentioned straw hats

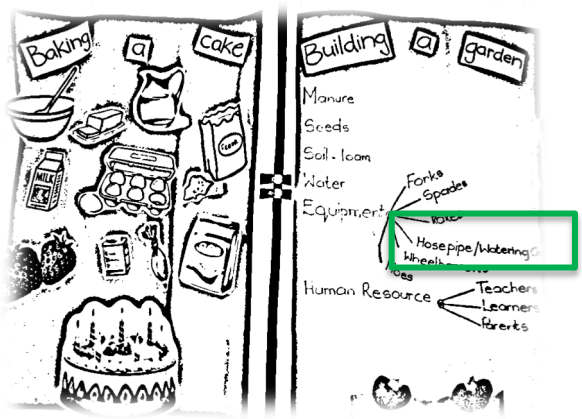
and safety shoes (Field notes, School 5, 12 October 2015). Overall, participants from Schools 2, 3 and 4 did not comment on the importance of protective clothing.

Next, participants shared the view that the type of seeds used in a school-based vegetable garden will determine the quality of the crops that are produced. Participants from all five schools mentioned that seeds and seedlings are a basic requirement (Field notes, School 1, 2, 3, 4 & 5, 1 October 2015 & 12 October 2015). In this regard, I noted the following in my research diary: *"They also have a small section where they grow their own little seedlings"* (Research diary, School 4, 1 October, 2015), indicating how School 4 attempted to ensure that this requirement is met.

Good irrigation was identified by the participants as yet another basic requirement to establish a successful and sustainable school-based vegetable garden. Participants from Schools 1 and 4 seemingly agreed about the importance of this (Field notes, Schools 1 & 4, 7 August 2015 & 1 October 2015). More specifically, participants agreed that water tanks or drums could be useful to regularly irrigate a vegetable garden. Participants from all schools besides Schools 3 agreed that water tanks is an important requirement to establish a school-based vegetable garden (Field notes, School 1, 2, 4 & 5, 7 August 2015, 1 October 2015 & 12 October 2015). A participant from School 2 indicated the value of such tanks based on what they experienced saying: *"Fortunately here at school we have that tank, the big tank, water from the rain that will help us when we run dry, you see or when the water is scarce"* (PRA-based workshop, School 2, Participant 2). On the other hand, another participant mentioned some challenges that School 3 faced with their water tanks, indicating the following: *"Water, is a challenge, also, because we've got tanks, but our gutters, we have got a challenge with the gutters and our tanks are only two…and even the way we the pipes from our tanks to our garden is not small, so we have a problem"* (PRA-based workshop, School 3, participant 3). Photographs 4.7 and 4.8 illustrate how Schools 1 and 2 indicated their need for watering equipment as part of the PRA-based workshops.



Photograph 4.7: Required watering equipment to enhance the sustainability of a school-based vegetable garden at School 1



Photograph 4.8: Required watering equipment to sustain the school-based vegetable garden at School 2

Finally, participants seemingly agreed that knowledge about an aspect such as soil enrichment can support the sustainability and success of a school-based vegetable garden. A participant from School 3 stated in this regard: *"Compost, make your soil looking good and ready for planting"* (PRA-based workshop, School 3, Participant 1). Other participants from Schools 3, 4 and 5 agreed that compost is an important element in a school-based vegetable garden (Field notes, School 3, 4 & 5, 1 October 2015 & 12 October 2015). In stipulating suitable parts or ingredients for soil enrichment, participants referred to compost, manure and mulching. In addition to compost, participants from Schools 1, 2, 3 and 5 emphasised manure as an enriching element to soil (Field notes, Schools 1, 2 & 3, 7 August 2015 & 1 October 2015).

4.4.4 Sub-theme 2.4: Accessing and enhancing knowledge

Participants seemingly held the view that access to and the enhancement of knowledge can improve the sustainability of school-based vegetable gardens. More specifically, participants mentioned that knowledge on exactly what has to be done, when it should be done and where it should happen, are aspects that will impact on the success of a school-based vegetable garden. To this end, a participant from School 4 indicated that it is important to have a person on the team with specialised knowledge, and stated: *"You need at least one person with vegetable knowledge to know what to plant when and to prepare to know next month I must have this ready"* (PRA-based workshop, School 4, Participant 1). Another participant confirmed this view by saying: *"You need knowledgeable people to come in"* (PRA-based workshop, School 4, Participant 1). Participants from School 5 identified the Department of

Agriculture as valuable resource in this area, who had given their school access to and increased their knowledge on gardening in the past. One of the participants summarised this experience, saying that: *"The Department of Agriculture has advised us"* (PRA-based workshop, School 5, Participant 2).

Closely related, participants from School 1 also provided examples to illustrate the importance of access to knowledge. A participant explained:

> *"In summer, these are the things that we do, it's the preparation of soil and plant the following plants, spinach, peppers, cauliflower and in winter we grow spinach, pepper, spring onion. In autumn it's spinach, potato, carrot, lettuce and peppers, onions, beetroot and turnips. During spring we grow maize, tomatoes and spinach, spring onions and avocado's"* (PRA-based workshop, School 1, Participant 1).

Another added: *"We do crop rotation and then we do intercropping"* (PRA-based workshop, School 3, Participant 2).

These contributions indicate that participants seemingly realised the importance of gaining the necessary knowledge on gardening in order to ensure success. Participants from School 1 stated that workshops are valuable in obtaining such required knowledge (Field notes, School 1, 12 October 2015) and furthermore said: *"We need workshops of how you are going to deal with a garden"* (PRA-based workshop, School 1, Participant 3). Closely related, another participant from School 4 suggested access to study material in order for them to gain knowledge about the management of a sustainable school-based vegetable garden (PRA-based posters, School 4). In further support, I noted the following in my research diary: *"The participants were serious about living out the principal of knowledge is power"* (Research diary, School 4, 1 October 2015). Participants agreed that knowledge can be transferred and emphasised the importance of learning from others. They said:

> *"We also try to gather as much, also from you we will try to gather some knowledge of how to go commercial of it so from everyone we try to get some knowledge. I mean if he might know nothing about the garden but he might know the marketing side of the garden, or the place where we can go so we can get some contacts"* (PRA-based workshop, School 3, Participant 4).

Participants furthermore shared their view that knowledge can be accessed in various forms and that parents are a valuable source of information. A participant from School 2 for example said: *"Parents will come out with their knowledge that they've got of their vegetable gardens, that's why we must be able to use them, because sometimes they know better about how to plant"* (PRA-based workshop, School 2, Participant 1).

Participants from School 3 specifically spoke about the value of indigenous knowledge and knowledge on how to grow different types of vegetables (Field notes, School 3, 12 October 2015). They said: *"Our parents then, likes to grow and plant right around their ground, even if they are not farmers, so that knowledge helps us a lot, because when we are in the garden that knowledge comes back"* (PRA-based workshop, School 3, Participant 2)**.** The same participant spoke about the value of parents' indigenous knowledge and said: *"They didn't have that in English, it was in their indigenous language and somebody could not interpret. Now it seem in our days that it is a new thing (planting vegetables), but it was done by our forefathers without any terminology put in that"* (PRA-based workshop, School 3, Participant 2), as well as: *"If you think back, our parents were doing that, they were planting maize, they were planting beans, pumpkins and then it didn't have a name, but they pulled on their own indigenous knowledge"* (PRA-based workshop, School 3, Participant 3).

Participants furthermore emphasised the value of expert volunteers from the community in terms of accessing and increasing their own knowledge (Field notes, School 4, 12 October 2015). One participant from School 3 explained the possibility of gaining knowledge from a range of resources. She said: *"The knowledge is from everywhere. People think the knowledge is from books, but it's even also from the community. Like they will come here and ask, Ok, what are you doing here because we've got some herbs in our garden, we plant herbs for the love of planting"* (PRA-based workshop, School 3, Participant 3)**.** Businesses from outside the community were identified as yet another source of information on the sustainability of school-based vegetable gardens. As an example, participants from School 5 explained that a business had advised them on how to manage pests in their vegetable garden (Field notes, School 5, 12 October 2015). Participants from School 3 also mentioned the utilisation of technology, such as the Internet, as a resource to access and increase knowledge on sustainable school-based vegetable gardens. They explained: *"Then we Google to get the knowledge"* (PRA-based workshop, School 3, Participant 1)**.**

On the other hand, participants reportedly experienced a lack of knowledge as potential challenge to sustain school-based vegetable gardens. One participant from School 1 provided an example and reported: *"Let me first mention, we have a problem as some of the teachers of sometimes not knowing what plants to grow, or at what time"* (PRA-based workshop, School 1, Participant 1). Another participant once again emphasised the need for knowledge on practical things, such as soil enrichment and

seasonal planting, in order to have success and sustain a garden. This participant commented: *"We also need knowledge, to work the soil. We must know what crops to grow in winter and what crops to grow in summer"* (PRA-based workshop, School 3, Participant 1).

4.4.5 Sub-theme 2.5: Continuous planning and monitoring

Participants were reportedly of the opinion that continuous planning and monitoring will add value to the success of a school-based vegetable garden. A participant from School 1 mentioned that teamwork supported continuous planning and monitoring. This participant said: "*I should think we can sit in a meeting situation and then discuss it. We are doing it as a group"* (PRA-based workshop, School 1, Participant 3). Participants furthermore provided examples of their planning to illustrate the importance thereof. For example, School 1 stated the following:

> *"We have a time-table for when we work. It's very important like on Monday you are going to work in the garden and do watering in the mornings at 7 o'clock. Afternoon 5 o'clock we are going again and doing watering. And then we skip Tuesday because we cannot use a lot of watering in the garden because too much watering is also wrong. Then we go on Wednesday to look if there is weeds. Friday we can look if mulching is enough because you must always have enough mulching because mulching is very important to keep your garden wet"* (PRA-based workshop, School 1, Participant 2).

Publicity of a school-based vegetable garden was identified as another aspect that requires continuous planning in order to ensure that other individuals and businesses are aware of the schools' vegetable garden. One participant from School 3 stated:

> *"The crops, like last week we had a heritage day, we cooked all the traditional things. We also have some events with our garden, for help, it's not easy to just phone somebody and say we need help so what we do is we have environmental calendar, since we are also involved with environmental groups, so if we see, its March, that will be the water month and for us to get those tanks, we must have that event, celebrating water day and then invited the rotary club and then they donated those tanks. When it's October we have well food day on the 26th, we will be harvesting those and exhibiting that and then we will get some seeds from the other department and then it was heritage, so we use that environmental calendar to make those events so that we can host events to get donations"* (PRA-based workshop, School 3, Participant 2).

Participants from School 3 accentuated the importance of continuous planning by emphasising that planting should occur according to an environmental calendar (Field notes, School 3).

Finally, participants emphasised the importance of regular monitoring of school-based vegetable gardens, for example commenting that: *"It will fall into our hands, we supposed to monitor"* (PRA-based workshop, School 2, Participant 3). Similarly, a participant from School 4 added: *"You should get a prefect system where you have a head gardener where the teacher only monitors then we don't have to come in every week"* (PRA-based workshop, School 4, Participant 2). Despite realising the importance of this action, School 5 reportedly experienced limited monitoring, which in their view posed a challenge at the school (Field notes, School 5, 12 October 2015).

4.5 FINDINGS OF THE STUDY

In this section I relate the identified themes and sub-themes to existing literature. I focus on correlations and contradictions between existing literature and the results of this study.

4.5.1 POTENTIAL VALUE OF SCHOOL-BASED VEGETABLE GARDENS

Overall, I found that the participants who are involved in the vegetable gardens at their schools, valued being involved in such initiatives, and also viewed vegetable gardens as a valuable resource for schools and communities. They specifically referred to health-related advantages, economic and career-related advantages, and learning and curriculum-related outcomes of school-based vegetable gardens for learners.

Experienced value implies positive experiences for learners, parents and other community members. This finding confirms the work of Armstrong (2000), who suggests that school-based vegetable gardens have widespread community-based advantages. Similarly, Somerset et al. (2005) emphasise that school-based vegetable gardens imply benefits on psychological, physical and economic levels, not only for learners, but also for the school, teachers, parents and other community members.

4.5.1.1 Health-related advantages

The findings of this study indicate that school-based vegetable gardens can be a source of food and nutrition for vulnerable learners, their families and community members. This finding is consistent with research from the FAO (2010) which suggests that surplus produce from school-based vegetable gardens can be given to orphanages, as well as less fortunate learners and community members. In this regard, I found that many learners in the community where I conducted this study are in need of more substantial food and nutrition. Luruli et al. (2016) agree and indicate that many individuals in South-Africa form part of resource-constrained communities, and are

subsequently challenged by high levels of preventable illnesses because of poor diets and low nutritional consumption. Consistent with existing literature, I furthermore found that the school-based vegetable gardens can provide nutrition to learners and adults when they experience illnesses (Kennedy, 2009). I also found that schools with school-based vegetable gardens sometimes send vegetables home with learners, in confirmation with the FAO (2005) project. In addition, according to the findings of the current study, school-based vegetable gardens are viewed as a source of healthier and more nutritious food for communities. In correlation with this finding, Armstrong (2000) also found that school-based vegetable gardens can improve the nutritional status of communities, as people share their produce with neighbors and friends.

The results of my study furthermore indicate that school-based vegetable gardens can be utilised to supplement school feeding schemes and school kitchens. Gelli (2010) confirms this finding by indicating that school-feeding schemes can contribute to lower levels of absenteeism and hunger-related illnesses. This finding is also in line with the value of school-based vegetable gardens as envisioned by the DBE in terms of the National School Nutrition Programme (NSNP) (Patel, 2015; Department of Education, 1994).

Finally, I found that the produce of school-based vegetable gardens can potentially serve as food for teachers, who may purchase fresh produce from school. This finding is confirmed by Madaleno (2001), who adds that access to vegetable gardens is synonymous with fresh food, as well as a healthier diet (James et al., 1997). Even though the participants in this study referred to improved access to fresh and healthier food types, they did not report on the potential of school-based vegetable gardens to address obesity, as found by Ratcliffe et al. (2011), as well as Hedley et al. (2004). Possible reasons for this identified silence in the data of the current study may include that participants were pre-occupied with the school-based vegetable garden being a source of healthier food to address malnutrition and hunger and that they did not yet make the connection to obesity. Furthermore, it might be that participants saw malnutrition, and hunger as more serious treats to health than obesity. However, this is a mere hypothesis that requires further investigation.

4.5.1.2 Economic and career-related advantages

In terms of skills acquisition, this study indicates that a school-based vegetable garden can support individuals in developing skills, that may in turn support them to address unemployment, or to provide employment opportunities for learners who want to

pursue a career in agriculture. This finding aligns with research done by the United Nations Department of Social and Economic Affairs (2015), as well as Somerset et al. (2005), that indicate how school-based vegetable gardens can support individuals in terms of skills development for employment on farms, as well as to gain entrepreneurial skills (FAO, 2010). I furthermore found that school-based vegetable gardens can be a source of income for both schools and individuals, which can in turn support the maintenance of the school-based vegetable garden, as well as contribute to the alleviation of poverty.

To this end, participants furthermore viewed school grounds as spaces, which parents can potentially utilise to plant vegetables in support of their households, to generate an income, or to become more involved at school. These findings are echoed by the work of the FAO (2005), indicating how parents, the elderly and unemployed community members can be recruited to work in school gardens in exchange for a piece of land on the school grounds, where they can plant their own vegetables for personal use or generate an income for themselves. The FAO (2010) furthermore confirms that underprivileged parents can become more involved at school by providing services through their practical skills such as gardening.

4.5.1.3 Learning and curriculum-related value for learners

In terms of applying the school curriculum in practice, this study indicates that school-based vegetable gardens can provide learners with opportunities for activity-based learning. In line with existing literature (Graham et al., 2005), most participants indicated the utilisation of school-based vegetable gardens to bring the curriculum to life, by applying theory in a practical way. Participants namely confirmed that learners who visit school-based vegetable gardens can gain practical experience in Science and Technology, as well as in other related learning areas, that can broaden their understanding of core concepts. School-based vegetable gardens can indeed be used by teachers to enrich various learning areas, as suggested by Thorp and Townsend (2001). Other studies indicate that school-based vegetable gardens can provide a space for learners to play in (Hedley et al., 2004; Pranis, 2004) or where they can spend time during breaks. In support of findings indicated in existing literature (Ozer, 2007), I furthermore found that school-based vegetable gardens can also create opportunities for learners to learn life skills.

In addition, I found that schools can utilise vegetable gardens to facilitate environmental awareness amongst learners. This finding correlates with research by

Viola (2006) as well as Blair (2009) who suggest that school-based vegetable gardening can cultivate an improved environmental attitude within learners, as they develop pride about the garden that they work in. Finally, the findings of this study indicate that some teachers prefer that learners are not involved in school-based vegetable garden activities, as such involvement may take up too much academic time and present additional challenges, such as added planning that might be required from the teachers' side and that learners may damage the produce. This finding is in contrast with research focusing on the positive effects of learner engagement in school-based vegetable gardens. Possible reasons for this contradiction in the data might be that not all schools have yet experienced the positive effects that a school-based vegetable garden might have on learners. Furthermore, participants might not yet view a school-based vegetable garden as a tool that could enrich the curriculum, and may be overwhelmed by the practical requirements of trying to sustain the vegetable garden, rather than viewing learners as potential human resources. However, this is a mere hypothesis that requires further investigation.

4.5.2 MAINTAINING A SCHOOL-BASED VEGETABLE GARDEN

The findings of this study indicate thorough planning and monitoring, knowledge, human resources, sufficient environmental conditions and suitable infrastructure as key requirements to be able to establish and sustain a school-based vegetable garden. All these requirements can support a school-based vegetable garden, yet may also pose distinct challenges if not met.

4.5.2.1 Involving suitable role-players who are knowledgeable or can obtain knowledge

This study highlights the importance of support by school management teams, which directly relates to the regular and enthusiastic involvement of school principals. This finding is confirmed by Veslind and Jones (1998), as well as Ozer (2007). Similarly, the findings relate to research done by the United Nations (2010), which emphasises that successful school-based vegetable gardening initiatives are often characterised by the enduring support of key role-players, such as teachers, parents, learners and community members. This finding is furthermore reflected in the work of Somerset et al. (2005), who emphasise the importance of extensive and continuing support of key role-players as a valuable component to a sustainable school-based vegetable garden.

In addition to internal and closely involved role-players, I found that external role-players, such as the Department of Basic Education and Rural Development are important for the success of school-based vegetable gardens. This finding aligns with

other literature, suggesting that a school-based vegetable garden cannot thrive without the support of external role-players, such as representatives from the local education authority, involvement from local agricultural and health services, as well as experts from outside the school and other schools (FAO, 2005). Other sources (Ozer, 2007) similarly indicate that school-based vegetable gardens are often more successful when more people become involved. Contrary to existing literature however, I found that some of the participants experienced the involvement of many individuals in a school-based vegetable garden as challenging. This may be due to participants not having clear roles and boundaries concerning each role-players involvement. However, this is a mere hypothesis that requires further investigation.

The establishment of a sustainable school-based vegetable garden also requires a sound knowledge base and accessing informative resources, as indicated by my findings. This idea is consistent with research done by Viola (2006), who states that a school-based vegetable garden project requires knowledge and a variety of skills to deal with challenges that may potentially influence the projects' sustainability. Participants in the current study similarly indicated that a school-based vegetable garden may fail due to a lack of planning and limited background knowledge. This finding aligns with the work of Lane et al. (1994), which suggests that a lack of training and skills are barriers to the successful implementation of a school-based vegetable garden. Closely related, the current study indicates the importance of indigenous knowledge and links expert volunteers or parents as resources that are vital to success and sustainability. These findings confirm the work of the FAO (2010), as well as Galhena et al. (2013), indicating that knowledge from various role-players can have a valuable influence on the sustainability of school-based vegetable gardens.

Participants furthermore confirmed that teachers may lack the necessary knowledge on vegetable gardening, thereby limiting the possibility of maintaining a successful garden. This finding echoes the research of Brunotts (1998), Faddegon (2005) and Graham et al. (2005) who all suggest that teachers are most often the key role-players who are placed in charge of school-based vegetable gardens, but that teachers may not necessarily be agriculturally well-informed, and may lack basic vegetable gardening knowledge and skills. Closely related, Goodwin (2008) too suggests the importance of teachers improving their professional capacity in terms of knowledge, skills and attitudes towards school-based vegetable gardens, as they are viewed as key role-players in sustaining such projects.

Finally, I found that a successful school-based vegetable garden is dependent on the commitment and passion of those involved. This finding relates to the work of Goodwin (2008), who emphasises the importance of key role-players' positive attitudes towards school-based vegetable gardens in order to ensure transference of their positive attitudes to the surrounding community. In line with existing literature (Lee et al., 2002), I also found that the success of a school-based vegetable garden will depend on the enthusiasm and diligence of key role-players, such as teachers, principals and learners. Ozer (2007) supports this finding and elaborates by proposing that everyone involved should take responsibility for a school-based vegetable garden. This finding is furthermore confirmed by the work of the United Nations (2010), stating that school-based vegetable gardens often form part of whole school participation. In linking this with the findings I obtained, it is clear that the sustainability of a school-based vegetable garden is greatly influenced by the attitude of the role-players involved.

4.5.2.2 Optimising environmental conditions

The current study indicates that suitable environmental conditions are needed to sustain school-based vegetable gardens. This requirement includes having a sufficient site, with healthy soil, to start the school-based vegetable garden. In addition, sun, shade and wind is important considerations. This finding is consistent with research by Somerset et al. (2005), as well as Ozer (2007), who both suggest that the identification of a suitable area to create a school-based vegetable garden is imperative to success. Furthermore, this study highlights the importance of adequate weather conditions and sufficient sunlight. This finding also relates to the research of Somerset et al. (2005), as well as Ozer (2007) who suggest that enough water and sunlight is required to sustain a school-based vegetable garden. My finding on the importance to plant vegetables that are able to withstand harsh weather conditions, such as sweet potatoes, furthermore aligns with research from the FAO (2014), indicating that it is essential to know what types of vegetables will grow best in a specific area (Lee et al., 2002).

Finally, the findings of this study indicate that access to water and healthy soil is essential for sustainability of a school-based vegetable garden. In this regard, the FAO (2014) indicates that the availability of adequate water and healthy soil are indeed essential to a successful school-based vegetable garden project. In addition, participants in this study mentioned that school-based vegetable gardens need to be protected from the elements. This finding aligns with studies by the Department of

Agriculture (2006) and the FAO (2014), both emphasising protection from the wind as necessary for success. Existing literature on suitable environmental conditions as a requirement to sustainable school-based vegetable gardens therefore correlate with the findings of this study, indicating that harsh weather conditions and unsuitable environmental factors pose a considerable challenge to sustainability of school-based vegetable gardens.

4.5.2.3 Relying on suitable infrastructure

In line with existing literature (FAO, 2014), I found that school-based vegetable gardens require sufficient infrastructure in order to be sustainable. Quality seeds and seedlings may influence the success of crops. Gardening equipment is furthermore indicated as necessary to work in a school-based vegetable garden and maintain it. Equipment may include spades, forks, rakes, watering cans, hosepipes and wheelbarrows. This finding is supported by Bremner and Pusey (1990), who add pangas, hoes, shovels, buckets, sticks, string and a tape measure to the basic set of tools. In contrast to current literature however, I found that some participants had experienced that one does not necessarily need all the gardening equipment mentioned and that one can work in the garden without these. I furthermore found that protective clothing is viewed as important in order to protect people's clothes when working in the garden. This finding aligns with the recommendations of the FAO (2014). Participants lastly emphasised the importance of watering equipment to improve sustainability of school-based vegetable gardens. Closely related, Richards et al. (2015) foregrounds the importance of irrigation for vegetable gardening and proposes different ways in which irrigation can be implemented.

Next, findings of the current study point to the value of good quality seeds and seedlings in order to ensure successful crops. In support of this finding, research by the FAO (2010) confirms the need to start with good quality seeds. In addition, strategies to enhance and protect produce are foregrounded as important to enhance sustainability by both my findings and the FAO (2014). I more specifically found that the enhancement of the quality of soil is regarded as central by people who work in school-based vegetable gardens, to ensure that plants grow optimally. I furthermore found that people enrich the quality of soil through adding compost, manure, and vegetable waste, as also suggested by the DBE and FAO (2014). Participants in this study confirmed that mulching can also enhance the quality of soil, which is supported by Somerset and Markwell (2009).

In terms of financial support, I found that school-based vegetable gardens in resource-constrained contexts are often reliant on external funding, which may impact on the sustainability of the garden. This finding correlates with the work of Azuma et al. (2001), as well as Ozer (2007). A number of participants specifically indicated the role of school principals in obtaining such external funding, but also mentioned that schools primarily have to work with what they have and that funding should not determine the establishment of a school-based vegetable garden. This finding aligns with existing literature, suggesting that limited finances are not necessarily an obstacle, when aiming to establish successful vegetable gardens (Lee et al., 2002).

4.6 CONCLUSION

In Chapter 4, I presented the results of the study in terms of two main themes I identified and the related sub-themes that emerged. In discussing the results, I included extracts from the data. Thereafter I contextualised the results against the backdrop of existing literature, highlighting both similarities and inconsistencies between the results I obtained, and those reflected in existing literature.

I conclude this study in Chapter 5 by addressing the research questions I formulated in Chapter 1. Furthermore, I contemplate the potential value of and reflect on the limitations of the study. I end off with recommendations for further training, practice and research.

CHAPTER 5

CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION

In Chapter 4 I discussed the results and findings of the current study, by relating the results of the study to existing literature. I indicated how the findings of the current study align and contradict literature, identified silences and highlighted new insights where relevant.

In Chapter 5, the concluding chapter, I provide an overview of the preceding chapters. I then come to conclusions based on my initial research questions as formulated in Chapter 1. Furthermore, I present the potential contributions of the study and reflect on limitations and challenges I experienced. I conclude this chapter by formulating recommendations for future training, practice and research.

5.2 OVERVIEW OF PRECEDING CHAPTERS

In **Chapter 1** I introduced the study and explained my rationale for undertaking this research. I presented the purpose of the study, which was to explore and describe the perceptions of key role-players on best practices for initiating and sustaining school-based vegetable gardens. I formulated the research questions, explained the key concepts that relate to this study and clarified my working assumptions. I introduced the selected paradigmatic perspectives, stated the research design and provided an overview of the methodological strategies I employed for data generation, documentation and analysis. I concluded the chapter by briefly mentioning the ethical strategies and quality criteria I strived to adhere to in undertaking this research.

In **Chapter 2** I explored existing literature relevant to the focus of the current study. I focused on various literary perspectives and, for example, discussed the current global food and nutrition scenario, together with global responses to hunger and malnutrition, focusing on the potential value of school-based vegetable gardens. I concluded the chapter by explaining how Bronfenbrenner's social ecological model (1979), as underlying framework, guided this research.

In **Chapter 3** I explained the manner in which I undertook the empirical part of my study in order to address the research questions I formulated. I discussed Interpretivism as epistemology, the qualitative research methodological approach and the case study design, with the application of PRA-based principles as I implemented these. I also

elaborated on the selected strategies for data generation, documentation and analysis. These strategies include PRA-based workshops, audio and visual data generation and documentation strategies, observations, field notes and a research diary. I concluded the chapter by reflecting on the role I fulfilled as researcher, as well as the way in which I followed ethical guidelines and aimed to meet quality criteria in order to ensure trustworthiness.

In **Chapter 4** I presented the results of the study in terms of two main themes and associated sub-themes I identified subsequent to inductive thematic analysis. I then discussed the findings of the study by relating the results I obtained to relevant existing literature in the field. I highlighted the findings that support existing literature as well as those contradicting what is known, I also referred to silences in the data and how new insights emerged.

5.3 CONCLUSIONS

In the following sub-sections, I come to conclusions based on the findings of the study. I first address the secondary research questions, and then the primary question that guided the study, as formulated in Chapter 1.

5.3.1 SECONDARY RESEARCH QUESTION 1: *How is a sustainable school-based vegetable garden conceptualised?*

The findings of the study indicate that sustainable school-based vegetable gardens are conceptualised in terms of certain prominent characteristics. Such a garden is typically situated in a space which provides adequate, yet not excessive sun and shade. A sustainable school-based vegetable garden will additionally benefit from wind-breakers, as this can protect a garden from the negative effect of extreme wind. A sustainable school-based vegetable garden furthermore implies adequate water provision in the form of rainwater or municipality water.

In addition to the importance of suitable natural resources and favourable weather conditions, this study also highlights the importance of supportive infrastructure and equipment. Findings namely indicate sufficient gardening equipment, protective clothing, good quality seeds and enriched soil as important to being able to sustain a school-based vegetable garden. Based on the findings I obtained, I argue that people in resource-constrained settings can rely on examples and knowledge to attend to this requirement, by adding compost, manure and vegetable wastes to the soil of their gardens. Mulching can also be used to protect and enhance the quality of soil.

Finally, sustainable school-based vegetable gardening is not possible without the dedication and continuous support and involvement of teachers, parents, learners and community members. External role-players, such as the Department of Basic Education and Rural Development, can also serve as supportive resources. In addition to people investing their time and dedication, sustainable school-based vegetable gardens are defined by the role-players' access to knowledge, additional training opportunities and skills acquisition. Indigenous knowledge and expert volunteers can be linked as potential sources of such information. However, as already implied, sustainable school-based vegetable gardens are in principle dependent on the human qualities of the role-players, such as commitment, passion, a positive attitude and continuous planning.

Based on the findings of this study I can thus conclude that people involved in sustainable school-based vegetable gardens conceptualise these gardens in terms of natural resources, infrastructure, human resources and knowledge and skills. In addition to looking amongst themselves for resources and such knowledge and skills, they can rely on external resources for assistance. As underlying determining factor however, those who are involved can determine the success (or not) of a garden, based on their enthusiasm, dedication and commitment.

5.3.2 SECONDARY RESEARCH QUESTION 2: *Which resources may promote a sustainable school-based vegetable garden?*

A school-based vegetable garden requires specific resources to become sustainable. Sustainable school-based vegetable gardens require role-players as resources, who are involved and passionate about the garden. These role-players should demonstrate commitment and dedication and remain excited about their involvement in the garden.

Support by the school principal can be regarded as a vital resource, as well as appreciation shown to role-players for their role in the success of a school-based vegetable garden. Successful and sustainable school-based vegetable gardens typically involve role-players who have a positive outlook on the garden and its value. These individuals will typically see the benefits of a school-based vegetable garden, rather than focusing on negative connotations and stereotypes that may be attached to vegetable gardening.

Knowledge can be regarded as another important resource that may hinder or add to the sustainability of a vegetable garden. In addition to knowledge obtained from books

or training, role-players can make use of indigenous knowledge and use what they had been taught by their parents or other community members to enhance sustainability. These role-players and people they know, generally know how and when to plant different types of vegetables. In addition, role-players can access other resources to obtain additional knowledge if the need arises, or consult with expert volunteers, community members and parents. They can furthermore access resources on the Internet or obtain knowledge from workshops or governmental departments.

In addition to human resources and relying on a solid knowledge base, sustainable school-based vegetable gardens require adequate physical resources. More specifically, fencing is required to protect crops from animals and pesticides (whether organic or not) are important to ensure healthy plants and crops. Sufficient irrigation is yet another required resource, as well as water tanks in order to collect rainwater for dry seasons. Adequate infrastructure, in the form of gardening equipment is another required resource, and include tools such as a spade, fork, rake, watering can, hosepipe and wheelbarrow. Even though some of the participants (although limited in number) in this study had the view that gardening equipment is not a necessity for sustainability, the majority emphasised the need for sufficient equipment to sustain a garden. In addition, protective clothing can support the functionality of role-players, including objects such as hats, gloves, overalls, boots or other protective shoes.

In addition to relying on internal resources and knowledge, sustainable school-based vegetable gardens can benefit from external resources in the form of donations by e.g. governmental departments, or guidance by expert volunteers. Findings however suggest that over-dependence on external resources can be a hindrance to sustaining a school-based vegetable garden and that it is better to make use of available resources for such a project. Something like publicity on a garden can however be pursued as an opportunity for obtaining possible future donations and support from outside the school.

5.3.3 SECONDARY RESEARCH QUESTION 3: Which challenges may inhibit the sustainability of a school-based vegetable garden?

Based on the findings of this study I argue that all the resources required to sustain a school-based vegetable garden can also be challenges, if not sufficiently provided and functioning. In the process of sustaining a school-based vegetable garden, role-players can thus face various challenges, which can negatively impact on available resources.

As school-based vegetable gardens are labor-intensive and require adequate time and attention, role-players such as teachers and learners may for example be challenged due to them having other responsibilities and not necessarily having the energy or time to prioritise the garden. To overcome this challenge, community members, parents and learners can however be utilised during times when teachers cannot attend to the garden, or rotation of people involved can be implemented. To this end, I propose that key role-players should take responsibility to organise specific individuals who can attend to the garden in critical periods. Another solution suggested by this study (although only by a limited number of participants), involve key role-players working according to a fixed time-table in order to ensure regular intervals of people working in the garden. The involvement of learners in school-based vegetable gardens can sometimes be regarded as challenging, yet learners can be involved in various ways with success. In addition, several learning areas can be enriched for learners by involving them, in support of a sustainable project.

Having limited knowledge, skills and training on how to sustain a successful school-based vegetable garden, can also pose challenges. However, knowledge is available in various forms from several sources. Key role-players should take initiative and responsibility to identify gaps in their knowledge and to approach these sources of knowledge in order to improve sustainability. I conclude that the key role-players that are often involved in the school-based vegetable garden are not always the most knowledgeable in terms of gardening skills and knowledge on sustainability, but that there are numerous sources available within the school, in the community and even further, which they can approach for support.

Finally, environmental conditions and limited infrastructure can pose challenges to the sustainability and success of a school-based vegetable garden. A scarcity of rain can lead to draught where crops burn and eventually die. On the other hand heavy rains can cause flooding and result in plants not growing adequately. Soil quality may be poor and pose yet another challenge to plants. In addition, seed quality, the wind, sun, pests and insects may damage crops. Other possible challenges to sustainability include the theft of crops, which can be solved by a fence. In terms of gardening equipment, some participants (although only a few) suggested that those who work in the garden can bring their own equipment and take it home afterwards in order to ensure that those tools are not stolen. Limited tools and clothing can however pose a distinct challenge to role-players. As a result, I proposed that schools should take

responsibility and organise donations from stakeholders such as NGOs and governmental departments.

5.3.4 PRIMARY RESEARCH QUESTION: *What are the perceptions of key role-players regarding best practices on sustainable school-based vegetable gardens?*

In an attempt to answer the primary research question, it is necessary to refer to the secondary research questions. Based on the findings I obtained I can conclude that the participants in this study perceived their resource-constrained school-communities as one that is significantly affected by poverty and unemployment, having an effect on the micro-, macro- and exosystems. This situation determines what community members eat, as well as where they source their food. As such, I can conclude that poverty and unemployment may potentially be alleviated by means of sustainable school-based vegetable gardens.

I further found that participating role-players are knowledgeable on best practices for sustainable school-based vegetable gardens. Based on the principles of Bronfenbrenner's ecosystemic theory, the value of such knowledge and skills, can contribute to the success of vegetable gardens. In addition to the resource of knowledge, participants' willingness to collaborate with one another as community members and with the research team, emphasises yet another aspect of Bronfenbrenner's theory, namely that different systems and contexts can be viewed as permeable in connection with individual needs and the possibility of facilitating positive change.

Based on the findings of this study, it can be derived that participants, on a micro systemic level, view school-based vegetable gardens as valuable and beneficial for learners in terms of nutritional supplementation and enhancement. Next, on an exosystem level, school-based vegetable gardens have value for schools in terms of adding nutrition by means of fresh vegetables for school kitchens or school feeding schemes. Furthermore, school-based vegetable gardens hold value for teachers as they may get the opportunity to buy fresh produce from the school. Finally, on a macro systemic level, school-based vegetable gardens imply value for the broader community as school grounds can e.g. be used by underprivileged parents to plant vegetables for their families. In this sense, schools can support the wider community by providing produce from vegetable gardens to the elderly, sick and vulnerable members of communities. This can lead to more nutritional food being made available to families who may not have sufficient food intake.

For learners, school-based vegetable gardens can provide a valuable tool that can be utilised to enrich the curriculum and allow for the practical application of the theory which is taught. Learners typically enjoy spending time in gardens as they play while acquiring the skill of growing vegetables. This skill may enable them to plant their own vegetables for their families or to later obtain employment requiring gardening skills. This can specifically create opportunities of employment for learners who do not excel academically, or for those who are interested in agriculture. Learners who have exposure to a school-based vegetable garden will also gain environmental awareness as they learn to grow vegetables.

Based on the findings of this study, I propose that community members in resource-constrained areas are able to realise that changes within the microsystems of the school-community can potentially result in positive change both internally and in other micro-systems (such as other families in the community), thereby effecting change within the mesosystem. This illustrates Bronfenbrenner's (2005) theory that change in one system will cause a ripple effect in other systems. As such, I propose that, even though a community can be perceived as negatively affected by factors in their macrosystem (poverty and unemployment), changes in micro-systems can result in positive change and support a community's health and well-being, despite the challenges it faces.

5.4 POTENTIAL CONTRIBUTIONS OF THE STUDY

This study provides a conceptualisation of a sustainable school-based vegetable garden by drawing on the ideas of people situated in a resource-constrained environment. Furthermore, the study elaborates on the required resources to promote sustainable school-based vegetable gardens and perceptions on the value of school-based vegetable gardens. As such, the current study adds insight into the potential positive effects of establishing school-based vegetable gardens in order to address the needs of various groups of people on multiple levels. More specifically my findings contribute to the utilisation of school-based vegetable gardens involving and benefiting learners, teachers, parents and the wider community. Furthermore, this study provides insight into the challenges that may inhibit the sustainability of a school-based vegetable garden, and adds to the knowledge base of key role-players' (principals, teachers, parents and volunteers) perceptions on best practices for sustainable school-based vegetable gardens, which is an area of knowledge that has not been explored extensively to date.

In addition, this study provides context-specific insight with regards to the aforementioned topics within the context of South African resource-constrained communities, which implies an area of concern that requires ongoing research. Findings related to the potential positive outcomes of school-based vegetable gardens could furthermore inspire learners, teachers, parents and other community members to increase their access to healthier food and their own nutritional status by establishing their own vegetable gardens, or become involved in school-based vegetable gardens. The findings may furthermore serve as example of how community members may utilise vegetable gardens to generate an income and improve their agricultural skills, or implement garden-based learning and experiential learning activities in their own lives, in support of addressing poverty, malnutrition and household food insecurity.

As such, on a broader level, this study also contributes to existing literature on school- and community-based health promotion initiatives in the South African context, as well as a potential way of addressing the challenges often faced by people in resource-constrained contexts. For professionals involved in school-based interventions, such as educational psychologists, counsellors, social workers, dietitians and occupational therapists, an enhanced understanding of sustainable school-based vegetable gardens in resource-constrained communities may potentially inform the manner in which these professionals view and approach working with schools, learners, teachers, parents and community members. An enhanced understanding of sustainable school-based vegetable gardens can furthermore enable such professionals to apply their specialised knowledge and skills in a manner that is suitable for the South African context.

As the current study forms part of the broader FIRST GATE project, it also adds to the body of knowledge generated within the project. As such, it forms part of a knowledge base that can lead to follow-up research in this area. The findings of this study furthermore informed the colloquium that was held during March 2016 where participants in the study presented their experiences and perceptions of best-practices on sustainable school-based vegetable gardens to peers. As part of the colloquium, the findings of this study informed the development of a manual (Ferreira et al., 2016) that was distributed to all participants in the FIRST GATE project, as a resource that can support related role-players in starting and sustaining school-based vegetable gardens.

5.5 CHALLENGES AND POSSIBLE LIMITATIONS

A limitation often associated with qualitative studies relates to the lack of generalisability of the findings. Considering that only fourty-eight participants (n=48) in a specific school-community participated in this study implies that the findings cannot be generalised. Nonetheless, I did not aim to obtain generalisable findings, but rather intended to attain an in-depth understanding of key role-players' perceptions on best practices for sustainable school-based vegetable gardens in a specific resource-constrained school-community. The findings from this study may potentially be transferred to a similar context, based on the in-depth explanations postulated in this mini-dissertation, without generalising the results.

Next, seeing that this study forms part of my training as a master's student in educational psychology, I had to remain cognisant of my role as researcher throughout the research process. As part of my training in educational psychology, I have been taught diverse skills related to school- and community-based interventions. I thus had to rely on continuous reflection with my supervisors, in order to support me to remain focused on my role as researcher during the research process, rather than taking on the role of psychologist or counselor.

A third possible limitation of this study relates to the cultural and language differences between the participants (IsiXhosa culture) and the research team (Afrikaans culture). These differences could have influenced the way in which I made sense of the generated data, and interpreted the results. To this end, I remained aware of this possibility throughout the study and endeavoured to avoid this potential negative influence through continuous discussions with my supervisors. In addition, I included member checking, in order to confirm that the themes I identified indeed reflect the participants' thoughts and opinions, prior to finanlising these.

5.6 RECOMMENDATIONS

In the following sub-sections I make recommendations for training, practice and future research, based on the findings of the study.

5.6.1 RECOMMENDATIONS FOR TRAINING

The findings of this study underline the prospective function of key role-players in resource-constrained communities, such as teachers, principals, parents, volunteers and community members, who can collaborate with educational psychologists and researchers from tertiary institutions in support of communities who face challenges.

Not only can key role-players be involved in generating and transferring information on best practices to others, they can also be involved in the development and implementation of health promotion interventions, as well as the facilitation of well-being and positive change amongst families within South African resource-constrained communities. This study might, per se, serve as an example of a community-based project where teachers and community members are involved as agents of change, and provide guiding principles that may be utilised by others who become involved in school-community health promotion interventions.

As such, teachers' perceptions captured in this study can be incorporated in teacher training programmes, in order to facilitate a better understanding of resource-constrained contexts and roles of schools in these areas, among future teachers. By receiving such training, future teachers may better understand the conditions in which learners in many South African schools are expected to function on a daily basis. The findings of the study also provide valuable information that may be included in the current school curriculum, in order to support healthy food consumption amongst learners, and potentially their communities. To this end, I recommend that teacher training programmes should also include one or more modules where students can explore methods through which the current curriculum can be adapted and enriched in order to address real-life problems and practical issues pertaining to the communities where they teach.

The findings of this study may furthermore suggest themes that can be incorporated into workshops for people who participate in school-based vegetable gardens, focusing on support and interventions by governmental departments, external volunteers or NGOs who attempt to establish a school-based garden. In addition, the findings of this study may serve as background for training students in education and agriculture. As part of these training programmes, a section on community-based interventions may highlight the benefits of starting a school-based vegetable garden, given the current economic situation in South Africa, where many individuals reside in resource-constrained communities, lacking adequate nutrition.

5.6.2 RECOMMENDATIONS FOR PRACTICE

I suggest that the findings of this study be practically applied in the resource-constrained communities where the study was undertaken. Even though the study focused on key role-players' perceptions on best practices for sustainable school-based vegetable gardens, the findings can be taken a step further, by arranging

information sessions and workshops for other community members of the participating resource-constrained communities. Such sessions could also involve the Departments of Health, Higher Education and Agriculture, who may present guidelines and practical skills in areas such as vegetable gardening, nutritious food choices, healthy food preparation and production.

The findings of the study can furthermore be conveyed to learners, teachers, parents and community members of similar communities, whether in a formal or informal way. In addition, such sharing of findings can be accompanied by information sharing sessions in these additional communities, thereby reaching a broader audience and informing more people of sustainable practices and ideas that may support and establish successful school- and community-based vegetable gardens.

5.6.3 RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the findings of this study, I recommend the following for further research:

- Follow-up case studies to further explore the required knowledge and skills that may affect the establishment of sustainable school-based vegetable gardens
- Follow-up case studies to further explore the facilitation of career development and entrepreneurial skills by means of school-based vegetable gardens
- An exploratory study on practical solutions to environmental challenges, as part of factors that may affect sustainable school-based vegetable gardens
- A case study focusing on the perceptions of learners regarding the value of school-based vegetable gardens
- Exploratory studies focusing on the enrichment of existing curricula in the various school phases by integrating experiential learning in school-based vegetable gardens
- A follow-up case study focusing on the model of role-player involvement and its effect on sustainability
- A follow-up case study focusing on the perceptions of teachers regarding the utilisation of learner involvement in school-based vegetable gardens
- A follow-up study to explore the manner in which communities can benefit from school-based vegetable gardens
- A follow-up case study to explore the long-term effects of sustainable school-based vegetable gardens on obesity

- A descriptive case study on the long-term effects of sustainable school-based vegetable gardens on the academic achievement of learners and the school's overall performance

5.7 CONCLUDING REMARKS

In this study I aimed to describe the perceptions of key role-players on best practices for the sustainability of school-based vegetable gardens, in a resource-constrained area in the Nelson Mandela metropolitan area. Findings confirm that school-based vegetable gardens imply benefits for learners, teachers, the school, parents and the larger community. In addition, the findings of the study highlight specific characteristics and challenges pertaining to a sustainable school-based vegetable garden, as well as basic requirements to achieve this. The study specifically highlights the need for and challenges associated with key role-players and schools pertaining to human resources, and environmental- and infrastructure-related challenges and resources to establish school-based vegetable gardens.

Following my data generation and analysis, this study provided baseline data for the development of the FIRST GATE school-based vegetable gardening manual, reflecting key role-players' voices. This study re-emphasised the potential value of school-based vegetable gardens and highlighted prominent challenges that influence the sustainability of school-based vegetable gardens. The study furthermore provides suggestions to overcome challenges and present possible ways to improve sustainability in terms of school-based vegetable gardens. Based on the reality of the South African context, the focus should perhaps fall on supporting resource-constrained communities to utilise existing resources and to learn more about initiatives that may be pursued to self-produce high quality healthy food, such as fruit and vegetables.

LIST OF REFERENCES

Adelman, S. W., Gilligan, D. O., & Lehrer, K. (2008). How effective are food for education programmes? A critical assessment of evidence from developing countries. In *Food Policy Review #9*. Washington, DC: International Food Policy Research Institute.

Addison, J. T. (1992). Urie Bronfenbrenner. *Human Ecology, 20*(2), 16-20.

Adler, P. A., & Adler, P. (1994). Observational techniques. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (pp. 377–392). Thousand Oaks, CA: Sage.

Afari-Sefa, V., Tenkouano, A., Ojiewo, C., Keatinge, J. D. H., & Hughes, J. (2012). Vegetable breeding in Africa: Constraints, complexity and contributions towards achieving food and nutritional security. *Food Security, 4*, 115-127.

Aggarwal, A., Monsivais, P., & Drewnowski, A. (2012). Nutrient intakes linked to better health outcomes are associated with higher diet costs in the US. *PLoS ONE, 7*(5), e37533. doi:10.1371/journal.pone.0037533

Agüero, J. M., Carter, M. R., & Woolard, I. (2006). *The impact of unconditional cash transfers on nutrition: The South African child support grant.* Unpublished manuscript, University of California at Riverside.

Ahlbom, A., & Norell, S. (1990) *Introduction to Modern Epidemiology*. Chestnut Hill, USA: Epidemiology Resources Inc.

Alexander, J., North, M. W., & Hendren, D. K. (1995). Master gardener classroom garden project: An evaluation of the benefits to children. *Child Environments*, *12*(2), 124-133.

Aliber, M., & Hart, T. G. B. (2010). Should subsistence agriculture be supported as a strategy to address rural food security. *Agrekon, 48*(4), 434-458.

Altman, M., Hart, T., & Jacobs, P. (2009). Household food security status in South Africa. *Agrekon, 48*(4), 345-361.

Anzman-Frasca, S., Savage, J. S., Marini, M. E., Fisher, J. O., & Birch, L. L. (2012). Repeated exposure and associative conditioning promote preschool children's liking of vegetables. *Appetite*, *58*(2), 543–553. Retrieved from http://dx.doi.org/10.1016/j.appet.201111.012.

Armstrong, D. (2000). A survey of community gardens in upstate New York: implications for health promotion and community development. *Health and Place, 6*, 319-327.

Ary, D., Jacobs, L. C., Rasavieh, A., & Sorensen, C. K. (2013). Introduction to research in education. Cengage Learning:Wadsworth.

Azuma, A., Horan, T., & Gottlieb, R. (2001). *A place to grow and a place to learn: School gardens in the Los Angeles Unified School District*. *A survey, case studies, and policy recommendations*. Los Angeles: Center for Food & Justice, Urban & Environmental Policy Institute, Occidental College.

Babbie, E. R. (2015). *The practice of social research*. Belmont, California: Wadsworth.

Babbie, E., & Mouton, J. (2001). *The practice of social research*. Cape Town, SA: Oxford University Press.

Baiphethi, M. N., & Jacobs, P. T. (2009). *The Contribution of Subsistence Farming to Food Security in South Africa*. Pretoria, SA: HSRC.

Baum, F., MacDougall, C., & Smith, D. (2006). Participatory action research. *Community health, 60*, 854-857.

Beauchamp, T., & Childress, J. (2001). *Principles of biomedical ethics.* New York, US: Oxford University Press.

Bennett, J. (2003). *Review of School Feeding Projects*. Department for International Development, London.

Berg, B. L. (2004). *Qualitative research methods* (5th ed.). California State University: Pearson.

Bhana, A. (2006). Participatory action research: A practical guide for realistic radicals. In M. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in Practice: Applied methods for the social sciences*. Cape Town, SA: University of Cape Town Press.

Birky, J., & Strom, E. (2013). Urban perennials: how diversification has created a sustainable community garden movement in The United States. *Urban Geography*, *34*(8), 1193-1216. doi: 10.1080/02723638.2013.784086

Blair, D. (2009). The child in the garden: An evaluative review of the benefits of school gardening. *The Journal of Environmental Education*, *40*(2), 15-38.

Blair, D., Giesecke, C., & Sherman, S. (1991). A dietary, social and economic

evaluation of the Philadelphia Urban Gardening Project. *Journal of Nutrition Education*, *23*, 161–167.

Bless, C., Higson-Smith, C., & Sithole, S. L. (2013). *Fundamentals of social research methods: an African perspective.* Cape Town, SA: Juta.

Block, K., Gibbs, L., Staiger, P. K., Gold, L., Johnson, B., Macfarlane, S.,… Townsend, M. (2012). Growing community: the Impact of the Stephanie Alexander Kitchen Garden Programme on the social and learning environment in primary schools. *Health Education and Behavior, 39*, 419-432.

Borg, S. (2001). The research journal: a tool for promoting and understanding researcher development. *Language Teaching Research, 5*(2), 156-177.

Bouis, H. E., Eozenou, P., & Rahman, A. (2011). Food prices, household income, and resource allocation: socioeconomic perspectives on their effects on dietary quality and nutritional status. *Food and Nutrition Bulletin, 32*, 14–23.

Bourne, L. T., Lambert, E. V., & Steyn, K. (2002). Where does the black population of South Africa stand on the nutrition transition? *Public Health Nutrition, 5*(1A), 157-62. doi:1079/PHN2001288

Boyatzis, R. E. (1998). Transforming Qualitative Information. Sage: Cleveland

Bradshaw, D., Schneider, M., Norman, R., & Bourne, L. T. (2006). Mortality patterns of chronic diseases of lifestyle in South Africa. In K. Steyn, J. Fourie & N. Temple (Eds.), *Chronic Diseases of Lifestyle in South Africa* (pp. 58–64). Tygerberg: `1Medical Research Council.

Braun, V., & Clarke, V. (2006) Using thematic analysis in psychology. *Qualitative Research in Psychology*, *3*(2), 77-101.

Bremner, E., & Pusey, J. (1990). *Children's Gardens: A Field Guide for teachers, parents and volunteers* (3rd ed.). Oakland, CA: University of California Cooperative Extension, common Ground Garden Programme.

Briggs, B. (2008). *School Feeding Programmes: summary of the literature and best practices.* Village Hope Tech.

Briggs, M., Fleschhacker, S., & Mueller, C. G. (2010). Position of the American Dietetic Association, School Nutrition Association, and Society for Nutrition Education: Comprehensive school nutrition services. *Journal of Nutrition Education and Behaviour, 42*(6), 360–71. doi:10.1016/j.jneb.2010.08.007.

Brinkman, H. J., de Pee, S., Sanogo, I., Subran, L., & Bloem, M. W. (2010). High food prices and the global financial crisis have reduced access to nutritious

food and worsened nutritional status and health. *The Journal of nutrition*, *140*(1), 153S-161S.

Broadway, M. J., & Broadway, J. M. (2011). Green Dreams: promoting urban agriculture and the availability of locally produced food in the Vancouver metropolitan area. *Focus on Geography, 54*, 33-41.

Bromley, D. B. (1991). Academic contributions to psychological counseling: A philosophy of science for the study of individual cases. *Counseling Psychology Quarterly, 3*(3), 299-307.

Bronfenbrenner, U. (1977). Toward an experimental ecology of human development. *American Psychologist*, *32*(7), 513.

Bronfenbrenner, U. (1978). The Social Role of the Child in Ecological Perspective/Die soziale Rolle des Kindes in ökologischer Perspektive. *Zeitschrift für Soziologie*, *7*(1), 4-20.

Bronfenbrenner, U. (1979). *The ecology of human development: Experiments by nature and design.* Cambridge, MA: Harvard University Press.

Bronfenbrenner, U. (1986). Ecology of the family as a context for human development: Research perspectives. *Developmental Psychology*, *22*(6), 723.

Bronfenbrenner, U., & Morris, P. A. (2006). The bioecological model of human development. *Handbook of Child Psychology*. DOI: 10.1002/9780470147658

Brown, K., & Jameton, A. (2000). Public health implications of urban agriculture. *Journal of Public Health Policy*, *21*, 20–39.

Brunotts, C. M. (1998). *School gardening: A multifaceted learning tool. An evaluation of the Pittsburgh civic garden center's Neighbors and Schools gardening together* (Unpublished masters thesis). Duquesne University, Pittsburgh.

Bryman, A. (2001). *Social Research Methods*. London, UK: Oxford University Press.

Brynjegard, S. (2001). *School gardens: Raising environmental awareness in children* San Rafael, CA: School of Education, Dominican University of California. Retrieved from http://edres.org/eric/ED452085.htm

Bureau of planning and sustainability. (2011). *Urban food zoning code update concept report.* Retrieved from www.portlandonline.com/bps/foodcode

Byrne, M. (2001). Disseminating and presenting qualitative research findings. *AORN Journal, 74*(5), 731-732.

Cameron, A., Welborn, T., Zimmet, P., Dunstan, D., Owen, N., Salmon, J., … Shaw, J. (2003). Overweight and obesity in Australia: the 1999-2000 Australian diabetes, obesity and lifestyle study (AusDiab). *Medical Journal of Australia, 178*, 427-432.

Chacko, T. V. (2013). Use of qualitative analysis to supplement program evaluation of a faculty development program. *Archives of Medicine and Health Sciences*, *1*(1), 67.

Chambers, R. (2003). *Whose reality counts? Putting the first last.* London: ITDG Publishing.

Chambers, R. (2012). Sharing and co-generation Knowledges: Reflections on experiences with PRA 1 and CLTS 2*. IDS Bulletin, 43*(3), 71-87.

Chesebro, J. W., & Borisoff, D. J. (2007). What makes Qualitative Research Qualitative? *Qualitative Research Reports in Communication, 8*(1), 3-14. doi: 10.1080/17459430701617846

Chomitz, V. R., McGowan, R. J., Wendel, J. M., Williams, S. A., Cabral, H. J., King, S. E., … Hacker, K. A. (2010). Healthy Living Cambridge Kids: a community-based participatory effort to promote healthy weight and fitness. *Obesity, 18*, S45-S53.

Clarke, V., & Braun, V. (2013). Teaching thematic analysis: Overcoming challenges and developing strategies for effective learning. *The Psychologist, 26*(2), 120-123.

Clark, L., & Zimmer, L. (2001). What we learnerd from a photographic component in a study of Latino children's health. *Field Methods, 13*(4), 3030-328.

Collins English Dictionary (n.d.). *Complete & Unabridged* (10th Ed.). Retrieved from Dictionary.com website: http://dictionary.reference.com/browse/roleplayer

Conway, G. R. (1985). Agroecosystem analysis. *Agric. Administration 20*, 1–25.

Cornwall, A., & Pratt, G. (2010). The use and abuse of participatory rural appraisal: Reflections from practice. *Agriculture and Human Values, 28*(2), 263-272.

Creswell, J. W. (2007). *Qualitative inquiry and research design: Choosing among five approaches* (2nd ed.). Thousand Oaks, CA: Sage.

Creswell, J. W. (2009). *Research Design: Qualitative, Quantitative, and Mixed Methods Approaches* (3rd ed.). Los Angeles, US: Sage Publications.

Creswell, J. W. (2013). *Qualitative inquiry and research design. Choosing among five approaches* (3rd ed.). Thousand Oaks, CA: Sage.

Darmon, N., & Drewnoski, A. (2015). Contribution of food prices and diet cost to socioeconomic disparities in diet quality and health: A systematic review and analysis. *Nutrition Reviews, 73*, 643-660.

Davis, J. N., Spaniol, M. R., & Somerset, S. (2014). Sustenance and sustainability: Maximizing the impact of school gardens on health outcomes. *Public Health Nutrition, 18*, 2358–2367.

Davis, J. N., Ventura, E. E., Cook, L. T., Gyllenhammer, L. E., & Gatto, N. M. (2011). LA Sprouts: A gardening, nutrition, and cooking intervention for Latino youth improves diet and reduces obesity. *Journal of the American Dietetic Association, 111*(8), 1224-1230.

Denzin, N. K., & Lincoln, Y. S. (2005). *Handbook of Qualitative research* (2nd ed.). Thousand Oaks, CA: Sage.

Denzin, N. K., & Lincoln, Y. S. (2011). Disciplining the practice of qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *The Sage Handbook of Qualitative Research* (4th ed., pp. 1-20). Thousand Oaks, CA: Sage.

Department of Basic Education (2014). *Annual Report 2013/2014.* Pretoria, SA: Department of Basic Education.

Department of Basic Education (2015). *National School Nutrition Programme.* Pretoria, SA: Government Printers. Retrieved from http:/www.education.gov.za/Programmes/NationalSchoolNutrition

Department of Education (1994a). *National School Nutrition Program (NSNP).* Pretoria, SA: Government Printers.

Department of Education (2008). *National School Nutrition Programme 2007/2008 financial year report for sustainable food production in schools.* Pretoria, SA: National Department of Education.

Department of Health. (2008). *Integrated Nutrition Programme. A foundation for life.* (Issue 5). Pretoria: South African Department of Health.

Devereux, S., & Sabates-Wheeler, R. (2011). Transformative social protection for Africa's children. In S. Handa, S. Devereux & D. Webb (Eds.), *Social Protection for Africa's Children*. Milton Park: Routledge.

Devine, C., Wolfe, W., Frongillo, E., & Bisogni, C. (1999). Life-course events and experiences: Association with fruit and vegetable consumption in three ethnic groups. *Journal of the American Dietetics Association*, *99*, 309–405.

Dimova, R. (2015). The welfare impact of rising food prices. *IZA World of Labor, 135*. doi: 10.15185/izawol.135

De Weerd-Nederhof, P. C. (2001). Qualitative case study research: The case of a PhD research project on organising and managing new product development systems. *Management Decision, 39*(7), 513-538.

Duncan, N., Bowman, B., Naidoo, A., & Roos, V. (2007). *Community Psychology analysis, context and action.* Cape Town, SA: UCT Press.

Earthworks. (2004). *Outdoor classrooms.* Retrieved June 8 from http://www.earthworksboston.org/outdoorclassrooms

Easter, M. M., Davis, A. M., & Henderson, G. E. (2004). Confidentiality: More than a linkage file and a locked drawer. *IRB Ethics and Human Research*, *26*(2), 13-17.

Ebersöhn, L., Eloff, I., & Ferreira, R. (2007). First steps in action research. In Maree, K. (Eds.), *First steps in Research*. Pretoria, SA: Van Schaik Publishers.

Edwards, D. J. A. (1998). Types of case study work: A conceptual framework for case-based research. *Journal of Humanistic Psychology, 38*(3), 36-70.

Eisenhardt., K. M. (1989). Building theories from case study research. *Academy of Management Review, 14*(4), 532-550.

Ellingson, L. L. (2009). Engaging crystallization in qualitative research: An introduction. Thousand Oaks, CA: Sage.

Faber, M., & Laurie, S. M. A. (2011). Home gardening approach developed in South Africa to address vitamin A deficiency. In B. Thompson & L. Amoroso (Eds.), *Combating micronutrient deficiencies: Food-based approaches* (pp. 163-182). FAO and CABI bookshop.

Faber, M., Witten, C., & Drimie, S. (2011). Community-based agricultural interventions in the context of food and nutrition security in South Africa: A Nutritional Intervention Research Unit, Medical Research Council. *South African Journal of Clinical Nutrition, 24*(1), 21-30.

Faber, M., & Wenhold, F. (2007). Nutrition in contemporary South Africa. *Water SA, 33*(3), 393–400.

Faddegon, P. A. (2005). *The kids growing food school gardening program: Agricultural literacy and other educational outcomes* (Doctoral dissertation). Cornell University, Ithaca, NY.

Farquhar, S. A., Parker, E. A., Schulz, A. J., & Israel, B. A. (2006). Application of qualitative methods in program planning for health promotion interventions. *Health Promotion Practice, 7*(2), 234-242. doi:10.1177/1524839905278915

Feeley, A., Musenge, E., Pettifor, J. M., & Norris, S. A. (2012). Changes in dietary habits and eating practices in adolescents living in urban South Africa: The birth to twenty cohort. *Journal of Nutrition, 28*(7-8), e1-e6. doi:10.1016/j.nut.2011.11.025

Ferreira, R., Botha, K., Ebersöhn, L., Fraser, W., Mauki, C., & De Bruin, J. (2016). School-based vegetable gardens: a guide to sustainable practices. Faculty of Education, UP.

Ferreira, R. (2015). *Capitalising on the benefits of participatory research partnerships to promote health and well-being in vulnerable communities*. Proceedings of the 15th International Academic Conference, Rome, 14 April, 2015 (pp. 337-338). Retrieved from file:///C:/Users/JanineD/Downloads/proceeding-10-056-3466.pdf

Ferreira, R., & Ebersöhn, L. (2012). Formative evaluation of the STAR intervention: improving teachers' ability to provide psychosocial support for vulnerable individuals in the school community. *African Journal of AIDS Research*, *10*(1), 63–72.

Ferreira, R., Ebersöhn, L., & Botha, K. (2013). Using participatory action research to develop an HIV and Aids school plan. *South African Journal of Education, 33*(4), 1-17.

Finlay, L. (2002). Negotiating the swamp: the opportunity and challenge of reflexivity in research practice. *Qualitative Research, 2*(2), 209-230.

Food and Agricultural Oragnisation (FAO). (2005a). *Nutrition education in primary schools: The reader.* Rome: FAO. Retrieved from http://www.fao.org/3/a-a0333e.pdf

Food and Agricultural Organization (FAO). (2005b). *Setting up and running a school garden: Teaching toolkit.* Rome: FAO of United Nations in Rome.

Food and Agricultural Organization (FAO). (2010). *Setting Up and running a school Garden: Teaching Toolkit.* Rome: FAO of United Nations in Rome.

Food and Agricultural Organization (FAO). (2014). *A vegetable garden for all* (5th ed.). Rome: FAO of United Nations in Rome.

Food and Agricultural Organization (FAO). (2015). *The State of Food Insecurity in the World 2015: Taking Stock of Uneven Progress.* Rome: FAO of United Nations in Rome.

Food and Worsened Nutritional Status and Health. *Journal of Nutrition, 140*, 153S-161S. doi:10.3945/jn.109.110767

Food price monitor (2015). Markets and Economic Research Centre. National Agricultural Marketing Council. Retrieved from http://www.namc.co.za/pages/published-reports/food-price-monitoring

Galhena, D., Freed, R., & Maredia, K. M. (2013). Home garden: A promising approach to enhance household food security and wellbeing. *Agriculture & Food Security, 2*(1), 8. doi: 10.1186/2048-70102-8

Geertz, C. (1974). From the native's point of view: On the nature of anthropological understanding. In P. Rabinow & W. M. Sullivan (Eds.), *Interpretive social science: A reader*. Berkeley: University of California Press.

Gelli, A. (2010). *Food provision in schools in low and middle income countries: developing an evidence based programme framework.* The Partnership for Child Development, Working Paper No. 215.

Gibson, R., & Ferguson, E. (2008). *An interactive 24-hour Recall for Assessing the Adequacy of Iron and Zinc Intakes of Developing Countries.* Washington, DC: Harvest Plus.

Goldstein, E. B. (2010). *Sensation and Perception* (8th ed.). Wadsworth, Cengage Learning.

Goodwin, D. E. (2008). *An exploration of factors facilitating and hindering change in the teaching of botany in primary schools* (Unpublished PhD Thesis). University of Pretoria, Pretoria, South Africa.

Gorman, K. S., & Pollitt, E. (1996). Does schooling buffer the effects of early risk? *Child Development*, *67*, 314–326.

Graham, H., Beall, D. L., Lussier, M., McLaughlin, P., & Zidenberg-Cherr, S. (2005). Use of school gardens in academic instruction. *Journal of Nutrition Education Behaviour, 37*(3), 147-151.

Greenwood, D., & Levin, M. (2000). Reconstructing the relationships between universities and society through action research. In N. Denzin & Y. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 85–106). Thousand Oaks, CA: Sage.

Halcomb, E. J., & Davidson, P. M. (2006). Is verbatim transcriptions of interview data always necessary? *Applied Nursing Research, 19*(1), 38-42. doi: 10.1016/j.apnr.2005.06.001

Hall, K., & Wright, G. (2010). A profile of children living in South Africa in 2008. *Studies in Economics and Econometrics*, *34*(3), 45-68.

Hargreaves, A. & Fullan, M. (2012). *Professional capital: Transforming teaching in every school.* New York, NY: Teachers College Press.

Harris, J. L., Bargh, J. A., & Brownell, K. D. (2009). Priming effects of television food advertising on eating behavior. *Health Psychology, 28*(4), 404-413.

Hedley, A., Ogden, C., Johnson, C., Carroll, M., Curtin, L., & Flegal, K. (2004). Overweight and obesity among U.S. children, adolescents, and adults, 1999-2002. *Journal of the American Medical Association*, *291*(23), 2847-2850.

Heim, S., Bauer, K. W., Stang, J., & Ireland, M. (2011). Can a community-based intervention improve the home food environment? Parental perspectives of the influence of the delicious and nutritious garden. *Journal of Nutrition Education and Behavior, 43*, 130-134.

Heim, S., Stang, J., & Ireland, M. (2009). A garden pilot project enhances fruit and vegetable consumption among children. *Journal of the American Dietetic Association, 109*, 1220-1226.

Hendriks, S. (2005). The challenges facing empirical estimation of household food (in)security in South Africa, *Development Southern Africa*, 22(1), 103-123.

Hendriks, S. (2014). Food security in South Africa: Status quo and policy imperatives, *Agrekon*, *53*(2), 1-24.

Henning, E., van Rensburg, W., & Smit, B. (2004). *Finding your way in qualitative research.* Pretoria, Van Schaik.

Hermann, J. R., Parker, S. P., Brown, B. J., Siewe, Y. J., Denney, B. A., & Walker, S. J. (2006). After-school gardening improves children's reported vegetable intake and physical activity. *Journal of Nutritional Education Behavior, 38*, 201-202.

Houser, R. (2009). Counseling and educational research: Evaluation and application (2nd ed.). Los Angeles: Sage.

Hungerford, H. R., & Volk, T. L. (1990). Changing learner behaviour through environmental education. *Journal of Environmental Education*, *21*(3), 8-21.

Hussein, K. (2002). Food security: Rights, livelihoods and the World Food Summit–five years later. *Social Policy & Administration*, *36*(6), 626-647.

Husserl, E. (1965). *Phenomenology and the crisis of philosophy*. New York: Harper Torchbooks.

Hussey, J., & Hussey, R. (1997). *Business Research: A practical guide for undergraduate and post-graduate students*. London: MacMillan Press Ltd.

Hutchinson, J., Christian, M. S., Evans, C. E. L., Nykjaer, C., Hancock, N., & Cade, J. E. (2015). Evaluation of the impact of school gardening interventions on children's knowledge of and attitudes towards fruit and vegetables. A cluster randomised controlled trial. *Nutritional Epidemiology Group*, *91*, 405–414.

Institute of Medicine (IOM). (2002). *Dietary Reference Intake for Energy Carbohydrates, Fibre, Fat, Fatty Acids, Cholesterol, and Protein and Amino Acids*. Food and Nutrition Board, Washington DC: National Academy Press. Retrieved from <http//www.nap.edu

Ivers, L. C., & Cullen, K. A. (2011). Food insecurity: special considerations for women, *The American Journal of Clinical Nutrition*, *94,* 1740–1744.

Jackson, A., Ashworth, A., & Khanum, S. (2006). Improving child survival: Malnutrition task force and the paediatrician's responsibility. *Archives of Disease in Childhood, 91*(8), 706-710. Retrieved from https://doi.org/10.1136/adc.2006.095596

Jacobs, B. M., Aliber, M., & Oyelana, A. A. (2016). Investigating the Contribution of Home Gardening to Household Food Security with regard to Dietary Diversity. *Journal of Human Ecology, 55*(1,2), 80-91.

James, W., Nelson, M., Ralph, A., & Leather, S. (1997). Socioeconomic determinants of health. The contribution of nutrition to inequalities in health. *British Medical Journal, 24*(314), 1545-1549.

Jamieson, J. P., Nock, M. K., & Mendes, W. B. (2012). Mind over matter: Reappraising arousal improves cardiovascular and cognitive responses to stress. *Journal of Experimental Psychology: General, 141*(3), 417-422.

Janesick, V. J. (1999). A journal about journal writing as a qualitative research technique: History, issues, and reflections. *Qualitative Inquiry, 5*(4), 505-524.

Janesick, V.J. (2001). Intuition and creativity: A pas de deux for qualitative researchers, *Qualitative Inquiry,7*(5), 531-540.

Jarrar, Y. F., & Zairi, M. (2000). Internal transfer of best practice for performance excellence: A global survey. *Benchmarking: an International Journal*, *7*(4), 239-246.

Joint WHO/FAO. (2002). *Expert Consultation on Diet, Nutrition and the Prevention of Chronic Diseases*. Geneva, Switzerland.

Kelder, S. H., Perry, C. L., Klepp, K., & Lytle, L L. (1994). Longitudional tracking of adolescent smoking, physical activity, and food choice behaviours. *American Journal of Public Health, 84*(7), 1121–1126.

Kellert, S. R. (2002). Experiencing nature: Affective, cognitive an evaluative development in children. In P. H. Kahn Jr. & S. R. Kellert (Eds.), *Children and Nature: Psychology, sociocultural and evolutionary investigations* (pp. 117-151). Cambridge, MA: MIT Press.

Kelly, K. (2006). From encounter to text: collecting data in qualitative research. In M. Terre Blanche, K. Durrheim & D. Painter. *Research in Practice: Applied methods for the social sciences.* Cape Town, SA: University of Cape Town Press.

Kennedy, G. L. (2009). *Evaluation of dietary diversity scores for assessment of micronutrient intake and food security in developing countries* (Doctoral Thesis, Wageningen University, Wageningen, Netherlands). ISBN: 978-90-8585-525-5

Kristjansdottir, A. G., Thorsdottir, I., De Bourdeaudhuij, I., Due, P., Wind, M., & Klepp, K. (2006). Determinants of fruit and vegetable intake among 11-year-old schoolchildren in a country of traditionally low fruit and vegetable consumption. *International Journal of Behavioural Nutrition and Physical Activity, 3*, 41. doi: http://dx.doi.org/10.1186/1479-5868-3-41

Kupolati, M. D., Gericke, G. J., & MacIntyre, U. E. (2015). Teachers' perceptions of school nutrition education's influence on eating behaviours of learners in the Bronkhorstspruit District. *South African Journal of Education, 35*(2), 1–10. doi:10.15700/201409161038.

Labadarios, D., Davids, Y. D., Mchiza, Z., & Weir-Smith, G. (2009). *The assessment of food insecurity in South Africa* (Unpublished paper). Centre for Poverty, Employment and Growth, Human Sciences Research Council.

Labadarios, D., Steyn, N., Maunder, E., MacIntyre, U., & Swart, R. (2001). The National Food Consumption Survey (NFCS)-children aged 1-9 years South Africa 1999. *South African Journal of Clinical Nutrition, 14*(2),16.

Laher, S., & Botha, A. (2012). Methods of Sampling. In C. Wagner, B. Kawulich & M. Garner (2012). *Doing social research: A global context.* Maidenhead: McGraw-Hill.

Lambotte, F., & Meunier, D. (2013). From bricolage to thickness: Making the most of the messiness of research narratives. *Qualitative Research in Organizations and Management: An International Journal,* 8(1), 85-100. doi:10.1108/17465641311327531

Lane, J., Wilke, R., Champeau, R., & Sivek, D. (1994). Environmental education in Wisconsin: a teacher survey. *Journal of Environmental Education, 25*(4), 9-17.

Larson, N. I., Neumark-Sztainer, D., Hannan, P. J., & Story, M. (2007). Trends in adolescent fruit and vegetable consumption. *American Journal of Preventative Medicine, 32,* 147–150.

Lee, Howard & Fowler, Susan (2002) A critique of methodologies for the comparison of organic and conventional farming systems. In: Powell, Jane et al. (Eds.) *Proceedings of the UK Organic Research 2002 Conference*, Organic Centre Wales, Institute of Rural Studies, University of Wales Aberystwyth, pp. 281-284.

Lekies, K. S., & Sheavly, M. E. (2007). Fostering children's interest in gardening. *Applied Environmental Education and Communication*, *6*(1), 67–75.

Lincoln, Y. S., & Guba, E. G. (1985). *Naturalistic inquiry.* Newbury Park, CA: Sage.

Lincoln, Y. S., & Guba, E, G. (1994). Competing paradigms in qualitative research. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research.* Thousand Oaks: Sage.

Lincoln, Y. S., & Guba, E. G. (2007). But is it rigorous? Trustworthiness and Authenticity in Naturalistic Evaluation. *New Directions for Evaluation, 114*, 15-25.

Lindegger, G. (2002). Research methods in clinical research. In M. Terre Blanche & K. Durrheim (Eds.), *Research in Practice: Applied mehods for the social sciences*. Cape Town: University of Cape Town Press.

Lineberger, S. E., Zajicek, J. M. (2000). School gardens: Can a hands-on teaching tool affect students' attitudes and behaviors regarding fruit and vegetables? *HortTechnology, 10*, 593-597.

Longman: Dictionary of Contemporary English (4th ed.). (2005). Edinburgh Gate: Pearson.

Luruli, R. E., Netshandama, V. O., & Francis, J. (2016). An improved model for provision of rural community-based health rehabilitation services in Vhembe District, Limpopo Province of South Africa. *African Journal of Primary Health Care and Family Medicine, 8*(2), 1-10. Retrieved from: http://dx.doi.org/10.4102/phcfm.v8i2.980

Mabusela, L. (1999). *Home gardens in the central region of the Eastern Cape Province, South Africa: A socio-economic study.* Agricultural University of Norway, 91.

Macklin, R. (2002). Unresolved issues in social science research. In F. Lolas & L. Agar. *Interfaces between bioethics and the empirical social sciences.* Buenos Aires: World Health Organisation and PAHO.

Madaleno, I. M. (2001). Cities of the future: Urban agriculture in the third millennium, *Food, Nutrition and Agriculture,* 29, 14-21.

Maree, K., & Pietersen, J. (2007). Sampling. In K. Maree (Eds.), *First steps in Research*. Pretoria, SA: Van Schaik Publishers.

Maree, K., & Van der Westhuizen, C. (2007). Planning a research proposal. In K. Maree (Eds.), *First steps in Research*. Pretoria, SA: Van Schaik Publishers.

Mareno, N. (2013). Parental perception of child weight: A concept analysis. *Journal of advanced nursing, 70*(1), 34-45. doi: 10.1111/jan.12143

Margarey, A., Daniels, L. A., & Smith, A. (2001). Fruit and vegetable intakes of Australians aged 2-18 years. An evaluation of the 1995 National Nutrition Survey data. *Australian and New Zealand Journal of Public Health,* 25(2), 155- 161.

Marr, M. B. (1997). Cooperative learning: A brief review. *Reading & Writing Quarterly: Overcoming Learning Difficulties*, *13*(1), 7-20.

Marshall, M. N. (1996). Sampling for qualitative research. *Family Practice, 13*(6), 522-525. Retrieved from: http://www.ncbi.nlm.nih.gov/pubmed/9023528

Marshall, C., & Rossman, G. B. (2011). *Designing qualitative research* (5th ed.), Thousand Oaks: Sage.

Martins, J. H. (2005). The household food budget of the wealthy and the poor in South Africa. *Journal of Family Ecology and Consumer Sciences, 33*, 37-45.

Mauthner, N. S., & Doucet, A. (2003). Reflexive accounts and accounts of reflexivity in qualitative data analysis, *Sociology, 37*(3), 413-31.

Mays, N., & Pope, C. (2000). Qualitative research in health care: Assessing quality in qualitative research. *British Medical Journal, 320*(7226), 50-52.

McMillan, J. H., & Schumacher, S. (2001). *Research in Education: A conceptual introduction* (5th ed.). New York: Addison- Wesley Longman.

McMillan, J., & Schumacher, S. (2014). *Research in education* (7th ed.). London, UK: Pearson Publishers.

Merriam, S. B. (1998). *Qualitative research and case study applications in education*. San Francisco: Jossey-Bass.

Merriam-Webster. (2015). Retrieved from http://www.merriam-webster.com/

Mertens, D. M. (1998). *Sampling: Definition, selection, and ethics: Research methods in education and psychology* (pp. 253-283). Thousand Oaks, CA: Sage.

Mertens, D. M. (2010). *Research and Evaluation in Education and Psychology: Integrating Diversity with Quantitative, Qualitative, and Mixed Methods* (3rd ed.). Thousand Oaks: Sage.

Molyneux, C. S., Peshu, N., & Marsh, K. (2005). Trust and informed consent: Insights from community members on the Kenyan coast. *Social Science & Medicine, 61*, 1463-1473.

Montessori, M., & Gutek, G. L. (2004). *The Montessori method: The origins of an educational innovation, including an abridged and annotated edition of Maria Montessori's The Montessori method*. Lanham, MD: Rowman & Littlefield Publishers.

Moore, L., & Tapper, K. (2008). The impact of school fruit tuck shops and school food policies on children's fruit consumption: a cluster randomised trial of schools in deprived areas. *Journal of Epidemial Community Health, 62*, 926-931. doi: 10.1136/jech.2007.070953

Morgan, P. J., Warren, J. M., Lubans, D. R., Kristen, L. S., Garbrielle, I. Q., & Collins, C. E. (2010). The impact of nutrition education with and without a school garden on knowledge, vegetable intake and preferences and quality of school life among primary-school students. *Public Health Nutrition, 13*(11), 1931-1940. doi: 10.1017/S1368980010000959

Morland, K., & Filomena, S. (2007). Disparities in the availability of fruits and vegetables between racially segregated urban neighborhoods. *Public Health Nutrition, 10*, 1481-1489.

Morland, K., Wing, S., Diez Roux, A., & Poole, C. (2002). Neighborhood characteristics associated with the location of food stores and food service places. *American Journal of Preventative Medicine, 22*, 23-29.

Morris, J. L., & Zidenberg-Cherr, S. (2002). Garden-enhanced nutrition curriculum improves fourth- grade school children's knowledge of nutrition and preferences for some vegetables. *Journal of the American Dietetic Association*, *102*(1), 91-93. Retrieved from http://dx.doi.org/10.1016/S0002-8223(02)90027-1

Morrow, S. L. (2005). Quality and trustworthiness in qualitative research in counseling psychology. *Journal of Counseling Psychology, 52*(2), 250-260. doi: 10.1037/0022-0167.52.2.250.

Moskowitz, J. M., Malvin, J. H., Schaeffer, G. A., & Schaps, E. (1983). Evaluation of a cooperative learning strategy. *American Educational Research Journal*, *20*(4), 687-696. *American Educational Research Journal, 20,* 687-696.

Mouton, J. (2001*). Understanding social research.* Pretoria: Van Schaik.

Nabarro, D. (2010). Introducing the Policy Brief–'Scaling up Nutrition': A Framework for Action. *New York: UN*.

Nadin, S., & Cassell, C. (2006). The use of a research diary as a tool for reflexive practice: Some reflections from management research. *Qualitative Research in Accounting & Management. 3*(3), 208-217.

National Gardening Association. (2000). "2000Kidsgardening.com". Retrieved from http://KIDSGARDEN@DISPATCH.GARDEN.ORG

Neathery, F. M., Glynn, J., & Long, K. (1997). Professional Development for Elementary Teachers: A Collaborative Effort Involving a University, a Forest Learning Centre, Industry, and State Agencies. *Electronic Journal of Science Education, 2*(4), 1-15.

Nieuwenhuis, J. (2007a) Qualitative research designs and data gathering techniques. In K. Maree (Eds.), *First steps in Research.* Pretoria, SA, Van Schaik Publishers.

Nieuwenhuis, J. (2007b). Analysing qualitative data. In K. Maree (Eds.), *First steps in Research.* Pretoria, SA: Van Schaik Publishers.

Nishida, C., Shrimpton, R., & Darnton-Hill, I. (2009). Landscape analysis on countries' readiness to accelerate action in nutrition. *SCN News, 37*, 4-9. Retrieved from: http://www.unscn.org/layout/modules/resources/files/scnnews37.pdf

Ochieng, J., Afari-Sefa, V., Karanja, D., Rajendran, S., Silvest, S., & Kessy, R. (2016). *Transforming smallholder agriculture in Africa: The role of policy and governance.* A paper presented at the fifth conference of the African Association of Agricultural Economists (5th CAAAE). Addis Ababa, Ethiopia.

Oelofse, A., Faber, M., Benade, J. G., Benade, A. J. S., & Kenoyer, D. G. (1999). The nutritional status of a rural community is KwaZulu-Natal, South Africa: the Ndunakazi project. *Central Afican Journal of Medicine, 45*(1) 14-19.

Orsini, F., Kahane, R., Nono-Womdim, R., & Gianquinto, G. (2013). Urban agriculture in the developing world: a review. *Agron. Sustainable Development, 33*, 695–720.

Ortlipp, M. (2008). Keeping and using reflective journals in the qualitative research process. *The Qualitative Report, 13*(4), 695-705.

Oxfam. (2014). *Hidden Hunger in South Africa: The Faces of Hunger and Malnutrition in a Food-secure Nation*. South Africa: Oxfam.

Ozer, E. J. (2007). The effects of school gardens on students and schools: conceptualization and considerations for maximizing healthy development. *Health, Education & Behavior*, *34*(6), 846-863.

Patel, L. (2015). *Social Welfare and Social Development in South Africa* (2nd ed.). Cape Town, SA: Oxford University Press.

Patton, M. Q. (1990). *Qualitative evaluation and research methods.* Newbury Park, CA: Sage.

Pelletier, D. L., Frongillo, E. A., Schroeder, D. G., Habicht, J. P. (1995). The effects of malnutrition on child mortality in developing countries. *Bull World Health Organ, 73*(4), 443-448.

Perry, C. (1998). A structured approach to presenting theses. *Australian Marketing Journal, 6*(1), 63-86.

Pollock, R. M., & Whitelaw, G. S. (2005). Community-based monitoring in support of local sustainability. *Local Environment, 10*(3), 211-228.

Ponterotto, J. G. (2005). Qualitative Research in Counseling Psychology: A Primer on Research Paradigms and Philosophy of Science. *Journal of Counseling Psychology, 52*(2), 126–136.

Popkin, B. M. (1999). Urbanization, lifestyle changes and the nutrition transition. *World Devlopment, 27*, 1905-1916.

Popkin, B. M., & Doak, C. M. (1998). The obesity epidemic is a worldwide phenomenon. *Nutrition Reviews, 56,* 106–114.

Pranis, E. (2004). *School gardens measure up: What research tells us*. Retrieved from http://www.kidsgardening.com/Dig/digdetail.taf?Type=Art&id=952

Project Food, land & People. (2000). Retrieved June 8 from http://www.foodlandpeople.org/

Ratcliffe, M. M., Merrigan, K. A., Rogers, B. L., & Goldberg, J. P. (2011). The Effects of School Garden Experiences on Middle School–Aged Students' Knowledge, Attitudes, and Behaviors Associated With Vegetable Consumption. *Society for Public Health Education, 12*(1), 36-43.

Reber A. S., Reber, E., & Allen, R. (2009). *The Dictionary of Psychology* (4th ed.). Penguin Reference Library.

Rehm, C. D., Monsivais, P., & Drewnowski, A. (2011). The quality and monetary value of diets consumed by adults in the United States. *American Journal of Clinical Nutrition, 94,* 1333-1339.

Relf, P. D. (2006). Theoretical models for research and program development in agriculture and health care: avoiding random acts of research. In *Farming for health* (pp. 1-20). Springer, Dordrecht.

Reisinger, Y., & Turner, L. (2003). Cross-cultural behaviour in tourism: Concepts and analysis. Oxford: Butterworth and Heinemann.

Richards, P. J., Farrell, C., Tomb, M., Nicholas, S. G., Williams, A. & Fletcher, T. D. (2015). Vegetable raingardens can produce food and reduce stormwater runoff. Elsevier, Urban Forestry & Urban Greening, 14, 646–654

Richter, K. & Jooste, K. (2013). The experiences of private somatology therapists on their self- management in private practice. *Health SA Gesondheid, 18*(1), 1-9. doi:10.4102/hsag.v18il.685

Richter, L. M., Rose, C., & Griesel, R. (1997). Cognitive and behavioural effects of a school breakfast. *South African Medical Journal, 87*, 93–100.

Robinson- O'Brien, R., Story, M., & Heim, S. (2009). Impact of Garden-Based Youth Nutrition Intervention Programs: A Review. *Journal of the American Dietetic Association*, *109*(2), 273-280.

Rose, D., Bourne, L., & Bradshaw, D. (2002). *Food and nutrient availability in South African households.* Cape Town: Medical Research Council. Retrieved from: http://www.mrc.ac.za/bod/foodnutrientavail.pdf

Royal Horticultural Society. (2015). *Campaign for school gardening*. Retrieved from https:// schoolgardening.rhs.org.uk/home

Rubin, A., & Babbie, E. (2014). *Research Methods for Social Work* (8th ed.). UK: Cengage Learning.

Ruel, M. T., Minot, N., & Smith, L. (2005). *Patterns and determinants of fruit and vegetable consumption in Sub-Saharan Africa: A multicountry comparison.* Background Paper for the Joint FAO/WHO Workshop on Fruit and Vegetables for Health, September 1–3, 2004, Kobe, Japan. WHO, Geneva, Switzerland.

Ryan, G. W., & Bernard, H. R. (2000). Data managementand analysis methods. In N. K. Denzin & Y. S.Lincoln (Eds.), *Handbook of qualitative research* (2nd ed.). Thousand Oaks: Sage.

Sanders, S., & McCormick, E. J. (1993). *Human factors in engineering and design.* New York: McGraw-Hill.

Sanjari, M., Bahramnezhad, F., Fomani, F. K., Shoghi, M., & Cheraghi, M. A. (2014). Ethical challenges of researchers in qualitative studies: the necessity to develop a specific guideline. *Journal of Medical Ethics and History of Medicine*, *7*, 14.

Schacter, D. (2011). *Psychology.* Worth Publishers.

Schwandt, T. A. (2000). Three epistemological stances for qualitative inquiry: Interpretivism, hermeneutics, and social constructionism. In N. K. Denzin & Y. S. Lincoln (Eds.), *Handbook of qualitative research* (2nd ed., pp. 189–213). Thousand Oaks, CA: Sage.

Sciarra, D. (1999). The role of the qualitative researcher. In M. Kopala & L. A. Suzuki (Eds.), *Using qualitative methods in psychology* (pp. 37– 48). Thousand Oaks, CA: Sage.

Seale, C. (1999). *The quality of qualitative research*. London: Sage.

Seligman, M. E. P., & Csikszentmihalyi, M. (2000). Positive psychology: An introduction. *American Psychologist, 55*, 5-14.

Shenton, A. K. (2004). Strategies for ensuring trustworthiness in qualitative research projects. *Education for Information, 22*(2004), 63-75.

Shisana, O., Labadarios, D., Rehle, T., Simbayi, L., Zuma, K., Dhansay, A., … SANHANES-Team. (2013). *South African National Health and Nutrition Examination Survey* (SANHANES 1). Cape Town: Human Science Research Council (HSRC) Press.

Sigmund, F. (1962). *Three Essays on the Theory of Sexuality*, trans. James Strachey. New York: Basic Books.

Silverman, D. (Ed.). (2016). *Qualitative research*. Sage.

Smith, J. K. (1983). Quantitative versus qualitative research: An attempt to clarify the issue. *Educational Researcher 12*, 6–13.

Smith, J.A. (2004). Reflecting on the development of interpretative phenomenological analysis and its contribution to qualitative research in psychology. *Qualitative Research in Psychology, 1*(1), 39-54.

Soanes, C., & Stevenson, A. (Eds.). (2008). *Concise Oxford English Dictionary.* United States: Oxford University Press.

Somerset, S., Ball, R., Flett, M., & Geissman, R. (2005). School-based community gardens: re-establishing healthy relationships with food. *Journal of the Home Economics Institute of Australia, 12*, 25-33.

Somerset, S., & Markwell, K. (2009) Impact of a school-based food garden on attitudes and identification skills regarding vegetables and fruit: A 12-month intervention trial. *Public Health Nutrition, 12*(2), 214-221. doi:10.1017/S1368980008003327

Stake, R.E. (1995). *The Art of Case Study Research: Perspective in Practice.* London: Sage.

Stake, R. E. (2013). Multiple Case Study Analysis. Guilford Press.

Statistics South Africa. (2013). *Millenium Developmental Goals, Country Report.* Pretoria. Retrieved from http://www.statssa.gov.za/wp-content/uploads/2014/02/MDGR_Report_2013_Final.pdf

Statistics South Africa. (2008). *Income and expenditure of households 2005/2006.* Available from: www.sarpn.org.za/documents/d0003023/Income_expenditure_StatsSA_2005-06.pdf

Stewart, H., & Gapp, R. (2014). Achieving effective sustainable management: A small-medium enterprise case study. *Corporate Social-Responsibility and Environmental Management, 21*(1), 52-64.

Stewart, H., Gapp, R., & Harwood, I. (2017). Exploring the alchemy of qualitative management research: Seeking trustworthiness, credibility and rigor through crystallization. *The Qualitative Report, 22*(1), 1-19. Retrieved from http://nsuworks.nova.edu/tqr/vol22/iss1/1

Steyn, K. (2006). Hypertension in South Africa. In K. Steyne, J. Fourie & N. J. Temple (Eds.), *Chronic Diseases of Lifestyle in South Africa: 1995-2005* (pp. 80-96). Cape Town, SA: African Medical Research Council.

Steyn, N. P., Bradshaw, D., Norman, R., & Joubert, J. D., et al. (2006). Cape Town: South African Medical Research Council. Retrieved from: http://www.sahealthinfo.org/lifestyle/dietaccess.pdf

Steyn, N., Nel, J., Nantel, G., Kennedy, G., & Labaradorios, D. (2005). Food variety and dietary diversity scores in children: are they good indicators of dietary adequacy? *Public Health Nutrition*, *9*(5), 644–650.

Strauss, S., & Ziv, M. (2012). Teaching is a natural cognitive ability for humans. *Mind, Brain and Education, 6*(4), 186-196.

Subramaniam, A. (2002). Garden-Based Learning in Basic Education: A Historical Review. University of CA, Department of Human and Community Development.

Sullivan, C., Gibson, S, & Riley, S. (2012). Coming up with a research question. In C. Sullivan,S. Gibson & S. Riley (Eds.), *Doing your qualitative psychology project* (pp. 23-36). London: Sage Publications Ltd. doi: 10.4135/9781473914209.n2

Taylor, S. J., & Bogdan, R. (1998). *Introduction to qualitative research methods: A guidebook and resource* (3rd ed.). New York: Wiley.

Taylor, S. J., Bogdan, R., & DeVault, M. (2016*). Introduction to qualitative research methods, a guidebook and resource.* United States: Wiley Sons Inc.

Taylor, M., & Jinabhai, C. (2001). Working with community health workers to improve nutrition in rural KwaZulu-Natal. *Development South Africa, 18*(2), 125-140. doi: 10.1080/037/6835012004186

Terre Blanche, M., & Durrheim, K. (2002). *Research in Practice*. Cape Town: University of Cape Town Press.

Terre Blanche, M., Durrheim, K., & Kelly, K. (2006). First steps in Qualitative data analysis. In M. Terre Blanche, K. Durrheim & D. Painter. *Research in Practice.* Cape Town, SA: University of Cape Town Press.

Terre Blanche, M., & Kelly, K. (2002). Interpretive Methods. In M. Terre Blanche & K. Durrheim (Eds.) *Research in Practice: Applied methods for the social Sciences.* Cape Town: University of Cape Town Press.

Tessier, S. (2012). From field notes, to transcripts, to tape recordings: Evolution or combination? *International Journal of Qualitative Methods, 11*(4), 446-460.

The Bill of Rights of the Constitution of the Republic of South African. (1996). Government Gazette. (No. 17678). Pretoria: Government Printers.

The Chicago Council on Global Affairs (2017). *Stability in the 21st century: Global food security for peace and prosperity.* Retrieved from https://www.thechicagocouncil.org/publication/stability-21st-century-global-food-security-peace-and-prosperity

Thomas, E., & Magilvy, J. K. (2011). Qualitative rigor or research validity in qualitative research. *Peadeatric Nursing, 16*, 151-156. doi:10.1111/j.1744-6155.2011.00283

Thompson, B., & Meerman, J. (2010). *Towards Long-Term Nutrition Security: The Role of Agriculture in Dietary Diversity, Proceedings of the international symposium on food and nutrition security: Food-based approaches for improving diets and raising levels of nutrition,* Rome, FAO and Wallingford, UK, CABI.

Thornton, A. (2008). Beyond the metropolis: Small town case studies of urban and peri-urban agriculture in South Africa. *Urban Forum, 19*(3), 243-262.

Thornton, A. J., Leibbrandt, M., & Ardington, C. (2016). *Pathways to food security in South Africa: Food quality and quantity in NIDS Wave 1.* A Southern Africa Labour and Development Research Unit Working Paper Number 190. Cape Town. doi: 10.1186/2048-7010-2-8

Thorp, L., & Townsend, C. (2001). Agricultural education in an elementary school: An ethnographic study of a school garden. *Proceedings of the 28th Annual National Agricultural Education Research Conference in New Orleans, LA* (pp. 347-360). Retrieved from http://www.aaaeonline.org/conference_files/758901

Tivy, J., & O'Hare, G. (1982). *Human impact on the eco-system.* Edinburgh: Oliver and Boyd.

Tobin, G. A., & Begley, C. M. (2004). Methodological Rigour within a Qualitative Framework. *Journal of Advanced Nursing, 48*, 388-396. Retrieved from http://dx.doi.org/10.1111/j.1365-2648.2004.03207.x

Tompson, B., & Amoroso, L. (2014). *Nutrition Division, Food and Agriculture.* Rome, Italy: Organization of the United Nations.

Torheim, L. E., Barikmo, I., Parr, C., Hatloy, A., Ouattara, F., & Oshaug, A. (2003). Validation of food variety as an indicator of diet quality with a food frequency questionnaire for Western Mali. *European Journal of Clinical Nutrition, 57*, 1283-1291.

Tracy, S. J. (2010). Qualitative Quality: Eight "Big-Tent" Criteria for Excellent Qualitative Research. *Qualitative Inquiry, 16*(10), 837-851. doi.10.1177/1077800410383121

Trickett, E. J. (1996). A future for community psychology: The contexts of diversity and the diversity of contexts. *American Journal of Community Psychology, 24*(2), 209-234.

Trickett, E. J., Kelly, J. G., & Vincent, T. A. (1985). The spirit of ecological inquiry in community research. In E. C. Susskind & D. C. Klein (Eds.), *Community research, methods, paradigms and applications* (pp. 283-333). New York: Praeger.

Tucker, L. (2002). Get down and dirty: Try the green thumb health plan. *Prevention*, *54*(7), 45.

Twiss, J., Dickinson, J., Duma, S., Kleinman, T., Paulsen, H., & Rilveria, L. (2003). Community gardens: Lessons learned from California Healthy Cities and Communities. *American Journal of Public Health*, *93*(9), 1435-1438.

United Nations (2010). A new deal for school gardens. *Food and agricultural organization of the United Nations.* United Nations: New York.

United Nations (2013). *Millennium Development Goals Report*. United Nations: New York.

United Nations Department of Social and Economic Affairs (2015). *Sustainable development knowledge platform.* Retrieved from https://sustainabledevelopment.un.org/sdgsproposal

University of Pretoria (2017). *Code of ethics.* Retrieved from University of Pretoria website: http://www.library.up.ac.za/research/docs/code_ethics.pdf

Van der Riet, M., & Durrheim, K. (2008). Putting design into practice: Writing and evaluating research proposals. In M. T. Terre Blanche, K. Durrheim & D. Painter (Eds.), *Research in practice: Applied methods for the social sciences* (pp. 80–112). Cape Town, SA:University of Cape Town.

Vesilind, E. M., & Jones, M. C. (1998). Gardens or graveyards? Science education reform and achool culture. *Journal of Research in Science Teaching*, *35*, 757-775.

Victora, C. G., Adair, L., Fall, C., Hallal, P. C., Martorell, R., Richter, L., Sachdev, H. S. (2008). Maternal and child undernutrition: Consequences for adult health and human capital. *Lancet, 371*, 340–357.

Viola, A. (2006). Evaluation of the outreach school garden project: building the capacity of two Indigenous remote school communities to integrate nutrition into the core school curriculum. *Health Promotion Journal of Australia*, *17*(3), 233-239.

Wagner, C., Kawulich, B. B., & Garner, M. (2012). Doing Social Research: A Global Context. Berkshire: McGraw-Hill.

Wallace, B. C. (2008). Introduction to the Inaugural Issue of The Journal of Equity in Health*. The Journal of Equity in Health, 1*(1), 1-6.

Wassenaar, D. R. (2006). Ethical Issues in Social Science Research. In M. Terre Blanche, K. Durrheim & D. Painter. *Research in Practice.* Cape Town, SA. University of Cape Town Press.

World Food Programme (2009). *Comprehensive Food Security and Vulnerability Analysis Guidelines.* Rome: WFP (pp. 356).

World Food Programme (2011). *Two Minutes to Learn About School Meals*. World Food Programme, Washington DC.

World Health Organization (WHO). (1990). *Diet, nutrition and the prevention of chronic diseases: Report of WHO study group.* WHO technical series report no 797. Geneva: WHO. Available from: http://www.who.int/hpr/NPH/docs/who_fao_expert_report.pdf

World Health Organization *(*1998*). Obesity: preventing and managing the Global Epidemic. Report of a WHO Consultation on Obesity.* Geneva, Switzerland: World Health Organization.

World Health Organization. (2003). The World Health Report 2003: Shaping the future. WHO Library Cataloguing-in Publication Data: World Health Organization. Retrieved from: http://www.who.int/whr/2003/en/whr03_en.pdf?ua=1

World Health Organization. (2006). Nutrition-friendly school initiatives. A school-based programme to address the double burden of malnutrition. http://www.who.int/nutrition/topics/NFSI_Briefing

Wright, C. M., Parker, L., Lamont, D., & Craft, A. W. (2001). Implications of childhood obesity for adult health: Findings from the thousand families cohort study. *BMJ, 323*(7323), 1280-1284.

Wright, W., & Rowell, L. (2010). Examining the effect of gardening on vegetable consumption among youth in kindergarten through fifth grade. *Wisconsin Medical Journal*, *109*(3), 125-129.

Yin, R. K. (2003). *Case study Research: Design and Methods*. Thousand Oaks, CA: Sage Publications.

Yuan, Y. (2001). An inquiry into empirical pragmatics data-gathering methods: Written DCTs, oral DCTs, field notes, and natural conversations. *Journal of Pragmatics, 33*(2), 271-292.

APPENDICES

APPENDIX A

PERMISSION TO CONDUCT RESEARCH (EASTERN CAPE DEPARMENT OF EDUCATION)

Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

Private Bag X3931, North End 6056 Sutton Road Sidwell, Port Elizabeth, *REPUBLIC OF SOUTH AFRICA*
☎ +27 (0)41 403 4559 Fax (041) 403 4461 Email: chris007a@gmail.com
PORT ELIZABETH DISTRICT: INSTITUTIONAL DEVELOPMENT MANAGEMENT SUPPORT & GOVERNANCE- COMPONENT

TO	**Prof R. Ferreira** **University of Pretoria**
FROM	**Mr N.E. Lukwe - CES – IDMS&G** **Ms L. Goba – CES - ESSS**
DATE	22 September 2015
SUBJECT	Utilisation of school-based vegetable gardens to support food security and resilience in poverty stricken communities.

Prof Ferreira

I hereby wish to thank you for choosing schools in Port Elizabeth District to be part of the school based vegetable gardens programme. We believe that the initiative will empower learners in providing fresh vegetables on the school premises.

Please provide the District with details of dates that you will be visiting the schools to inform the schools to make arrangements to receive you at the school.

The EDO's of the following schools will be informed of the programme.

Cebelihle Primary	- Ms J. Sauer
Charles Duna Primary	- Mr W. Ah Shene
Elukholweni Primary School	- Ms P. Mbusi
Seyise Primary	- Mr W. Ah Shene
Walmer Primary School	- Ms J. Sauer

Best wishes for the programme.

Kind regards

Mr N.E. Lukwe
(CES – IDMS&G

Province of the
EASTERN CAPE
DEPARTMENT OF EDUCATION

✉ Private Bag X3931, North End 6056/ Sutton Road Sidwell, Port Elizabeth, *REPUBLIC OF SOUTH AFRICA*
☎ +27 (0)41 403 4559 Fax (041) 4O3 4461 Email: chris007a@gmail.com
PORT ELIZABETH DISTRICT: INSTITUTIONAL DEVELOPMENT MANAGEMENT SUPPORT & GOVERNANCE- COMPONENT

DATE	TO
27 July 2015	Prof R. Ferreira

Prof R Ferreira

I hereby wish to thank you for the update regarding the implementation of vegetable garden project in the schools in the Port Elizabeth District. As a part of the nutrition programme in schools ms Sishi the co-ordinator encourage schools to produce their own fresh vegetables in the school garden.

Thank you for providing me with the proposal regarding the project. I am sure that the proposed programme will ensure that schools will be able to run a vegetable garden that will contribute towards the content of the ingredients needed by schools in the meals prepared at schools.

I wish you well with your preparations for the programme and hope that it will be well received by the schools who take part in the project.

Kind regards

C.R. Muller

(Circuit Manager – Circuit 5)

APPENDIX B

LETTER OF INFORMED CONSENT (TEMPLATE)

Dear Sir/Madam

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

You are invited to participate in a research project where our goal is to investigate how school-based vegetable gardens can support vulnerable individuals and communities. The project forms part of the STAR and SHEBA projects, which have been undertaken in your school or community in previous years, and have assisted teachers and volunteers to support their communities. One of the ways of support that your school has initiated was a school-based vegetable garden, which we would like to know more about.

Your participation in this research project is voluntary and you may thus withdraw from the project at any time if you wish to do so. All information you provide will be treated as confidential and your name will not be made public to anyone or when we present the findings of the project. We will use pseudonyms to protect your identity. You will also not be asked to provide any information that could result in your identity being made public. You will have full access to the collected data during your involvement, as well as to the final results of the project. The collected data will be stored in a safe place at the University of Pretoria for 15 years. As this is a funded project data will also be available in an open repocitory for public and scientific use where needed.

For the purposes of the study you will be requested to participate in workshop sessions, taking the form of group discussions and some writing/drawing activities, which will be recorded in the form of posters, photographs and audio-recordings. For these workshop sessions you will be asked to tell us about your involvement in your school's vegetable garden, what has worked over the years and what you have experienced as challenging.

The benefit of this study is that the findings will be used to inform other schools in the area about considerations they should keep in mind when starting and maintaining a school-based vegetable garden. For this purpose we will rely on the knowledge you share with us to inform other schools about your best practices and your lessons learnt. For you, a benefit entails that you may gain additional knowledge and skills during discussions, that you can apply in future. We do not foresee any risks, will respect your dignity at all times and not harm you in any way.

If you are willing to participate in this study, please sign this letter to indicate your consent, that means that you agree to participate willingly and that you understand that you may withdraw from the project at any time. Under no circumstances will your identity be made known to others. If however, you would like your face to be shown when photographs are published, kindly tick the relevant block below.

.....Warm wishes

Ronél Ferreira, Liesel Ebersöhn, William Fraser and Postgraduate students
Telephone 083 258 7747

ronel.ferreira@up.ac.za

YES	NO

My face may be shown on photographs

Participant's signature…… Date:……

Researcher's signature…… Date:……

Witness' signature…… Date:……

APPENDIX C

CODING OF TRANSCRIPTS OF FIELD VISITS

THEMES	SUB-THEMES
Theme 1: **Value of school-based vegetable gardens**	**Sub-theme 1.1: Providing food and nutrition** **Sub-theme 1.2: Skills acquisition** **Sub-theme 1.3: Practical application of the curriculum**
Theme 2: **Sustaining school-based vegetable gardens**	**Sub-theme 2.1: Mobilising human resources** **Sub-theme 2.2: Attending to environmental conditions** **Sub-theme 2.3: Establishing the required infrastructure** **Sub-theme 2.4: Accessing and enhancing knowledge** **Sub-theme 2.5: Continued planning and monitoring**

See chapter 4 for detailed themes, sub-themes and coding.

SCHOOL 1

Ingredients of a successful garden

Researcher: Ok, so you have baked a cake before right? Have you ever made a cake before, or a muffin or a scone? So, I'm gonna use a picture of baking a cake to help us think about what we must put into a garden as well to make it work. For us to make a cake, you need a few things to put in to make it work

Participants: Milk, butter, eggs, water, oil, bowl, spoon..

Researcher: Ok, so I drew a few of the ingredients that you might need to bake a cake on this. So if we make a garden right, we also need a few things to make a garden work, ok, so that's what I want you guys to think about. To draw or write, what do we need to make a garden work well. Ok, so maybe let's give one example…what do we need for a garden?

Participants: Tools

Researcher: Tools, exactly so you'll draw or write a few tools, everything you can think of to make a garden work, ok? So I'll give each of you a paper like this and I'll give you pens and things to write with.

Give participants time to discuss and write

Researcher: Ok, so lets tell each other a little bit about what we thought about, what we need to build our garden. So do you guys maybe want to start for us?

Group 1:

Participant 1: To build a garden ne, we start with manure. When we are making manure, we collect and peel vegetables and also the waste, but you cant include the filthy things like meat and manure, they decay the manure. Garden tools, fencing for

the dogs who's running around. Seeds and seedlings, manpower that is learners, parents and also teachers. Soil, fertilizer and water, the rain water, leaves for mulch and also newspapers to protect the soil when it is hot the newspapers can protect the soil, when it is cold the newspapers can also protect the soil. Gloves and overalls and pesticides, organics to control the pests.

Group 2:

Participant 2: In our group ne we said you must look for the plot first and you must not only look for the space, but for the direction of the sun, where it is coming a lot or where it is coming lesser because sun sometimes is damaging the plants. Fertilizer is needed when you build a garden. Kitchen waste, mulch, food remains, water, manure, grass and leaves. When you are doing grass cutting you must keep those and when you are leaves, you must use the leaves and also use the papers, I am just telling mulch ne, mulch with papers, not plastic, papers, grass and weeds and weeds to keep your plants warmer, because if you didn't do that your plants will burn. Then when you are having mulch under your plants it will keep your plants not to get dry quicker so your plants can grow beautiful. When we take you around we will show you what we are talking about. We also need a fork, spade, wheelbarrow, watering can, boots, hand gloves, water tanks or drums, we can also have clothing to wear when you are working in the garden so that you do ruin yours.

Participant 2: People who are going to work in the gardens, we can not be able to take a lot of numbers in one day, but we can use the learners and have a time-table for when we work. It's very important like on Monday you are going to work in the garden and do waterings in the mornings at 7 o'clock. Afternoon 5 o'clock we are going again and doing watering. And then we skip Tuesday because we cannot use a lot of watering in the garden because too much watering is also wrong. Then we go on Wednesday to look if there is no weed. Friday we can look if mulch if it is enough because you must always have enough mulch because mulch is very important to keep your garden wet.

Group 3:

Participant 3: Morning everyone, in our group firstly when we are going to start a garden, you need a workshop of how you are going to deal with a garden. You need a workshop of how to deal with a garden. You need a plot, soil and a fence. You need manure, chicken manure is very important and the waste from vegetables when you peel them, you can use manure. Tools you need a spade, fork, rake and watering can and you also need seeds and seedlings. You need safety shoes, gloves and overalls. People involved, volunteers and stake holders, that's it.

Researcher: Can I ask a question, many of you spoke about safety shoes and gloves. Where do you get that?

Participant 3: We don't have, we use plastics… we need them

Researcher1: Ok

Participant 4: But we get from public works, the volunteers and straw hats

Researcher3: And what about the seeds? Do you buy seeds or where do you get seeds

Participant 4: From the Department of Education and sometimes we buy and then there's a lady who used to come and give us the seedlings.

Researcher3: Does that work better that the seeds?

Participant 4: Ja, much better

Researcher2: So who is the lady?

Participant 4: It's a lady who helps schools

Researcher2: From a business or NGO?

Participant 4: NGO

Researcher2:And the money when you say you sometimes buy for yourself, where does that money come from?

Participant 4: From the school

Researcher2: So the principal says here's some money and go and buy

Researcher4: The two gentleman gutting the grass, are they from the department

Participant 4: No general workers from the school. So we collect the grass and we put it there for mulch

Researcher3: And things like the chicken manure, where do you get that? From a farm?

Participant 4: From outside, from the community.

Participant 1: The first time, I took money from my own pocket to buy seeds and then I sold the vegetables to the teachers and give the money to the school

Researcher2: So how many teachers and volunteers and learners work in the gardens?

Participant 1: In my class I use my learners, they are 29 in all.

Researcher2: So is it part of a learning area, or is it after school, during school or?

Participant 1: After school

Researcher2: So the class that you are responsible for, they go, so that's one class

Participant 5: The boy who came to see me just now is one of the learners who are working in the garden

Researcher3: Do you try to use the garden as part of the school work, so to use the garden to incorporate it into a lesson

Participant 6: Yes, there are many many areas

Participant 6: Yesterday there was a class there in the garden, grade 2

Researcher3: Ok, and what did you do with them?

Participant 6: They were teaching them about the soil

Researcher4: Ja, it's nice, hands on so you can see

Participant 6: Learners do go to the garden as part of their learning, for instance in grade 4 at the beginning of the year for a practical task, they do the germination of a seed…so they have to go to the garden and they have to know the types of leaves, because eh vegetables have different types of leaves, so they have to be able to differentiate…this vegetable is this type of leave and so on, so they do go to the garden for various reasons because we try to plant everything for the children to get exposure…"

Researcher3: And do they like it?

Participant 6: Jo, they are very excited.

What worked/ what didn't work

Researcher: Ok, thank you, for all of your ideas, that was a nice discussion. Ok, so back to our cake story…when you are busy baking a cake, sometimes it works well and you have a beautiful cake and sometimes something goes very wrong and then what happens? The cake falls in or it doesn't rise up like it has to and then you say, ag, I did something wrong and when it works you think yes I did everything well. So that's what we want to see. We want to see, what should we do in a garden…what happened that doesn't work in a garden…so maybe things we saw, we shouldn't do this…this does not work and here you can say, this works…if you do this the garden looks nice and it works well. So maybe think a little bit about things that you've seen that makes the garden work.

Researcher2: So what makes that the garden works well and that the plants grow with lots of produce and what makes it that the vegetable garden struggles. Because we've seen in the times that we've come, sometimes there's lots and sometimes there's less.

Give participants time to discuss and write

Group 1:

Participant 1: Problems that we had in our garden, I think is the heavy rain that will cause flooding, and the insects, because here in Charles Duna, cabbage didn't go right…always insects, yes…And I think, too much of sun rays will affect the plants. Manure… if you have manure too much in your garden, that will affect your plants. You must not use manure too much. Too strong… if…you must have a little bit., not too strong. I should think performance or attendance in the garden as we said last time, we are parents and teachers and children… if we don't go to the garden at the time-table that we have, it hat will not go right, we will be having a problem, so we must have a good performance and if we don't have enough tools, that will also cause the problem. Positive things to make our garden go right is a good involvement. If we said here, starting from today upwards every Tuesday we are going to meet and see if our garden goes right. If we didn't meet it will not work, we must love what we are doing. Garden needs someone who love it, because gardens and plants, if you don't love plants, they will not grow. Yes, you must love what you are doing… you must have passion… and to deal with this we must have insect killers, maybe in the garden. I should think that if we can have more tools in our garden, we can work and we can build our garden successfully. Plant timing of seasons… I should think now, if I'm not mistaken, it is Spring time ne …or its more… almost Spring and then we must know what to plant… if cabbage is right in Spring, then we must have that chart that is going to tell us, Summer we must plant this… winter we must plant this… like that… but if we don't have that timetable or this planning… our garden will end up fall, maybe we will

plant something that grows in Winter when it is Summer and then it cant go right. We need a planting time-table

Researcher: You spoke about the involvement and the teachers and the learners and that there's a time-table. Who set up that time-table

Participant 1: I should think we can sit in a meeting situation and then discuss it, because it cant work as individuals… maybe someone cant come on Monday, the we are doing it with the table…. We are doing it as a group.

Researcher: The one you spoke about earlier, on the other poster, you said there's already one

Participant 1: Yes we do have one as parents and volunteers

Researcher: Oh so they have one,

Participant 1: we meet every week and see we are going to do that every day, yes

Researcher: Does the school have one, for which classes go when, and what teacher does what

Participant 6: No

Researcher: You don't have it yet… so how many of the teachers take the learners in school time to the garden

Participant 6: It's the three of us

Researcher: The three of you?

Participant 6: Yes

Researcher: And no other teachers?

Participant 6 No

Researcher: Gr 4 and Gr R

Participant 6: No, grade 4 and grade 5

Researcher: Oh so it's only the senior phase, the older children who go to the garden

Researcher 2: Is it only the one class?

Participant 6: No, not all the classes, not all the children, we only choose.

Researcher: And how do you choose?

Participant 6: Those who are interested, those who have gardens in their homes, and I choose the poor ones, those who are poor. So they can get something at the end of the day

Researcher: And is that now after school or in school?

Participant 6: No after school

Researcher: So is there anybody taking the children in school time at the moment or not?

Participant 6: Yes, yes, when I want to explain, show them something

Researcher: Ok, but that is only you… but then after school it's the three of them who take some of the children.

Participant 6: yes

Researcher2: Ok, I just want to make sure, there's three ways you pick the learners, the one is, you pick them if they are poor, then some pick them when they have vegetable gardens at home…

Participant 6: yes

Researcher2: And then the others…

Participant 6: those who are interested

Researcher2: Those who are interested yes…. So how many learners all together, the total do you think?

Participant 6: For the two of us?

Researcher2: yes

Participant 6: plus minus 20

Researcher: Thanks

Group 2:

Participant 2: What went wrong ne? Heavy rain can damage the plants, insects that eat the plants, not enough manure, sunrays, lack of performance….. then here…insects have poison, ashes, enough manure, enough sun, involvement in the garden, plant according to the season

Researcher3: What is ashes?

Participant 2: From the fire

Group 3:

Participant 3: Number one this side, when things are bad it is caused by the drought, also when we give to much or little water, also the insects…the insects, ashes you can use to kill the snails, also you can feed it this side…so the lot of weeds. No fencing, so animals can pass through the garden and damage the plants. Also, exposure of weather conditions…. Birds eating the plants, spinach, cabbage and beetroot, good soil, enough water, favourable space where the plants can get enough sun, fencing, manure, irrigation, water plants in the morning and afternoon.

Researcher: I want to know about the fencing, because in the beginning you didn't have fencing and later you got fencing… do you have fencing right now?

Participant 3: Yes

Researcher: Who got you the fencing? Where did you get the fencing from, the money?

Participant 3: From the school, from the school maintenance man

Researcher: O, so the school provided it?

Participant 3: Yes

Researcher3: Ok, thank you

Seasons

Volunteer group:

Researcher3: So the last thing we want to know is, how does it work in the different seasons, so what do you do in the different seasons? So you spoke a bit about planting different vegetables in different seasons, and also what do you get in the different seasons, do you get more vegetables in some seasons… is it easier in some seasons, how does it look in different seasons for the garden? DO you understand? SO you can think a bit about how it works in the different seasons.

Researcher: So what do you do in Summer, what is the main activities that you do in Summer in the garden and what are the proceeds, what do you get? And the same in Winter, Spring and August. And this prize is not only what you get, but it can be the vegetables that you get, or you can give the vegetables away to poor families…the children can gain from the vegetables, so this trophy is actually…what is the prize? Why do you have this garden? Is it just to keep the children busy or why do you have this garden.

Researcher2: And Summer is say November, December, January, February… ja and then Autumn, March April May, Winter, June, July, August and then Spring, September October… Okay?

Researcher3: Ok, are you guys finished? Who would like to give us feedback, tell us about what you have discussed?

Participant 1: Let me first mention, we have a problem as some of the teachers of sometimes not knowing what plants to grow, or at what time. So, sometimes we just grow plants. Now in Summer, these are the things that we do, it's the preparation of soil and plant the following plants, spinach, peppers ,cauliflower, of which spinach becomes the best seller, we sell most of the spinach… these two sometimes have a problem with the peppers. Here we normally have a holiday in this time but then there is one learner who stays, Monica's son, we normally ask him to give plants water when we are on holidays. Then the problem that we experience here is too much sun, that tends to kill our plants, and too much water… and in Winter we grow spinach, pepper, spring onion. A problem we experience here is heavy rains. In Autumn it's spinach, potato, carrot, lettuce and peppers, we make a big profit on peppers, … was selling them last term, big peppers and also the spinach, and the problem that we have here is insects that tend to eat the leaves of the spinach. During Spring we grow maize, tomatoes and spinach. A problem that we have with the tomatoes is they tend to be very small. We just guess that a problem here could be that we are giving it too much water or that the soil is very wet by this time, because it is spring time, because what we experience is heavy rains and we cant go back to the garden because we don't have proper attire to work there. I used mine, and look at my shoes, I had to go to the tap and wash mine.

Researcher: Thank you

Teacher group:

Participant 3: In summer, Oct to February, we plant spinach, green beans, peppers, tomatoes and carrots. Our challenge, we use watering cans, because we are saving the water. You must pay for the service charges. And also mulch and also weeding. Our challenge in summer is sun and also water. Then in Autumn, be plant onions, potato, beetroot and turnips but our best plowing is beetroot and onion. We use mulch and watering. Our challenge is the drought because its Autumn. In Winter, we don't have time to plough in winter because we have a big challenge of windy days, flooding and also coldness, so the plants cant mature enough. In Spring time we grow maize, spring onions and avocado's. We used to harvest these things we were growing in these seasons. We watering and mulch. The challenge seasons are different and birds damaging the crops, the maize… that is all.

Participant 3: Can I say another thing. We do not do crop rotation

Researcher3: Crop rotation?

Participant 3: Yes do you understand crop rotation. Sometimes, when we have to grow plants, we find that the soil is stressed.

Researcher3: Oh, I understand

Participant 3: And also the cabbage. There are those insects that eat the cabbage. We don't have a good harvest in cabbage. We use it a lot. We cannot plant it in cold weather. And also the potatoes, it is not our best, because of the insects and also the worms.

Researcher3: Ok thank you very much, I think I'll just sum-up to make sure I have most of what you guys said. You said, what we need for a successful garden is manure, tools, fencing, seeds, manpower, soil, water, gloves and overalls and everything that you need to wear, pesticides, time-table and workshops so that you know what to do. Okay, so what doesn't work, flooding, insects, too much sun, lack of tools, performance that doesn't work well, too little or too much manure, no fencing, weeds and birds and things that damages the crops. What does work is positive involvement, insect killer, adequate tools, to know when to plant what, to have an adequate place where you have the garden and to have irrigation, so to have enough water. So what you said in the different seasons, in Summer, vegetables that work well are tomatoes, spinach, green beans, carrots and cauliflower and spinach and summer gives a good crop. In Summer you have to do weeding and mulch. The challenges are that there's too much sun and too much water and the teachers said that they get one learner to help them out in the holidays. In Autumn the vegetables are onions, turnips, beetroot, potatoes, spinach, carrot, lettuce and peppers and the challenges are that there's insects and draught. In the Winter there's peppers spring onion and spinach and the challenges are heavy rain, flooding and cold and in the Spring you grow avo's spring onion, tomatoes, spinach and maize and the challenges are that the soil might be wet or that the birds can damage the crops.

Researchers: Thank you

SCHOOL 2

Ingredients of a successful garden:

Researcher: Ok, so you have baked a cake before right? Have you ever made a cake before, or a muffin or a scone? So, I'm gonna use a picture of baking a cake to help us think about what we must put into a garden as well to make it work. For us to make a

cake, you need a few things to put in to make it work. Who is going to tell us about what you guys came up with.

Participant 1: When you want a vegetable garden, when you want to start it afresh, you want manure, we all know what manure is. You can buy it if you want or as the people do, you can use the old vegetables, whatever, then you bury them to prepare the soil.

Researcher: What did you do here at the school, is that what you did.

Participant 1: Yes that is what we do, because we don't have money to, and it's better… old grass, dry ones. Then you must have seeds, but there are people who sponsor the seeds or the schools can buy the seeds. You see the municipality in previous, they did supply us with the seeds. Then the soil, the soil needs to be checked if its right to plant the vegetables because the soil, because sometimes you have the clay soil, it's different soil. But fortunately here at school we have a good soil, the vegetable that is coming out of that soil… but now at the back we have a space for that, because here at the side you wont have space for a vegetable garden… we need water. Fortunately here at school we have that tank, the big tank, water from the rain that will help us when we run dry, you see or when the water is scarce. At the very same time we have the taps, because there is nothing we can do without water. Then the school must have equipment, because there is nothing we can do without equipment. By equipment I mean thing you are gonna use, forks, spades, rakes, because its not only gonna be one, hosepipe, watering cans, wheelbarrows because you're gonna put them, we need those, the hose, because you cant use one because there are many people who are involved, you're gonna see the human resource that we right here, teachers are very much helping. Because we know how to identify good soil and parents will come out with their knowledge that they've got of their vegetable gardens, that's why we must be able to use them, because sometimes they know better about how to plant. Then the learners we teach them, it's easy for them, some of them they do watering, but you have to teach them as educators. When the seed starts to grow you have to use watering cans, you understand, they must know from the start how to plant seeds. This is where the teachers come in to teach the learners, even the parents come in to teach the learners, so that at the end of the day even if you are not there, they will be able to help themselves.

Researcher: For your vegetable garden, where did you get these seeds?

Participant 1: The school used to buy it, but the municipality, but they were few.

Researcher: Did you write a letter and request it or…?

Participant 2: They borrowed us. The community was the involved, in the community. We made the gardens for the community. That garden was focused on the parents, we made it on behalf of them, so we were working together… we have those equipment because of the parents and we asked the parents they must bring what they have. But when they were finished with that they leave their things, because they steal from each other so its better for them when they leave they take their own. At the moment we have the challenge of the equipment, the manure we can make, the seeds, but the soil, the municipality brought us the right soil, so they brought the right soil and manure and we made our manure too, so…

Researcher: And with you it was also a combination of the teachers and the parents working together, and the learners.

Participant 1: Yes

Researcher: But the learner programme didn't work well?

Participant 1: No, because of the time, most of the time they're in class, it's when they have free periods or whatever…its only for them to know where the vegetable comes from, and sometimes we use it as a punishment.

Researcher3: And did the teachers use to take the learners as part of lessons to teach them something from the garden.

Participant 2: you know what, we as teachers divided ourselves, some were in the information, some were in the whatever, so the one's who were in the garden were getting permission from the principal to take the periods ….the learner to the garden to prepare the soil, but its not an easy thing.

Researcher3: Is it? Why was it difficult?

Participant 2: Time, and the availability of the crops.

Researcher4: You said you got soil from the municipality, how much soil did they bring?

Participant 1: A lot

Researcher4: So they mixed in the soil with the soil that you had?

Participant 1: No they covered it, on top

Researcher4: Oh they covered it

Researcher1: That was the time when it was still growing

Participant 1: Yes

Researcher2: And when there was produce, I remember some of the produce was sold, how did that work, how did you decide, did the parents decide, did you decide what to do with the produce? What worked and what didn't work?

Participant 2: Like I said, we divided the groups, the teachers into groups and then the teachers called the parents… we had our meeting first and then we called the parents, we decided with them what we were going to do with the produce and then, the deputy, kept the money that if something was stole, kept it running…and in the garden, the parents had their own plots where they could grow things for their houses and then the other was for the school so that the school could have some. We sold some, gave some to the office, others to the HIV and Aids learners and parents of the school, that's how we did it.

Participant: Sometimes the veggies also help with the nutrition, onions, and cabbage.

Participant 3: The main focus for us to make a vegetable garden is because we needed it for OC's, that's why we involved the parents; it was not for the community. Then, those sick parents, HIV positive or whatever, used to get it, because they needed nutrition, something before they take medication so that's why we started the vegetable garden, our purpose mainly was for them, then the parents benefited from that. They did not get paid for that, they had to sell it…use it at home, excess they sell it. The reason why the deputy kept some of that money, is because he wanted to keep it to generate new seed. It was for the benefit of the school, because that time in the kitchen, they had food kitchen. So the school benefited, the parents benefited, everybody benefited from that vegetable garden.

Researcher2: Did somebody keep some type of a log, how many parents involved, how much, many…

Participant 1: The coordinator, I don't know if she still has it, I'll check.

Researcher2: That will be nice

Researcher4: In the future it will be nice if you keep track of how much you grow

Participant 1: Measure it in bunches

Researcher4: You aren't making money out of this, but the benefits to the community…

Researcher2: Because it was never for the money

Participants 1: Ja

Researcher2: The money was used to support sick people, it wasn't to generate income…to provide nutrition.

What worked/ What didn't work

Researcher3: Ok, the last thing, getting back to our cake example, when you are baking cake, sometimes it works, and other times it doesn't, and then it's a disaster and it falls in, it's not a success… SO if we use that example and we look at a garden that like a cake, it fell in and it was a little bit of a failure and on this side, a successful garden that worked. What would you guys say, if you think about your garden through all these years, all the ups and downs you've been through, what worked well and what was challenges.

Researcher1: Sometimes when we came here there was lovely vegetables and other times nothing, so what worked well or what didn't work?

Participant 1: The challenges can be scarcity of water, lets say draught and in a place like this there's no way you can bring water to it. The preparation of soil, if its not well prepared the results will be poor automatically. The parents are reluctant, yeah the parents are reluctant. After the harvest, they are lazy to start, the garden afresh and another thing that makes challenges is the fencing, there is no fencing and the people are making trouble and even the animals are making troubles, yes. Another thing they steal amongst each other, the neighbours come over, if your garden is not protected, they come over and steal. Over crowding, when they are working there is too many people there is no progress. The scarcity of equipment is another factor. When a garden is good like this one automatically there is water and the soil is good like the soil we were given, and the manure – so everything is going to be perfect. Fencing to protect the crops and there are less people involved in the garden so that you can see the work there, if there are few people in the garden. The availability of equipment makes things easier for people to work there so automatically, you are going to have a garden like this one.

Participant 1: And did you see Charles Duna, they sustain their garden, do you know why?

Researcher2: Public work…

Participant 2: eh… yeah…eh the parents they were using, they weren't using the whole community, they were using like four people, it was like couples, ja two couples that would come in.

Researcher2: Mr and Mrs Brown

Participant 2: And the other gentleman that passed away, so it was sustainable, because they have to take care every morning and afternoon, but when you have over-crowding, that's when they start to talk about their problems, in the location, they bring their problems from the community and bring it there at the garden…we have to solve things, the fights that we don't know that started there at the location, so at least now we know what and what we must do, for future purposes

Researcher2:And did they tell you about the public workers, the paid public workers

Participant 2: No, no no

Researcher2: Ja, I mean that is just a brilliant strategy

Participant 2: Ja, ja, ja

Researcher2: So the Department of Public works pays them. Principle … wrote a letter to the department of public works

Participant 2: Ja we can do that

Researcher1: And the department gave them the shoes and the clothes and everything

Participant 2: Ja

Researcher2: And some of them work in the garden, but some of them clean the classrooms

Participants: It's nice. We will go and talk with them and ask how they do it and our principal can follow that

Participant 1: We can even go to public works, we can write letter to them, tell them what we are interested in .

Researcher: So is that also a challenge then? The school leadership should also be on board for the vegetable garden to work.

Participant 1: The SGB, it's their duty to check the garden, not to interfere with the life of the educators. It is their community, their children that are here, so the SGB is supposed to work closer with us. That is why I told you that we would like the mediator between us, like we did last time and the office, like the deputy, it was easy sometimes to report things to the principal. We can use our deputy also, not the whole management because we don't know their needs and wants and we don't want this to fall out, we know how to operate…The parents they know where the office is and there is involvement

Researcher3: Who should take responsibility, should it be the parents, should it be the teachers should it be the volunteer workers that the other schools have or should it be all of them, who should take responsibility for a garden to be sustainable?

Participant 1: Teachers

Participants 2: All, the team, collectively, because if we can say here that that will be the responsibility of the teachers, everybody will relax…

Participant 3: And its hard for the teachers, even weekends we are not around, even holidays we are not around…the community will assist

Participant 1: But the very people who will take care, is our group…because it will fall into our hands, we supposed to monitor, to do whatever, that we used to do.

Researcher4: What does the presence of a good school garden do?

Researcher3: Why is it good to have a good school garden

Researcher4: What does it do to the spirit of the school, and I'm leading that answer now, but does it mean anything for the school to have a well performing school garden

Researcher2: What is the benefits?

Participant 1: You know, I can say I don't think the school, needs this garden, not unless there is a thing that is there for the school to have that garden

Researcher2: Unless there's a reason, it doesn't make sense

Participant 1: Because the government is providing vegetable and everything… so why must there be a garden…but if there is a reason, like we've got the sick, we've got the orphans, we've got the vulnerable so we must have that, that is our reason.

Participant 3: I want to reason a little bit, because even in our homes we've got it. And it's good for a school to have a vegetable garden and it is very healthy, better than to go and buy the vegetable outside, the frozen ones or the vegetables outside that are not fresh, you understand? And we grew up knowing, that in our parents home, that in that house there must be a garden, so that you can cook something that is organic and fresh from the garden. So it failed, because the school didn't support, didn't know how to maintain a vegetable garden. It's only now that the things are changing that…we've got sick learners, that they don't get anything. Even with everything that we've got, its not enough. You can even look at the nutrition that the children get, it's little bit… you can see the carrot there and there and there. If we had a sustainable vegetable garden, it will help all of that…but we ran away from that, that is the good thing, that we didn't take good care of it

Participant 3: And another thing, if we have a school garden we are teaching the children a skill, they will carry their life long time. Because in the community, people are unemployed, which is the challenge, so that learner if they have a skill of plowing, they will go there at home and at their own house and that will fight the poverty that is in our community.

Participant 3: And even now there are so many sicknesses that need everyone to have a vegetable garden, because look at that lady who is the minister of Education, he talked about beetroot, it is not a joke…beetroot and spinach, which is the people who are diabetic who depend on that. Sometimes they don't have the money to buy the spinach, because spinach is very expensive, but it's easy because it takes two weeks you understand? Even on agriculture and life skill, some of them didn't do well in class, but in the vegetable garden they do well… they can be the seller of vegetables. They can plow and have a big garden, you understand? And those who cant go far away because they have a disability…its sort of a life skill

SCHOOL 3

Ingredients of a successful garden:

Group 1:

Participant 1: So our garden… to be productive we need manpower first. Manpower we are speaking about parents, learners, teachers and then we will need soil and we will prepare that soil as much as we can. Soil is like a baby it needs to be taken care of. And then you will need compost or manure. Different kinds of manure…chicken manure, horse, cow and elephant… (laughing) if it comes to it. And then we will need sufficient water so that your garden… and then we will need watering cans…and what else? Tools… to work the soil and also we also need knowledge, to work the soil. You must know crops that grow in Winter and crops that grow in summer. Also you must choose the seeds and seedling and what else? I'm sure we are done.

Researcher: I have a few questions coz we looked at the garden last time and it was really amazing so obviously you have the knowledge…where do you get that knowledge?

Participant 1: We've got a lecturer in the school, … (laughing) she's very good with that and then we Google and writing to get the knowledge. We use … as a resource person

Researcher: Ok fantastic. I have another question. The seeds and the seedlings, where did you get that?

Participant 1: Mrs … and rural development and municipality and Food and trees.

Researcher: Ok so it's outside sources that you contacted?

Participants 1: Yes, and we also buy it sometimes.

Researcher: Ok, thank you

Group 2:

Participant 2: It's my turn? Ok. Good morning everyone. Our ingredients for our garden first is passion. You can have everything but if you are not passionate about what you are doing it's gonna take you nowhere. And the other is commitment. I remember one time, mrs … had a funeral in his house but he was in the house and in the garden, because he was committed to what he was doing and then the knowledge. The knowledge is from everywhere. People think the knowledge is from books, but its even also from the community. Like they will come here and ask, Ok, what are you doing here because we've got some herbs in our garden, we plant herbs for the love of planting, because we try to plant everything for the children to get exposure. But for somebody who had never even been to school, will come and tell, please give me this certain thing because I would like to use it as a medicine. So knowledge we also try to gather as much, also from you we will try to gather some knowledge of how to go commercial of it so from everyone we try to get some knowledge. I mean if he might know nothing about the garden but he might know the marketing side of the garden, or the place where we can go so we can get some contacts, so

Researcher: So seeing opportunities and being alert

Participant 2: Yes, and then we need soil, unfortunately we don't got soil, we've got stones… but we plant on stones. Then water, compost… compost we can get it from the mulch. The grass cutting…if the school is cutting grass you collect it and keep it for….and then the other thing is a good site for your garden…for example in our school is a better site that one because it's got lots of sunlight, unlike the small one, this one can be less of….and then the other thing of the site is the wind. PE is a windy city some school you might see they are not working hard, because the site it gets blown away. And then the support from the learners and from the community. Because if you say you've got these people they are coming for a workshop and then our community and those who are working with us in the garden. If we are on holiday they can work our plants while we are still away. Or when we are still busy with exams, they will help us with some of those things. And then the department, organisation, rural development, correctional service also… those people who are on parole they come and help us with the cleaning so it is also to help them to get back into the community and to be accepted by the community. The NGOs they can also assist us, like we've got a tunnel and sometimes we run out of soil and they buy all the things for us. Then the other ingredient is expansion, our school garden, if you go there… we've got lots and lots and some of the things we don't even know by name and, we try because it's a school garden, we try to plant everything because, it's the way of showing the children what can grow, because we don't know the end… what are they going to be scientists, or agriculturalists or… so, if you go to our garden, there is a lot… so we want the learners to get as much exposure and we also if we go and visit other places and see they've got something we don't have, we try and plant it back. I think, it's the end.

Researcher: Thank you, it's amazing how the two groups actually build up a beautiful picture.

Participant 2: It's because they are doing what they are saying (laughing)

Participant 2: Can I add something? I think the background matters a lot. Because we are farmers, and then even if you are not from farmers, our parents then, likes to grow and plant right around their ground, even if they are not from farmers, so that knowledge helps us a lot, because when we are in the garden that knowledge comes back.

Researcher: That's very true

Participant 2: And then, we do intercropping, like if you think back, our parents were doing that, they were planting maize, they were planting beans, pumpkins… and then it didn't have a name, but they pulled on their own indigenous knowledge, know that id you are going to eat esopy… which uses maize and beans, you have to plant them at the same time. You are going to eat the maize and the pumpkin together so you have to plan them together. So that was their intercropping, but they didn't have that in English, it was in their indigenous language and somebody could not interpret. Now it seems in our days that it is a new thing, but it was done by our forefathers, without any terminology put in that.

Researcher: That's beautiful, I hope you got that, it's such a beautiful concept in terms of the indigenous knowledge, it's so beautiful. So a great title for an article.

Researcher: Does that mean there are some communities in PE that doesn't have that background?

Participant 2: Most of them, they've got, the thing is, if you come from a rural area and now you move to a township, and you start a garden…some in the later days, they think that you are still backwards. It's now that because of poverty…and what I love about this school, they see educated people planting, they see their clever children planting, now…it's going back that way again, in our school we also give our children some seeds, so that they can plant at home… they don't take it anymore like they are going backwards, because they are doing it in school and they are entering competitions. And they know the plants by names and they can do something about it, so it's coming back now, the household gardens are starting again. But they knew that they hated that stigma, Oe, I'm still a village farm girl in the township, but now everybody has got knowledge.

Researcher: Thank you

What worked/ what didn't work

Group 1:

Participant 1: Ok, what makes our garden nice is dedication first. You need to be there at your garden everyday, to see what's wrong, what's good, and then you make it right. Water is number 1. When you're garden is having lots of water, those plants that need lots of water, not every plant… then your garden will be ok. Compost, make your soil looking good and ready for planting. And also mulch … mulch the soil is like the blanket so when the soil is not covered the sun will damage your soil and the wind will damage your soil so by mulch your soil, with grass, cardboard, newspapers uh, your soil is going to be good and your plants will grow very well. Your seedlings, types of seeds you plant. If you plant hybrids (laughing) one time, our department rural development donated hybrid seeds to us, so our spinach was very nice and good so we appreciate that.

Researcher: Can I ask something, what is hybrid seeds?

Participant 1: It's the seeds that have the cross pollination and the cross things type of… it's a hybrid. That's the explanation we got from rural development, because we are teachers. Maybe Dr … will tell us wrong or right… (laughing)

Participant 1: Ok, thank you…and weather…if we've go good weather, then our garden will also be ok. Like … said, if our garden is on this side in the morning where the sun is there, our garden will be ok. And also, not a lot of wind… but if here in PE, we've got a lot of wind so we need windbreakers, so we plant a lot of spekboom or other trees around our garden. Uh, the challenges is weather, climate change, like this year we've got a lot of rain in PE that makes us not go into out garden every day and our garden is stoney, we've got a lot of stones there, if we've got any market for our stones, we've got a lot of money (laughing). So we are still looking of that.

Researcher: Is it a problem everywhere or just here?

Participant 1: Uh, everywhere but it is worse here, you will see them, we are packing them in the fence… along the fence. We've got a lot of stones. Uh, the availability of compost, we need to ask our compost…from the farms or the municipality and they didn't have it at the time we need it so we've got a problem of compost. Water, is a challenge also, because we've got tanks, but our gutters, we have got a challenge with the gutters and our tanks are only two. And even the way we the pipes from our tanks to our garden is not small, so we have a problem. Even in the weekends, we are not here and the learners are not here, so when the community are not here or around…

so no one is going to water our garden. Even on holidays our garden will suffer. And we've got a tunnel there in our garden, and the organisation who donated that tunnel planted that seeds in sand, so we have a problem, the plants planted in that sand were not ok, we tried to plant them in soil, then there was a little bit of change, so we've got a challenge with that tunnel and a little bit of snails… we've got a lot of snails in our garden.

Researcher: You must market that as well

Participant 1: Yes (laughing)

Researcher: Ok, who's the spoke's person in this group?

Group 2:

Participant 2: Ok, for our garden, the type of soil makes a good garden, but unfortunately we don't have it, we are making it, but we don't have it, but we have made that soil…it's no longer that… and then the weather, fortunately we had very wet weather, some other years it can be just dry. Look at the stoney soil and hot weather, so whatever we plant.. it doesn't… but this year it was fine. And then the water the teachers also…it was rainwater much of the time… and then seasonal planting. Some other people will say, their garden is not good… but it is good, because they plant… their timing is not right. And then the plants… in the cropping system…like you cant plant beans and onions, it is not good. Even if you do intercropping, like tomato, tomato goes with brussels, spinach goes with onions and chilies, to control pests… you have to intercrop something with something, and not one, should be different…we believe insects don't see they smell, so if you have different smells they…. So our garden is good, we do intercropping like we plant lettuce beetroot and onion, so the insects don't smell the same, so if they smell the thing they love they will also smell the different ones… we do intercropping. We have the different herbs, we have garlic, chili and then we also got confri and tanzi, the herbs that make good soil, and also legumes. But unfortunately this year we didn't have much of broad beans in the garden, but in summer we got a lot of sugar beans, and now we have to plant lots and lots, because in winter we didn't have broad bean and we believe legumes build the soil, fertilise the soil. It's one of our fertilisers, we also use some of the plants to fertilise our soil, confri, legumes. So, that's what makes our garden, because we have got a little bit of the knowledge of these plants that also fertilise…

Researcher: You've got a lot of knowledge, not a little bit

Participant 2: (Laughing) so, and then the time… if you have got the time, you're garden will be beautiful. But unfortunately we are teachers and we have extramural activities and you have to be present in the class. You have to make time really because one week you are absent in that garden, you go there and everything is a mess, so, the bad one is the type of soil, the wind in PE. You can have a beautiful garden, but if the wind blows in the afternoon, forget it, you will see the leaves of your spinach all brown, as if somebody was burning your garden. Then the other, we are using municipality water, and the school has to pay for the water. Fortunately we have some sweet potatoes here, they are resistant and can handle dry weather and then, we don't use commercial fetiliser because we can't afford them and you must use them now and the, so we go natural, with the mulch and herbs and compost, but the problem with the compost is the transport. The person can offer you so many bags of compost but you cant afford transport to get them here and then the challenge is the time. And then the bad seeds, we are a school, we are getting donations from all these people. But some

of the seeds we get they are expired, they are not good because it's a donation and you just want to plant because our garden is big, so the type of seed sometimes really… you can plant a big space but the produce is terrible. Then the insect, sometimes we got some… since it's a natural garden, the birds can eat… and then also we've got a lot of worms, earthworms. And then we had a worm garden, but it burned, two times. I'm still in mourning of my… the first one… I don't know what causes that…but every December when the school closes, there is a big fire. I don't know if it's somebody smoking close to them or the sun is so hot that… I don't know, but I want my worms back… if you can check funding for me to have a wendy house for them, because children is enjoying that they can have some farming in their school. Thank you.

Researcher: Can I ask you something, you speak about intercropping, do you also teach the learners about intercropping and crop rotation.

Participant 2: Yes, that is why I say, some of the schools will think, their garden is not successful, but it's because they don't know which season to plant and… like what we are doing in our garden we plant the lettuce and the beetroot and when we harvest the lettuce and beetroot, you plant something else, something like a legume… so your soil… you cant say I'm putting my soil at rest, this is dumb, you cant put your soil at rest, when people are hungry and we have a little bit. You know that when you have taken our a root one, you must plant a leafy one or a legume.

Researcher: Yes, and in your curriculum? Do the children also learn about that in the class?

Participant 2: No, that is why I say, coz we have got environmental club, we have things they are involved in. We are going to show you the file that has all that.

Researcher: Thank you

Seasons

Researcher: So I know I said that was the last one, but it seems that you know what is going on and you can help us with information on things like seasons.

Participant 2: But because of climate change there is really no seasons

Researcher, Ok, but more or less, what vegetables do you get in each season and what do you do in each season and what are the challenges?

Group 1:

Participant 1: Ok I'm going to start with Spring, since we are still in Spring. The difference now, we don't grow a lot in Summer and Winter, we harvest in Summer and in winter and then in Autumn and in Spring we plant. Then I'm gonna start with Spring, in Spring we grow carrots, onion, spinach, sweet potatoes, sugar beans, watermelon, maize, some other fruits banana, because we harvest it in summer. And then there are a lot we didn't mention, some we have in school and others we don't have. And then I want to go to sweet potato, I think it is very good for the soil as well, we didn't mention that, for the soil, it breaks the soil and prepares the soil. Since we've got this stoney soil, so if we grow sweet potato, it breaks those soil, we get the loamy soil to plant the other plants. And then when I go to summer, we harvest all these things we have grown in Spring and then in Autumn, we grow onion, sweet potato, I think it's all round. Spinach is also all round because we grow that in all seasons and then we harvest

those in Winter. The chilies also we grow that in Summer. And then in Winter we harvest chilies, broad beans, turnip, mint, coriander and camomile. We are finished in our group.

Researcher: Thank you

Group 2:

Participant 2: Ok, it's more or less the same, but with sweet potato. Sweet potatoes are good for the warm season, but they do well in our area all year round because we don't have frost, but with places with frost, it's a no crop for winter and then the other thing, some of the plants now, now that there is that global warming, you can plant some of the summer crops in winter and they will do well because we don't have that cold winter in our area and also with the help of that manure, natural compost can make wonder, so a cold plant can get warm because you are using that manure and mulch an what so most of the plants we are not used to get in winter, you can get it now, because you use you manure and mulch and some of the days are not that cold, it can be hot even in June. So there is actually not really Winter, Summer. You will learn, how is this climate change affecting your area. Because most of the plants now you can get them all year round. So this climate change has got some advantages and disadvantage. And in our area we do not always have a wet winter, but we had this year, so it was an advantage to those who have planted. SO we cant be saying we have seasons. You will see, is it wet, is it dry, is it windy. August is the windy month, but this August we didn't have any wind. But maybe in mud October we are going to use those wind breakers that you heard. You must look at what is happening in your area. It's not about the book, it's about what is happening in your area.

Researcher: Can I ask you, do you plant the orange flesh potato or is it just the normal sweet potato?

Participant 2: That's my field, I'm the orange sweet potato guru, I will show you photos.

Researcher: How many people working in the garden are teachers, how many are volunteers?

Participant 2: There were three volunteers and then the teachers and the learners.

Researcher: How do you decide which learners?

Participant 2: All the learners of the school they are supposed to be there, if this teacher wants to go she must go with her learners. If it's me, I must go with my learners, if one teacher is absent and those learners are free I send them to the garden…

Researcher: And then they work…

Participant 2: Ja, if they are not working they must collect snails, the little ones, so that is how we are fighting the snails, because we don't kill in the permaculture, we are not allowed to kill the insects.

Researcher: Is there anybody that is in charge of the garden, or is everybody just trying to help?

Participant 2: I don't know… I am the coordinator, but I am not in charge.

Researcher: And what do you do with the crops?

Participant 2: The crops, like last week we had a heritage day, we cooked all the traditional things and then we sell it and we were supplementing the school nutritional programme to have something fresh like onion and spinach in the kitchen and if there is a child that is sick, because some of our children have TB, we try to send veggies home for that child. But for the learners we give them seeds to take home, for them to learn.

Researcher: And do you sell some of the vegetables?

Participant 2: No we don't sell.

Researcher: So where do you get money to keep the garden going

Participant 2: like in permaculture, we are supposed to keep our own seeds, because what we buy most of the time, we are not sure, but the other organisations like Food and Trees they give us seeds and we keep them, like most of our things are from the previous things. But we also get from the municipality, rural development, education and what… And we buy with our money, if we see something that is in season, we buy them and make them like we saw brinjals and now we are making seedlings from the seeds so that we can…

Researcher: Do you have a problem with theft?

Participant 2: No, because the community people are planting same things as us and they are also around here. And our fencing is good, so not yet.

Researcher: Your garden is blessed

Participant 2: yes

Researcher: Ok, does anybody else have questions? Thank you so much for your time and your valuable knowledge you shared with us, we really appreciate it.

Researcher: Yes, you've given us quite a bit so, tomorrow we will be sitting and analysing everything and then next week we will be designing a proposed programme of what we think should be in the manual when you train other school and then we will come back either the 12th or the 13th just to tell you what we think we heard today and for you to say yes that was right or no, it wasn't. It wont take long. Janine will be telling you what we heard, we will be grouping the things, because we spoke a lot about the challenges in terms of the elements and we will group that and she will tell you how we grouped it and what we think, so it will take about half and hour. But thank you very much, you are amazing. I can understand why mrs … said we must come here.

Participant 2: We also have some events with our garden, for help, it's not easy to just phone somebody and say we need help so what we do is we have environmental calendar, since we are also involved with environmental groups, so if we see, its March, that will be the water month and for us to get those tanks, we must have that event, celebrating water day and then invited the rotary club and then they donated those tanks. When it's October we have well food day on the 26th, we will be harvesting those and exhibiting that and then we will get some seeds from the other department and then it was heritage… so we use that environmental calendar to make those events so that we can… host events to get donations… even for our learners now to get exposure of the career, because we invite different departments and they get… so we don't start our career guidance in high school here, we start it in lower grades.

Researcher: That's so excellent. You are well resourced. You can clearly see where your resources are. In all our projects that we do we follow a strength based approach and that basically says that we are aware of what's the problems but we are able to see there's a resource and there's a resource to access it. You are already doing that.

Participant 2: And that lady is teaching at a special school so we go to assist the other school also, because we were working with so called normal schools but we didn't see results, but with special schools, really. Those learners they can do for themselves, so I think it is nice to work with special schools.

Researcher: It's nice you have lots of networks.

Participant 2: It's the school it's not me (laughing)

Principal: On behalf of all of us, the SGB and the department of Education, we want to thank you. When you came here the first time, we were so excited and then we heard you are coming back, we are excited, we want to tell them and show them who we are. We highly appreciate our school being one of those chosen, and we are going to do our utmost best…

Researcher: You are already doing your utmost best

Principal: We say thank you

Researcher: We say thank you, we really appreciate it

Deputy from the department: On behalf of the Department we would like to thank you for the wonderful project you have brought to our district, we have learnt a lot, and from now on we will be in touch with you. We do not want the project to stop, and we will point you to other schools that show potential because it is a wonderful project, so thank you.

Researcher: Thank you

SCHOOL 4

Ingredients of a successful garden:

Participant 1: Ok if we can go to the beginning, you need a space with sun and shade, a water source, you need some form of security and you must have a fence and walk through gate. When you go back to the garden you need soil, good soil for the plants to grow in, therefore you have to upgrade your soil and for that you need compost, mulch, irrigation, minerals, soil textures.

Participant 1: you need to test your soil – first need to rehabilitate. You need to test your soil to know what you need to add to it. You need healthy soil.

Participant 1: In PE you need shelter from the wind, that's why I'm building tunnels, you need pest control and that's it

Participant 1: you need gardening tools, your rakes your spades. At least six of everything. But sometimes we work with no tools. You need a water source, like a hosepipe. We were able to set up a garden out of anything, you don't need much. You don't even need money for seeds coz one school can support the next school and give them seeds. You have to set up the garden so it can support itself and it takes a few

years to be established but it can be self supporting and then you can keep your own seed and harvest water like with gutters you can catch up rain water and store it. You can get old vegetable waste from the kitchen and use it in the worm farm and you can have your own compost heap to generate food for the garden. Our garden is a textile garden where children can play in it like a playground and we want to link it to art and sport.

Participant 1: This garden is focused inwards for the children to learn. We want our kids to take this and go grow it at home. Everything is linked to the garden, and our kids go to the township and then some of this they learn here can be lost. All of us have our own plan but all of it is linked to the sustainability. I. Have to be here every day, otherwise it wont work, I'm not kidding, the kids cant...

Participant 1: The idea is to start working with the kids

(participant 3 objects)

Participant 1: no no I know, I teach them, but if I weren't here they couldn't work in the garden on their own

Participant 3: I take them there and they work in the garden

Participant 1: O you teach them?

Participant 3: yes I teach them

Participant 1: It's a process, it takes time

Participant 1: I'm just saying, right now its not sustainable and we should teach in the classroom how important the garden is, coz they don't know right now how to do it

Participant 3: You see, we teach them in the class and then there is some days that we go to the garden and we assist. And you can even see there is a new station in front that we do, there we said to the children they must make sure that side doesn't fall. And every morning they are there watching their corner making sure it doesn't fall

Participant 1: Ja, I know, I see them, but it's a lot more complicated than that

Participant 1: If you look at schools that are in communities, it becomes a lot easier; this is an exceptional case to not have a community around you where you can get parents involved to have skill transfers. This is unique because the children live far away, so we will have to go to the children's home and teach them – that's a way to get around it. So in communities it becomes easier. In the Transkei we work with communities and we get the elders to identify the poorest people and you work together.

Participant 1: You see this school, the idea for the vegetable garden was …i's and we asked her what she needs and she said a vegetable garden and then we got in experts, coz we're not experts

Principal: Without that support we wont be here

Participant 1: So the main idea behind the vegetable garden was to teach the kids a skill, if you can teach them to plant they will never ever starve. The second things was to supplement our soup kitchen here with natural, organic veggies for healthier food for the kids because a healthier body a healthy mind.

Participant 3: And for the Gr R's you must see them, we were doing something about vegetables in the class and then we took the cabbage we took the carrots and cut it and painted, it was fun!

Participant 1: And they are learning to identify things they didn't know

Participant 1: She has planted many different things, fruit trees and nuts and medicinal plants that can be linked to all subjects

Participant 1: So we are looking for a proper curriculum that can go right through that you can use at each grade on different subjects. I. wanna teach the small boys and create an apprentice with agricultural college. Everyone has a part to play and has a role. It's starting in school. I've traveled a lot around farms and seen that it's not sustainable. It depends on who is involved and who is in charge.

Participant 1: The problem is to develop food sources in urban areas because people are streaming into the cities and then they cant support themselves.

Participant 1: We need to grow in community gardens and everywhere, apartments, vertical gardening to take pressure off the agricultural system. We need to make everyone aware.

Participant 1: In the agricultural department the word organic doesn't appear, so I cant get anything done because the word, is not mentioned. So I can get fertilizer and pesticides but nothing organic.

Participant 1: They don't see the value in it, they want a quick fix.

Researcher: Ok, then the last thing...

Participant 1: Wait we first want to finish here... then you need seeds, you need workers, it's not easy to maintain this garden... I've left it for two weeks and you cant recognize this garden. We have a full time guy there, he's not properly full time, they pay for him and it's not enough. It's labor intensive and we've tried to make it less so, we've built tranches and wind breakers and you have to utilize your students because they are so good, they are so fast and enthusiastic and if you give them their own space that they have to weed and water it works.

Participant 1: You need at least one person with vegetable knowledge to know what to plant when and to prepare to know next month I must have this ready.

Participant 1: You should get a prefect system where you have a head gardener where the teacher only monitors then we don't have to come in every week. The kids can wash and prepare the vegetables and even bake their own bread. They can get sponsored into agricultural college.

What worked/what didn't work

Researcher: And this one is what makes a garden successful and what damages the garden

Researcher: We just came from a school that has a stoney area so they remove them and the more they remove the more they find, so we want to know, what was your challenges.

Participant 1: You've got to know your area, some places are sandy and others, like we had a lot of rocks and I just used them to make things, so sometimes if you take away the topsoil it can set you back because there's bacteria in it that you need.

Participant 1: And then you know you can plant in tire or terraces, you make your garden according to what you've got.

Researcher: So what would you say you need to be able to have a successful garden?

Participant 1: You need good quality soil if it's not good, bugs come in and there's decay. Your soil needs to be balanced and sometimes we go according to the textbook. There's certain times in the year where you have to do compost and mashing and there's so much I cant even explain. You need people to come into garden's and train. Xhosa's are not gardeners they are herdsman and it doesn't come naturally, of course they can be trained.

Participant 3: You need knowledgeable people to come in

Participant 1: They need to be trained and there are a lot of courses that are simple where you just need labor not heavy tools. Certain things grow and you must log this and hand this to the generations.

Participant 1: There's a school in Polokwane who does foundation farming and they are in Pretoria, I'll give you her details. All models are different but...

Participant 2: But they run it as a curriculum and one of their periods are when they go to the garden, it's very nice to see how a working model functions.

Participant 1 Every one is very busy and that's a challenge and it's about how much every person can help. On Saturday I really want to capture volunteers and if they can just give one hour a week it can help and then you really need to work on their conscious coz people don't want to help. We get the Americans in to help, they're amazing, they travel for a year and dedicate a year and just work and they love it and are full of it. We just look after ourselves in SA, the fittest survive here and that's a challenge. I cant get the support I need here. I'm looking for it.

Researcher: Are you associated with an NGO? I haven't got your details.

Participant 1: I was registered. I was approached by a company who wants to support me as a volunteer. I'm not sustainable because I'm a volunteer but I want to do this in more schools. There's a school down the road and for me... I'm busy setting up an NPO...it takes time. I'm trying to set up a pty to set up the NGO.

Researcher: And you Alison?

Participant 1: No we own an organization that support vulnerable children

Participant 1: There's so many orphans and most of them are aids related and there's a whole generation of children and older children who take care of them and as the country gets older the old Ubuntu mindset the community will support the children. That is dying with the goggos.

Participant 1: So we go into that and try and support the child and try and create a sustainability model in the community so that the community can better support their children and that's how we got involved in this stuff.

Researcher: Ok and how did you become involved in the school?

Participant 2: We've been working in this area and about...

Participant 1: I've been here a year

Participant 2: About two years we were looking for a place to put up a soup kitchen and then we met … and chatted to her and she gave us a vision and we tried to do that here.

Participant 2: So that's what we do here, we get sponsors for the learners, that helps with school clothes, transport and nutrition and this is part of the nutrition. I take kids to get them tested at the university to see where they are academically and then we know how to help them. We visit their homes and support the family and we also get involved in the school and we help to teach English and Maths. For us it's important to integrate the model so that it's sustainable so that we can move on to the next thing

Researcher: Yes that's exactly what we would like, a process where there's sustainability

Participant 1: And the only way you are going to get sustainability in our children is if you get them young. The damage are done... We now have 4 preschools where we sort out the nutrition and feed them. We need the stimulation, because once they are in Gr7, the damage is done... they cant read and write...

Participant 2: And also moral value with older kids it gets difficult, with the young kids, there's no guard, you can help them and they are friendly and in the garden it's also morals, values... there's also rules in the garden... you have to have respect, so it's not just gardening because...

Participant 1: They role models are mostly uneducated, they swear they drink and then they try these things at school and the teachers have this massive job of trying to discipline.

Participant 2: So if you can teach and keep them at school longer, like with homework clubs, it can help and then down the road down the school, I'm looking into that so you can cover their whole developmental phase. But you've got to catch them early so... I don't like to waste my time. If someone's not interested in my problem then I move on to someone who is interested and that's the reality in SA, it's harsh.

Researcher: I'm sorry if you already said this but how do you involve the children in the garden?

Participant 1: We are getting there, we are getting to a point where we try to make a proper curriculum to get the children into the garden at least one hour in the school day. Our only problem is transport. The taxi's come early and there's a big bus that takes all of them all at one.

Participant 2: You could get a lot done... the kids can play soccer

Participant 1: They get into the garden and they water the garden and they love it and they want to work

Principal: When we planned to start this we wanted to have separate stations for each grade to plant their own things

Participant 1: We can start that next week coz we just cleared down that old fence so we can make 5 stations

Principal: Coz I want them to be more involved

Participant 1: Yes but we need them to be involved more in the school day, coz we work with them in break time. When they see me they run, they really want to work. But when I wasn't here for two weeks you could see they weren't so interested so you really need to involve them.

Participant 1: We need the Department of Education to give us a teacher, we don't have enough teachers, last year we paid a teacher and she wasn't on the books. I mean … is the principal and she has to teach and she's the secretary, it could be so brilliant if we had enough teachers. One's life pays Charles. Everyone should do it. Instead of burning the tyres grow food in them. They stole the tyres for the toi-toi... we could teach the children here... we could give them a starter pack, here's your three tyres, your potting soil, your compost and here's your plants, I promise you...

Participant 2: motivate them through competition

Participant 1: You teach them here and then you give it to them to take home

Participant 1: Remember, that gardens don't cost money, you can make everything on your own, you can use drain water from the township, make your own seeds, you can trade seeds and food and that's important to remember.

Researcher: So you just need to know where to look for the things that you don't need to buy

Participants 1: Yes, I see Spar trucks with the peels of potatoes and I reroute them and people dump their cut grass, I don't understand that, that is like food for your plants

Researcher: Yes it is all about using your resources, the other school actually went to the place that sell fries and they use the potato peels in their garden. It's so beautiful

Participant 1: Yes, you can use everything, it's amazing, it's all recycling and about education. Everything is connected.

Researcher: So you said something about you use the produce from the garden, do you sell it?

Participant 1: You have to remember, to be sustainable you need three things, the first, you need community involvement. It's not ours, even though you use people from outside, they can do it themselves, they don't need us. They just need that support. That's very important, you are not going there to tell people what to do, they know best. We go and stand beside them. When you get the community involved, we like to split it into three. The first portion, is to feed the orphans and vulnerable people in the community and some of them are the students here, so firstly to feed the children. The second third is for the poorest people in the community. So if you want sustainability you need some sort of accountability, and how you get accountability is for instance to go to the head man or the elder of the village and say, you tell us who are the poorest people in the community who need vegetables and who need food, so that the mama who is working at the center knows that on Friday these people will come to the center to collect potatoes or whatever or carrots or something. It creates a level of accountability. So now you have two levels, you have the first level where you have the children who are there to eat and then the community who is expecting you to feed

them. If you don't have that, they will break it down and steal it. And then the third portion is for market exchange. It happens in various ways. I have cabbages, you are growing potatoes, give me some potatoes and I'll give you cabbages or you have a skill, come fix my pump and I'll give you some potatoes. And then thirdly, try and create an opportunity for them to gain market exchange for some cash. You need that for sustainability. Otherwise we have found the projects run for a while up and down and then eventually there is nothing left.

Principal: And then another way to support the community is to have a soup kitchen, where the mama's can make soup and people can queue up and get some soup

Participant 1: But now the school setup is different, the school setup is, to add to the nutrition value of the soup club and organic is the healthiest. We haven't gotten to the place where the children take vegetables home yet. … identified the poorest of the poor for us, and those are the kids we sponsor, about 22.

Participant 2: You can see those who are sponsored, they have confidence, always look Nice, they are friendly and polite.

Participant 2: There are kids who come and ask if they can be on the sponsorship list.

Researcher: Is your organization religious based

Participant 2: Yes we are linked to a church in the US and they have a church here.

Participant 2: The process works well, there are American families who sponsor children here and they are double supported. One for the transport because they live far away and the other the school uniforms and so. Now the sponsorship is not a big amount but if you think about it, they are mothers, single parents and all they live on is the grant of R350, I don't know how they buy everything. The transport is R200.

Participant 2: Some of the children didn't come to school and … gave us a list of children who couldn't afford to come to school so the first thing was to find them a sponsorship so they could come to school and that's where the second sponsorship came from. A big church in America has said that they want to adopt our school, which will bring more sponsorships for the kids so as we visit the homes we find more vulnerable children. So the best thing is if you have volunteers on the ground, which can help us.

Participant 2: It is in walking distance of the school and Chris, who is on the SGB suggested it coz our kids go into the high school into terrible conditions and violence so if we could send them there and observe all the primary they can share the facility and the garden and do what we do here there.

Participant 1: The Education department will give it to us.

Principal: I wrote a letter to the Department asking for help and they said no ask those rich neighbors

Participant 1: And now they come here and they take over. You want the Department to be involved. And it doesn't matter, as long as it gets done.

Participant 1: If someone just takes the first step, it's amazing what can happen, people just will get behind you.

Participant 1: …was here by herself in the dark and random people can just help and jump in.

Researcher: How many children are in this school

Participant 1: 224 from 28 learners in 2007. The Department wanted to close the school but the SGB said no. There's a church that operates here on weekends and it is functioning as its own little organization.

Participant 1: What happened to the garden?

Principal: No they are still busy, we had to send in photos about our garden and then they came here to see if it was true

Participant 1: Are we gonna win

Principal: yes

Participant 1: We want to use the money to build a place where the children can eat and go together, especially when it rains.

Researcher: how many classes

Participant 1: From Grade R to grade 7, so 8.

Participant 1: We've got lots of support, but we need the government to supply more teachers so that volunteers can just add that extra support. I bring my 2 laptops and work with the support kids, coz we had a break in and all the laptops were stolen. And we had people coming in to make this place nice, the Jewish women's organisation and the Freedom walkers.

Researcher: Thank you guys it was very valuable

Participant 1: I hope so, can we take you for a walk?

Researcher: Yes please.

SCHOOL 5

Ingredients of a successful garden:

Participant 1: first of all if you want to start a garden, you need soil, manure or fertilizer, tools, so that you can make your garden nice and clean, water, it depends when... Sometimes the taps... Sometimes the water don't come out, you need the Jojo tanks, so that you can keep your water, so that when you want to water the garden...so you can go to the tank and pour it. And...hosepipe and a watering and the seeds, weed eater , manpower and the tractor for those gardens that are big and safety shoes so that when its... Ja... Straw hats, for when it's hot and then the hand gloves.... yes...

Researcher: do you have those, shoes and hats and gloves?

Participant: 1 no

Researcher: so what do you use now?

Participant 1: we use our shoes

Researcher: ok

Participant 2: but it will be ideal for them to have that

Researcher: ok, and… Where do you get the seeds that you use for the planting

Participant 2: we got from agriculture

Researcher: ok and do you sometimes try and keep your own seeds from the plants?

Participant 1: yes

Researcher: you try and do that... Ok, and the tools like the hosepipe and the watering can and so, do you have that?

Participant 1: we have the spades, and garden fork and the hose and krywa, wheelbarrow

Researcher: and where did you get that?

Participant 1: agriculture

Researcher: department of agriculture?

Participant 1: yes

Researcher: did you ask them or did they come and give you?

Participant 1: they give us

Researcher: so they know that Walmer primary has a vegetable garden and they come and give to you.

Participant 2: yes

Researcher: and do you have a tank?

Participant 2: no

Researcher: not yet, but you want one

Participant 2: we want one

Researcher: ok and who works in the garden? Is it teachers or volunteers?

Participants 1: volunteers all volunteers, free. For free...

Researcher: and how did you start in the garden, did someone ask you or did you as?

Participant 1: yes we got our coordinator, she's not here now, she just start, eh, like.... our government said, people must do things with their own hands so the garden was the... Key thing for people to have something to eat, so there are people who are working in certain areas like in Walmer, like this coordinator they are talking about, she is the one who brought the idea, how about starting a garden. Then they were willing and they started the garden from the department of agriculture, whenever they are short of seeds, they approach her and then she goes to the department and ask for them things they are shorting.

Participant 2: sometimes take a long time.... Take long time...buy myself...sometimes they take out money from their pocket, coz they are passionate about that. Everybody has garden in the location. Schools are the ones who have a big ground...ja, otherwise they would like to do this in their houses at home but there is not enough space

Researcher: yes

Researcher: this coordinator, is she associated with the department of agriculture, or is she a volunteer?

Participant 1: she's a volunteer

Researcher: From the community?

Participants 1: from the community

Participant 2: and also they do the small gardens at our location.

Researcher: and does she only coordinate for this school or other schools also?

Participant 1: those three schools, Walmer primary, Walmer high and clinic

Researcher: ok

Researcher: and that coordinator helps with all three gardens?

Participant1 1: yes

Researcher: and do the learners, children help in the garden sometimes?

Participant 1: no

Researcher: so they never go there, the children?

Participant 1: no

Researcher: what do you do with the vegetables?

Participant 1 : we sell it, sometimes when we see we've got many problems in our location, sometimes you see the sick people and then we give to them and then old age also...something to eat and soup kitchen.

Researcher: ok, for the volunteers do you get any stipends from the department of public works?

Researcher: no nothing

Researcher: ok, thank you very much.

What worked/what didn't work

Participant 2: ok talking about a beautiful garden, we need good soil, maintenance, fencing, compost, water, nice weather, because when weather is not right it can damage the garden. You must love the garden. If you don't love your garden is nothing is gonna go right. We are going to the ugly garden. The heavy rains and snails that are going to eat your garden. Not enough water. Weeds and non-maintenance, because you must prepare your garden, not just leave it. I think we are finished.

Researcher: what do you do to try and fight the worms and the snails?

Participant 2: we bought the... We buy it from the shop. We buy something from shop and then we put it on, for different goggos, one for the snails, and one for the worms. They have forgotten the names now. (Wants to show us)

Researcher: and how do you know that works? How did you know to put that?

Participant 2: when they go to the shop, they say that this is their problem and they advise them.

Researcher: and where do you get the money to buy that?

Participant 2: our selves and the department of agriculture, they advise us, you must make a row onions and then the other plant and then another plant and then onion and then another plant so that that smell of the onion can kill them.

APPENDIX D

CODING OF PHOTOGRAPHS OF VISUAL POSTERS

See chapter 4 for detailed themes, sub-themes and coding

School 1:

PRA-based workshop activity 1: Ingredients of a successful garden

Group 1

Building a garden

Manure

Garden tools (watering can, fork, rake)

Fence

Seeds/seedlings

Man power (learners)

Soil

Water/tank

Leaves

Newspapers

Gloves

Overalls

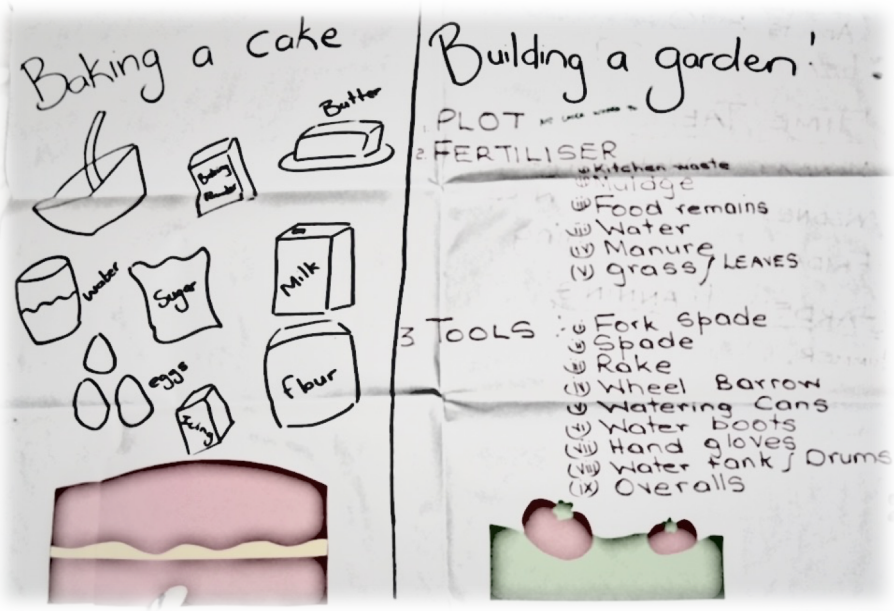
Pesticides (organic)

School 1:

PRA-based workshop activity 1: Ingredients of a successful garden

Group 2

1. Plot
2. Fertiliser
    - i. Kitchen waste
    - ii. Mulch
    - iii. Food remains
    - iv. Water
    - v. Manure
    - vi. Grass/leaves
3. Tools
    - i. Fork Spade
    - ii. Spade
    - iii. Rake
    - iv. Wheel barrow
    - v. Watering cans
    - vi. Water boots
    - vii. Hand gloves
    - viii. Water tank/drums
    - ix. Overalls



School 1:

PRA-based workshop activity 1: Ingredients of a successful garden

Group 3

Plot

Soil

Fence

Tools (Spade, fork, rake, watering can)

Manure

Water

Chicken manure

Waste from vegetables when you peel them

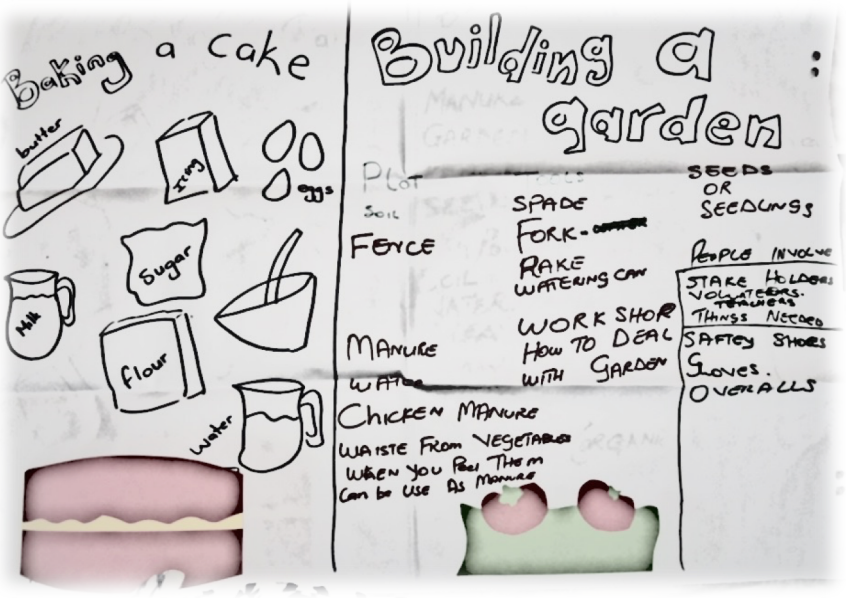
Can be used as manure

Workshop on how to deal with garden

Seeds or seedlings

People involved (Stakeholders, volunteers, teacher)

Things needed (Safety shoes, gloves, overalls)



School 2:

PRA-based workshop activity 1: Ingredients of a successful garden

Manure

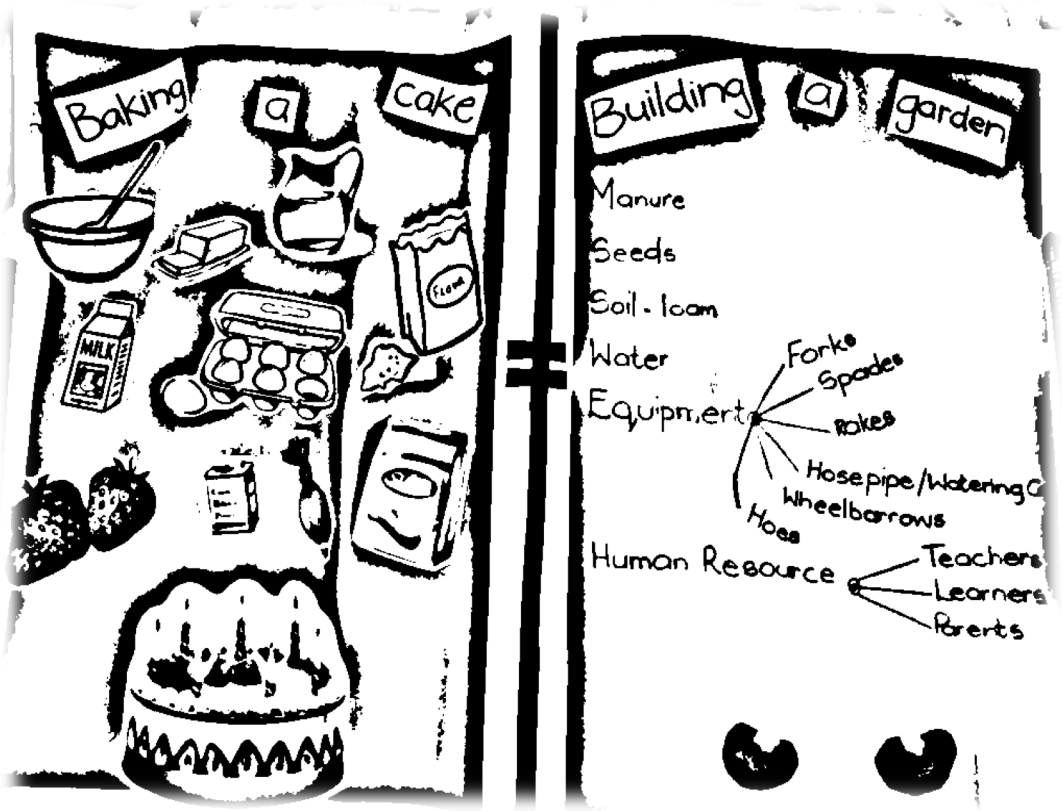
Seeds

Soil – loom

Water

Equipment (Forks, spades, rakes, hose pipe/watering can, wheelbarrow, hoses)

Human resource (Teachers, learners, parents)



School 3:

PRA-based workshop activity 1: Ingredients of a successful garden

Group 1

Manpower (Parents, Learners, Teacher)

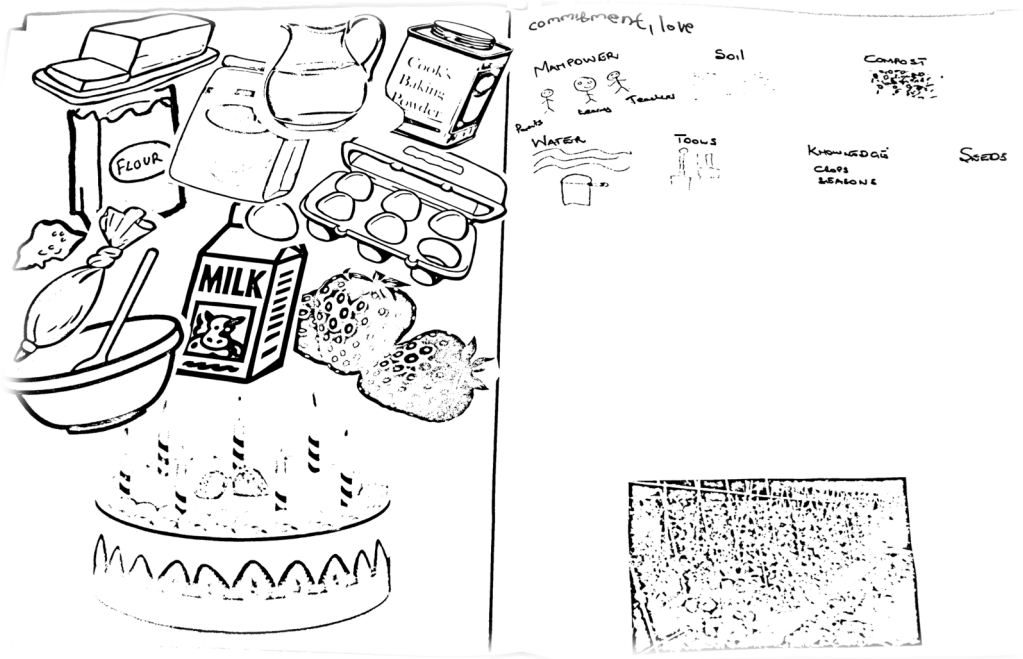
Water

Tools

Soil

Compost

Knowledge (Crops, seasons)



School 3:

PRA-based workshop activity 1: Ingredients of a successful garden

Group 2

Passion

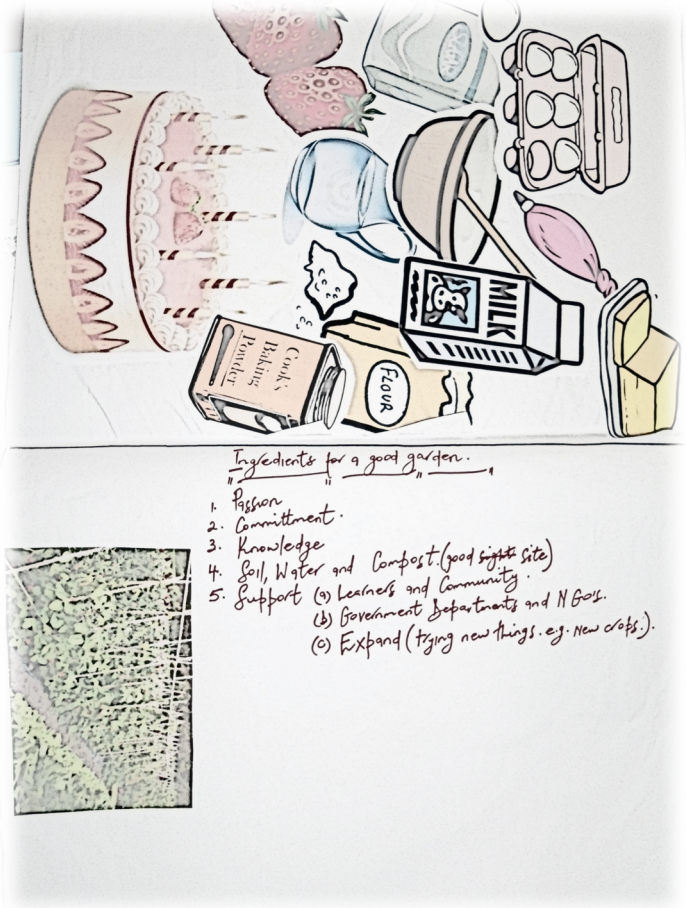
Commitment

Knowledge

Soil, water and compost (good site)

Support:

- Learners and community members
- Government Departments and NGOs
- Expand (trying new things eg. New crops)



School 4:

PRA-based workshop activity 1: Ingredients of a successful garden

Space open

Water source (Hosepipe and parcel storage)

Security

Healthy soil (Worm farm, compost, test soil)

Wind protection

Pest control

Tools (6 of everything)

Seeds

Labour intensive

Safety equipment

Equip garden with fun!

Study material to educate

Permaculture growing methods

School 5:

PRA-based workshop activity 1: Ingredients of a successful garden

Soil

Manure/fertilizer

Tools

Water eg. Jojo tanks

Hose pipe

Watering can

Seeds

Weat eater (round up)

Man power

Tractors for big gardens

Safety shoes

Straw hats

Hand gloves

Fence

School 1:

PRA-Based workshop activity 2: What works and what doesn't work

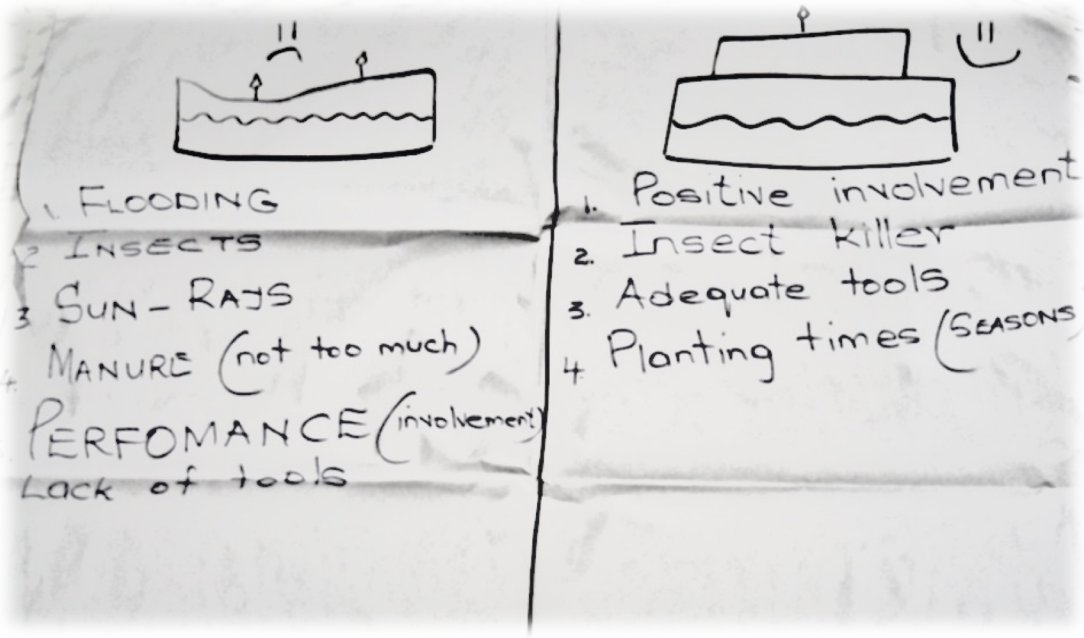
Group 1

What doesn't work

- Flooding
- Insects
- Sun-rays
- Manure (not too much)
- Performance (involvement)
- Lack of tools

What works

- Positive involvement
- Insect killer
- Adequate tools
- Planting times (Seasons)



School 1:

PRA-Based workshop activity 2: What works and what doesn't work

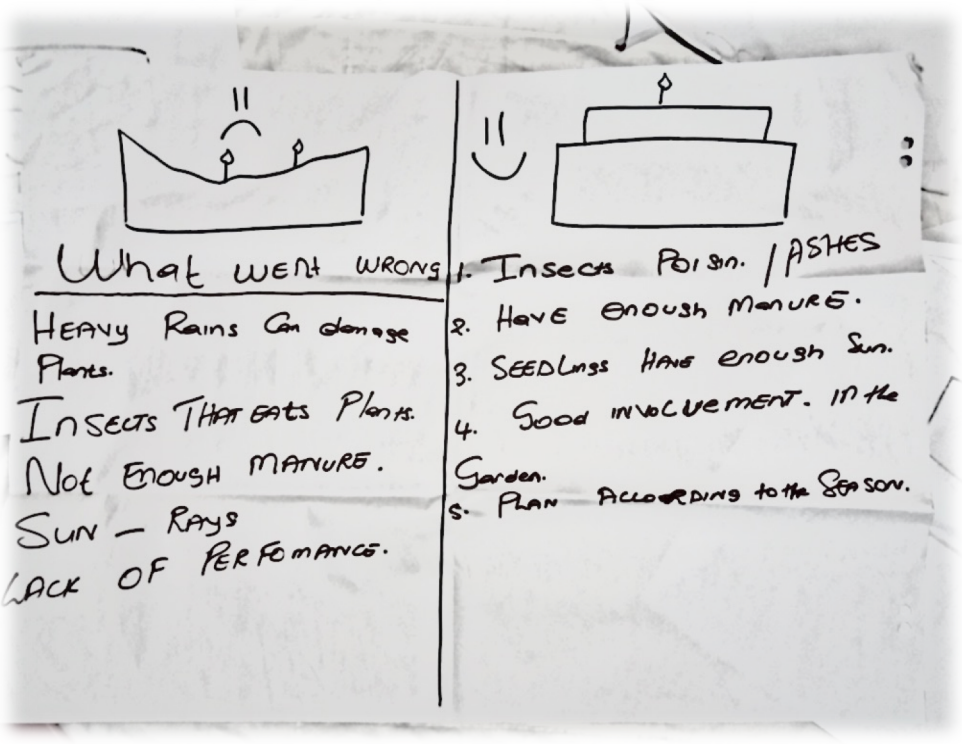
Group 2

What doesn't work

- Heavy rains can damage plants
- Insects that eats plants
- Not enough manure
- Sun-rays
- Lack of performance

What works

- Insect poison / ashes
- Have enough manure
- Seedlings have enough sun
- Good involvement in the garden
- Plan according to the season



School 1:

PRA-Based workshop activity 2: What works and what doesn't work

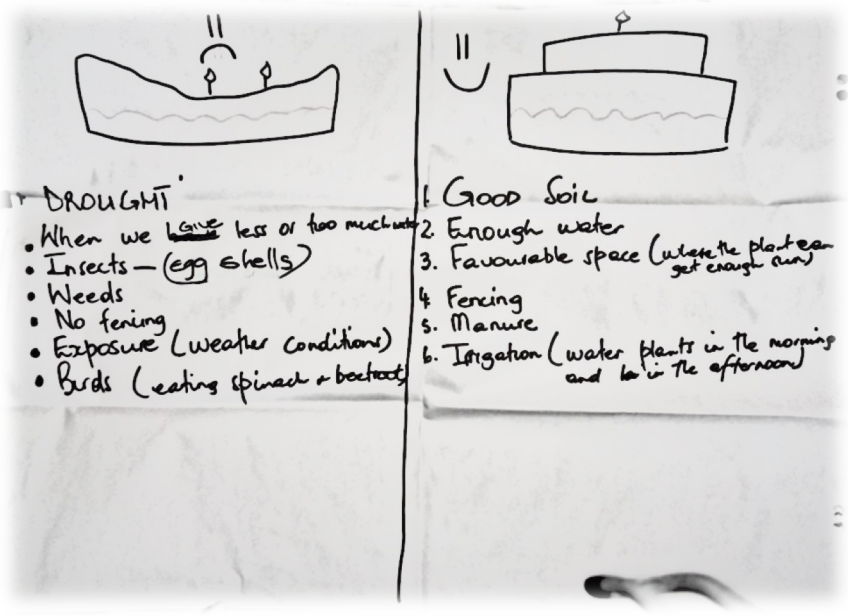
Group 3

What doesn't work

- Drought
- When we give less or too much water
- Insect (eggshells)
- Weeds
- No fencing
- Exposure (weather conditions)
- Birds (eating spinach and beetroot)

What works

- Good soil
- Enough water
- Favourable space (Where the plant can get enough sun)
- Fencing
- Manure
- Irrigation (Water plants in the morning and in the afternoon)



School 2:

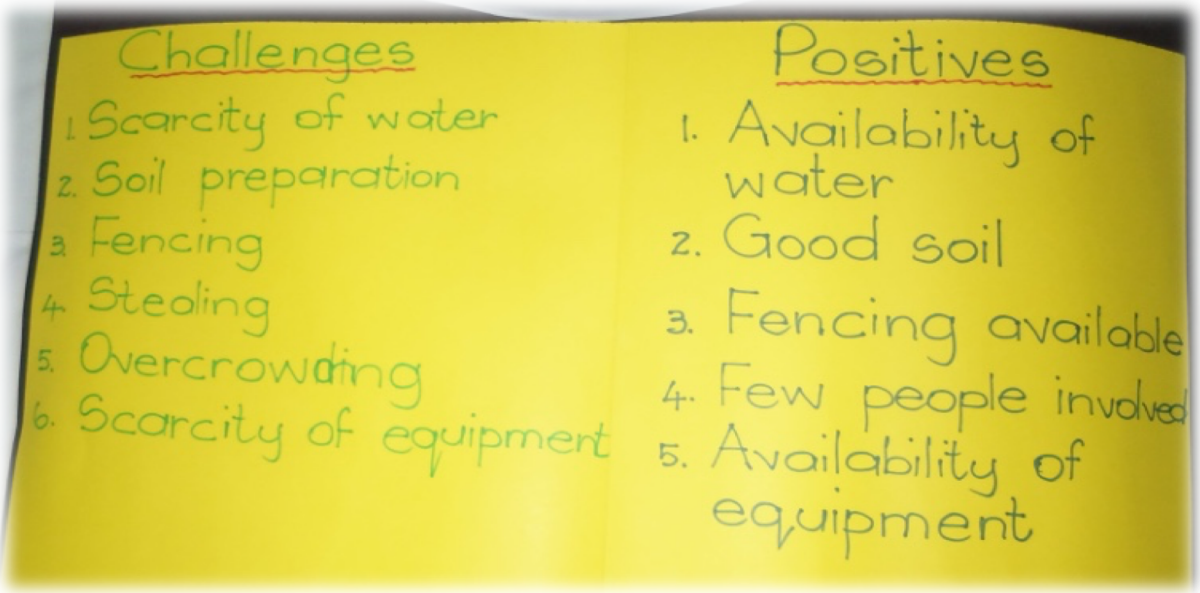
PRA-Based workshop activity 2: What works and what doesn't work

What doesn't work

- Scarcity of water
- Soil preparation
- Fencing
- Stealing
- Overcrowding
- Scarcity of equipment

What works

- Availability of water
- Good soil
- Fencing available
- Few people involved
- Availability of equipment



School 3:

PRA-Based workshop activity 2: What works and what doesn't work

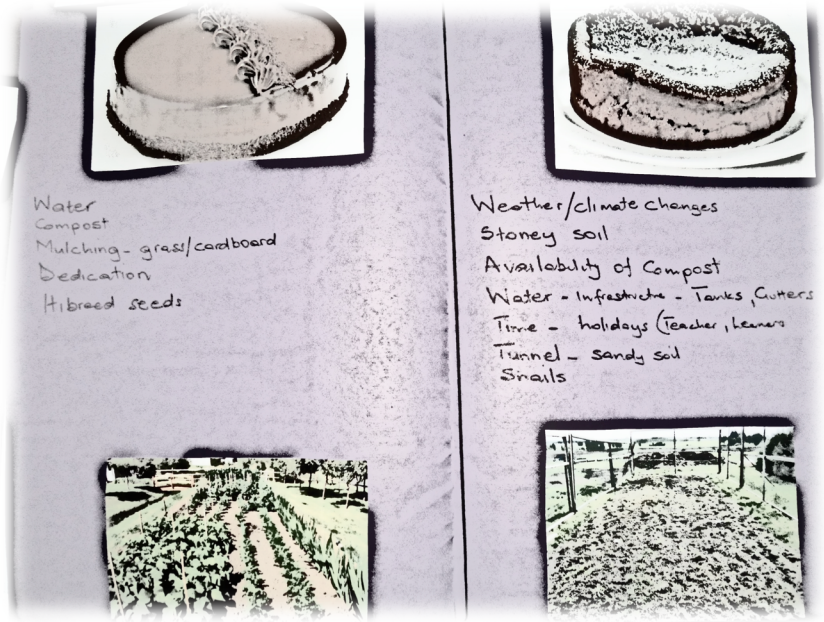
Group 1

What doesn't work

- Weather/climate changes
- Stoney soil
- Availability of compost
- Water (Infrastructure, tanks, gutters)
- Time (holidays (Teacher, learners)
- Tunnel (Sandy soil)
- Snails

What works

- Water
- Compost
- Mulching (graas/ cardboard)
- Dedication
- Hybrid seeds



School 3:

PRA-Based workshop activity 2: What works and what doesn't work

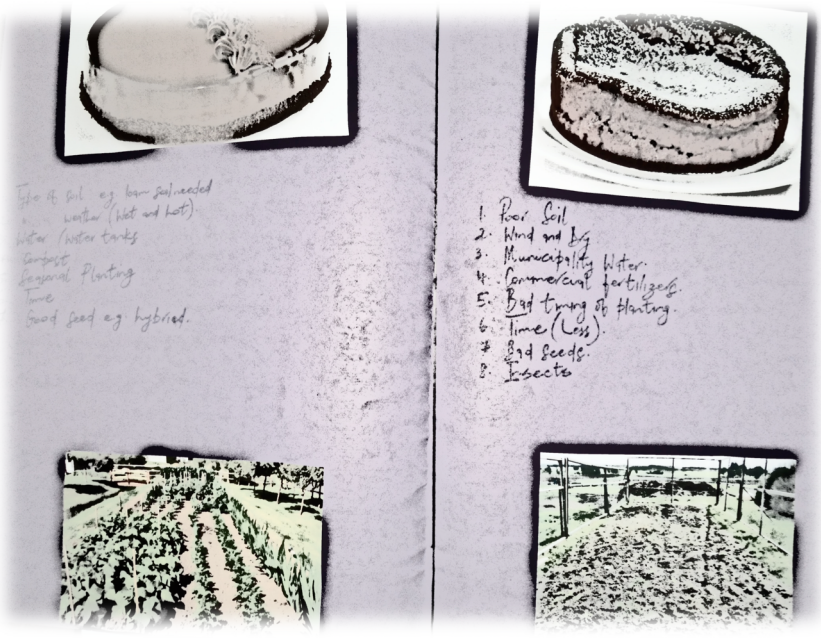
Group 2

What doesn't work

- Type of soil e.g. Loom soil needed
- Weather (Wet and hot)
- Water (Water tanks)
- Compost
- Seasonal planting
- Time
- Good seed eg. hybrid

What works

- Poor soil
- Wind and dry
- Municipality water
- Commercial fertilizer
- Bad things of planting
- Time (less)
- Bad sseds
- Insects



School 4:

PRA-Based workshop activity 2: What works and what doesn't work

What doesn't work

- Poor drainage
- Poor soil quality
- Poor management
- Lack of education
- Poor planning

What works

- Healthy soil
- Natural pesticide and compost
- Mulshing
- Good irrigation to resource water wate
- Recycling and planning
- Crop rotation
- Companion planting
- Good gardening principles
- Education
- Sustainable Methods
- God

School 5:

PRA-Based workshop activity 2: What works and what doesn't work

What doesn't work

- Heavy rains
- Worms and snails
- Not hacing enough water
- Weeds
- Non maintanance

What works

- Good soil (maintanace) fencing
- Compost
- Water
- Nice weather
- Love your garden

School 1:

PRA-Based workshop activity 3: Seasons

Teacher group

Summer:

Spinach

Greenbeans Peppers

Tomatoes

Carrots

Challenges:

Sun

Water

Activities:

Watering tanks

Mulching

Weeding

Rewards:

Selling for the community or parents

Empowering the members

Autumn:

Spinach

Beetroot

Potatoes

Onion

Turnip

Challenges:

Drought

Activities

Watering

Mulching

Spring:

Mielies/maize

Spring onion

Avocados

Challenges:

Seasons are different

Birds damage the crops

Winter: (challenging season)

Challenges:

Windy

School 1:

PRA-Based workshop activity 3: Seasons

Volunteer group

Summer:

Spinach

Peppers

Cauliflower

Challenges:

Sun

Water

Activities:

Prepare soil

Summer plant

Ask one of learners to water

Rewards:

Selling to the community

Cooking for disadvantaged learners

Spring

Maize

Tomatoes (small)

Spinach

Autumn:

Potatoes

Spinach

Carrots

Lettuce

Peppers

Challenges:

Insects

Winter

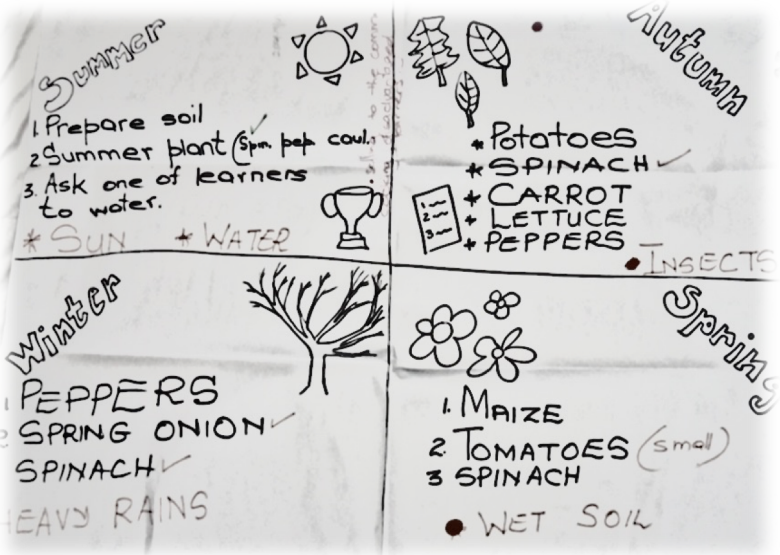
Peppers

Spring onion

Spinach

Challenges:

Heavy rains



School 3

Group 1

PRA-Based workshop activity 3: Seasons

Summer:

Sunflower

Peppers

Sweet potato

Brinjal

Tomatoes

Chillies

Turnip

Winter:

Cabage

Spinach

Brocolli

Cauliflower

Peas

Broad-bean

Harvest:

Celery

Parsley

Corionader

Mint

Bay leaves

Citrus fruit

Autumn:

Carrot

Onion

Beetroot

Spinach

Harvest:

Maize

Sweet potatoes

Grandilla

Spring:

Maize

Pumpkins

Beans

Potatoes

Carrot

Melons

Harvest:

Strawberry

Borage

Comfry

School 3

Group 1

PRA-Based workshop activity 3: Seasons

Winter:

Peas

Chillies

Broadbeans

Strawberries

Turnip

Mint

Coriander

Chamomile

Spring:

Carrots

Onion

Spinach

Sweet potato

Maize

Sugar beans

Watermelon

Summer:

Sweet potatoe

Onion

Pumpkin

Strawberries

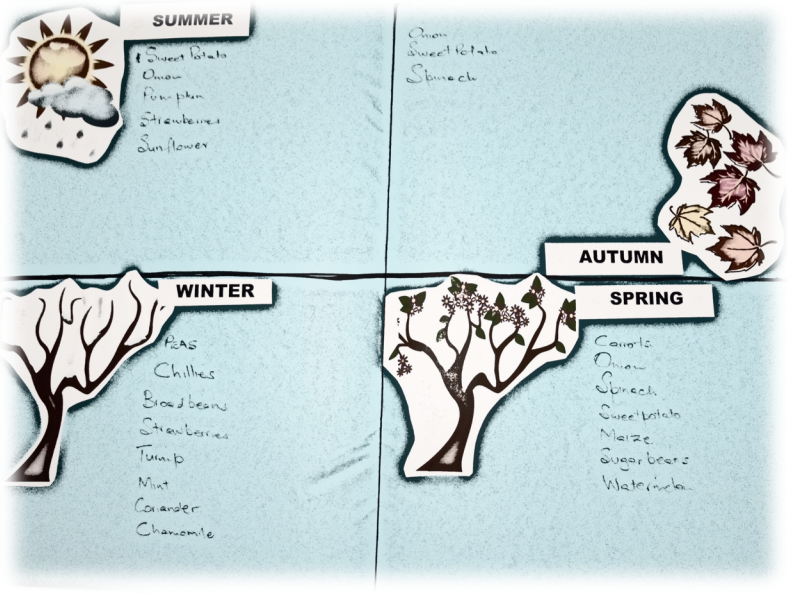
Sunflower

Autumn:

Onion

Sweet potato

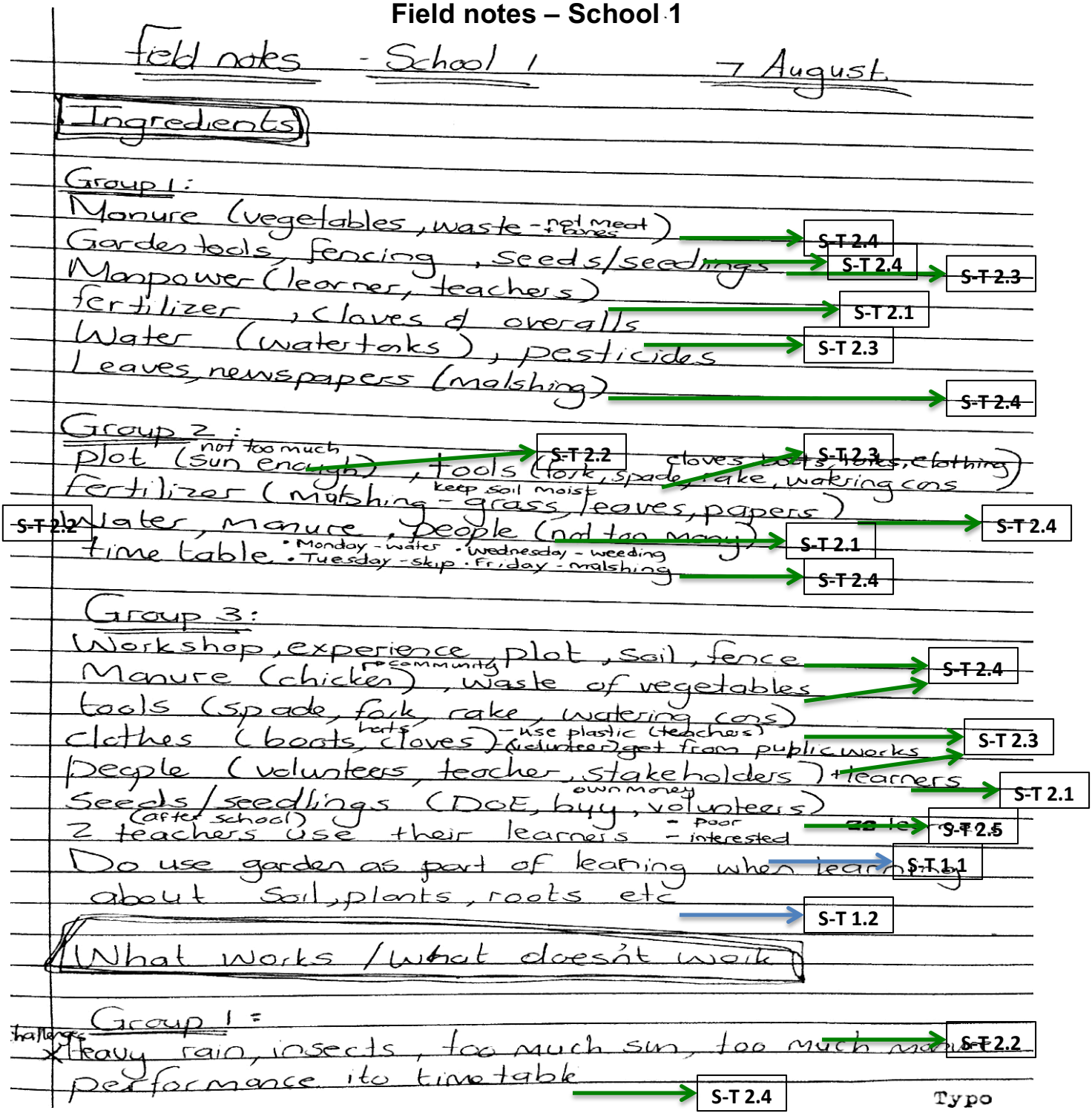
Spinach



APPENDIX E

CODING OF FIELD NOTES

Field notes – School 1



Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring

Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring

Field notes – School 2

S-T 2.4

School 2 fieldnotes 7 August

Ingredients

Manure (vegetable wastes - prepare soil, grass)
seeds (sponsor, buy, municipality).
Soil - good soil → S-T 2.2
Water (tank), taps
Equipment (forks, spades, rakes, hosepipes, watering cans wheelbarrows) → S-T 2.3
People (teachers, parents, learners) → S-T 2.1
parents brought tools (take home) otherwise theft
challenge: equipment → S-T 2.3
didnt work when learners were involved
Part as lessons - difficult - time → S-T 1.1
produce - sold, given to parents, sick children, parents had own plots, orphins, HIV Aids patients → S-T 1.2 → S-T 1.1
new seeds, soup kitchen

What worked / what didnt work

Challenges:
- Scarcity of water → S-T 2.2
- preparation of soil → S-T 2.1
- Parents reluctant to plant after harvest
- fencing (people, animals) → S-T 2.5
- Neighbors steal from eachother → S-T 2.3
- Scarcity of equipment → S-T 2.1
- overcrowding

Need:
- Water → S-T 2.2
- Good soil
- Manure
- fencing → S-T 2.5
- Less people involved
- equipment available → S-T 2.3

-everyone should take responsible

Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring

Field notes – School 3

Fieldnotes School 3 1 October

Ingredients

Group 1

- Manpower (parents learners, teachers) → S-T 2.1
- Soil
- Compost + Manure
- water → S-T 2.2
- watering can + tools → S-T 2,3
- knowledge → S-T 2.4
- What to plant when
- Seeds/seedlings

Get Seeds - rural dev, Municipality, food + trees
background - indigenous knowledge → S-T 2.4
Intercropping (plant certain things together → S-T 2.5
Becoming more popular to have garden (used to think you are backwords "farmgirl in township" → S-T 1.2

Group 2

- Passion → S-T 2.1
- commitment
- knowledge (from everywhere) → S-T 2.4
- Soil
- water → S-T 2.2
- Compost
- Site (not too much shade) → S-T 2.2
- holiday-help → S-T 2.1
- Support (learners/community
  ↳ dep of edu, rural dev, correctional services
  - NGO's → S-T 2.5
  - expansion - grow different things → S-T 2.5

What works / what doesn't

Group 1

✓ + dedication → S-T 2.1
+ water → S-T 2.2
- Compost
- Mulching (newspapers, grass, cardboard) - intercropping → S-T 2.5
- seeds & seedlings (hybrids)
+ weather
- wind breakers → S-T 2.2
x - Rain = water
- Stone → S-T 2.2
- No compost - tunnel → S-T 2.3

Group 2

✓ Soil x time
Seasonal planting x wind → S-T 2.2
Water → S-T 2.2 x compost
- fertiliser → S-T 2.5 x bad seeds
x worms/birds → S-T 2.1
KNOW when to plant what → S-T 2.5

Typo

Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring

Seasons

Group 1 | Group 2

Sping
plant
grow carrots, onion, spinach, sweet potato,
Sugar beans, watermelon; Maize, banana
Sweet potato good for soil
Summer - harves
Autumn:
onion, Sweet potato
Spinach
Winter : harvest
Chillies, broadbeans, turnip, mint
coriander + camomile

Manure + mulshing help → S-T 2.4
that you can plant → S-T 2.5
all year round
look what each season
looks like

* send learners to garden in free period
* 3 volunteers - teachers + learners → S-T 1.2
- Small children collect snails
- Get support
- Work with environmental calender → S-T 2.5
host events to get donations

Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring

Field notes – School 4

Field notes   School 4   1 October

Ingredients

~~Sun~~
Space (sun/shade)
Water source → S-T 2.2
Security fence
Good soil
Compost, malsh, irrigation, minerals, soil textures
test soil
Shelter from wind → S-T 2.2
Gardening tools → S-T 2.3
Gutters
tanks → S-T 2.3
Curriculum
Seeds
Workers (use learners
Wind breakers

What works / what doesnt

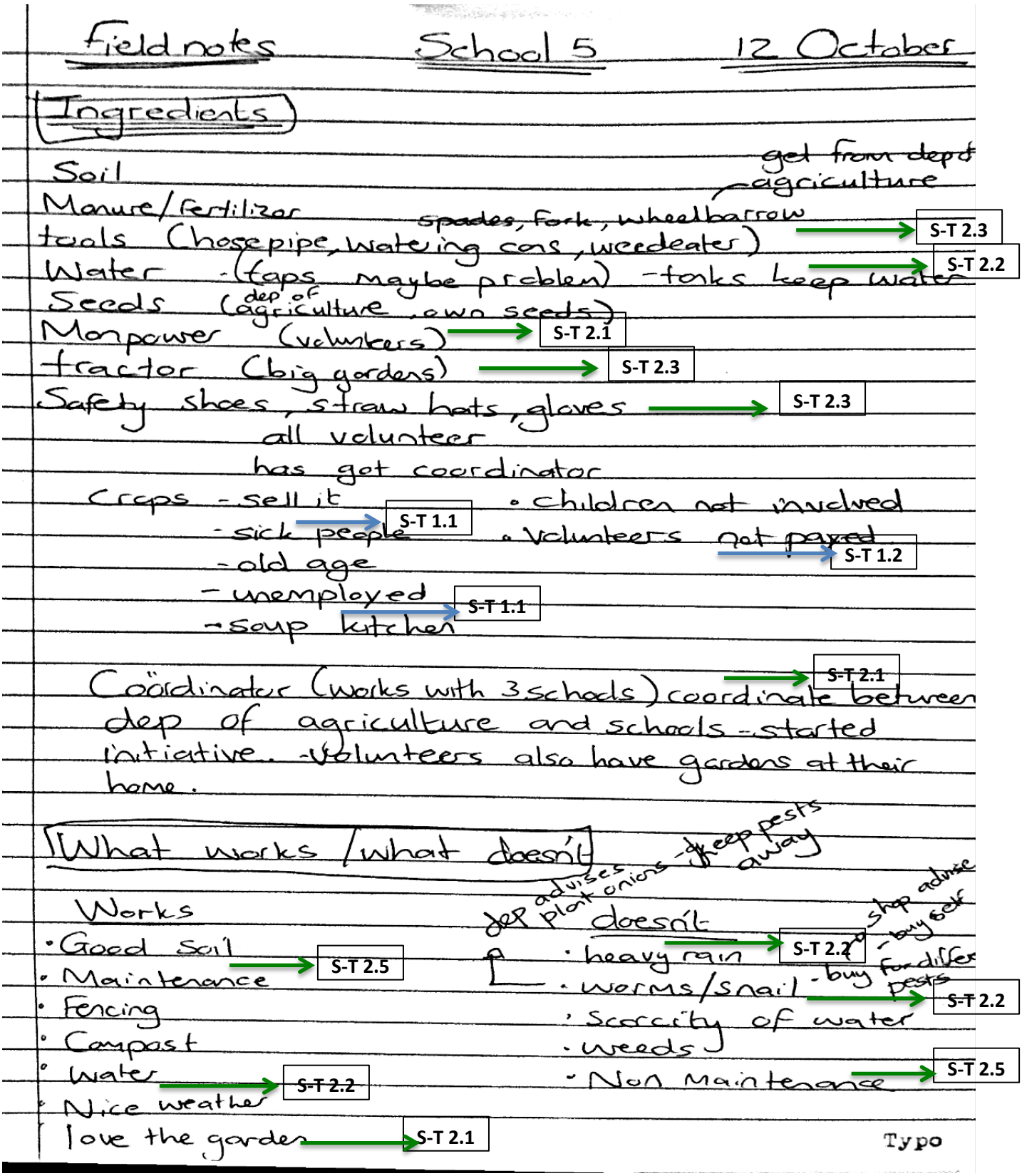
What works	what doesnt
- good soil (balanced → S-T 2.2	- Little time
- compost / Malshing	
- expert volunteers	
- know your terran	
- See opportunities - Reroute sport trucks	
- Recycling	

Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring



Theme 1:
Value of school-based vegetable gardens

Sub-theme 1.1: Providing food and nutrition
Sub-theme 1.2: Skills acquisition
Sub-theme 1.3: Practical application of the curriculum

Theme 2:
Sustaining school-based vegetable gardens

Sub-theme 2.1: Mobilising human resources
Sub-theme 2.2: Attending to environmental conditions
Sub-theme 2.3: Establishing the required infrastructure
Sub-theme 2.4: Accessing and enhancing knowledge
Sub-theme 2.5: Continued planning and monitoring

APPENDIX F

CODING OF RESEARCH DIARY

Research diary - School 1 **7 August 2015**

When entering the school we were greeted by the coordinator who told us where the participants were waiting. There was a large group who I later realized were made up of teachers and volunteers. When the participants spoke one could clearly notice that there was a distinction between the public worker volunteers and the teachers involved in the garden. The two groups functioned independently of each other and this could be seen in how they spoke about the volunteers having a timetable and getting hats, boots and clothing from the department of public works, but the teachers not having any of this... The groups discussed the posters for a long time before writing and the overall impression was that the participants were very knowledgeable. It seemed that the volunteers were more knowledgeable about the practical requirements and that they were involved more so than the teachers on a daily basis. When asked on student involvement the teachers seemed less confident regarding how much the learners were involved. They did indicate that some learners were involved based on criteria they used to select them. The learners seemed only to be involved in the teachers part of the garden, having nothing to do with the volunteers. The garden did not seem very organized and one clearly saw designated plots where each group was responsible for their own sections. Even though the group was a large group of participants. I did not pick up a passion for gardening and no real dependence on the success of the garden. I got the impression that the school had a passionate hardworking principal who was good at organizing and networking and that the garden was the result of her dedication to bettering her school. It seems like the school had a lot going on and that the teachers were spread very thinly. A positive thing from this school was that they gave some of the produce to the learners to take home to their families. In a way some of the participants seemed to see this as a way of taking care of those in need in their community

---

Research diary - School 2 **7 August 2015**

There were only a few participants today. They were very sociable and excited about our presence. It seemed like they had the basic knowledge of what is required for the establishment and upkeep of a garden but what was also lacking was an excitement and passion regarding the value of the garden. They exclaimed remorse over the failure of their garden. There did not seem to be one coordinator in charge of this school. It appeared as if it was mainly the parents who were involved in and in charge of this garden that the school used to have and they emphasized that overcrowding was a problem as the parents stole each other's things and interfered in each other's space which caused difficulties. My feeling is that this garden was not sustainable because the parents alone were the key role players and I feel that there was perhaps a lack of planning and blame shifting that was taking place. Comments like "the parents were lazy to start again" gave me that idea. The garden seems to have functioned as a source of nutrition for vulnerable community members. The garden was not used for educational purposes and the learners were not utilized as role players. The garden

was used as a tool for punishment which in my opinion has a very negative impact on the children as one wants to inspire them with this skill that they may transfer to the community.

Research diary - School 3 **1 October 2015**

When walking in we were greeted by a smiling face who was extremely happy that we were there. The school had a normal flower garden at the office which the participants pointed out with pride. This showed an interest in gardening beyond only vegetables... An interest in beautifying their school. The participants entered one by one and took their place. Some participants did not understand English and the confidentiality part and informed consent had to be translated by another teacher. What was apparent was that the participants took their time in thinking about each question and they spoke a long time amongst themselves before writing anything on the posters. The participants were clearly knowledgeable and the one participant was clearly taking a leading role in the garden. Her passion and dedication for the garden was very clear. With the first activity, ingredients of a sustainable vegetable garden, the participants mentioned all the obvious basic necessities but also that a main ingredient was passion and dedication and that one needs to be adaptable to deal with whatever challenges arise. The knowledge shared on what works and what doesn't work was obviously from their own experience as the participants spoke with confidence, sharing stories about what went wrong in the past and what worked. Before the last activity on the seasons was presented, the participants already mentioned how each season differs. The participants appeared to be a tight knit group who got along well. They seemed to respect each other and the principal and the coordinator. The coordinator and principal in return showed great appreciation for all the other participants even when these credited the success to them. It was clear that the school and teachers were the driving force behind the garden and that even though they made use of external resources, they did not depend on these. What stood out was how proud each participants were of the school garden and they were eager to show us their crops and brag about how many of what vegetable they have grown. The teachers treated the volunteers from the community, two elderly men with a lot of respect and showed appreciation for their hard work. I think that this model is sustainable as the teachers and volunteers are the driving force behind the garden. The garden was a big plot with some noticeable structure to where what was planted. The produce looked dry but still under the circumstance well kept after. We walked past two learners who were carrying a big bin of potato peels which came from the kitchen. This they carried to the garden to be used as compost and mulching. The coordinator picked up some of the vegetables to give to us and show us. A clear spirit of sharing as she also gave some to a teacher standing close by. The participants spoke out from their view point of knowing how some schools only want to get donations without the commitment or using what they have.

Research diary - School 4 **1 October 2015**

The participants from school 4 were mostly made up of volunteers. These volunteers were not part of the community that the children and teachers belong to but were from NPO's and from the city who decided to become involved to support the school. Some of the participants appeared confused regarding the reason for our visit and drew a skewed conclusion of what we were there to do. The discussion on both topics, the ingredients and what worked and what didn't posters were mainly dominated by the external volunteers. One participant mentioned that she was the driving force behind the garden and its success and that if she was not there the garden would fail and that in her absence the garden the deteriorated. Another participant, a teacher disagreed with her. The external volunteer participant mentioned that the learners could not be in the garden unsupervised and that the learners do not really do any work in the garden on their own. Again to this statement the teacher participant objected and spoke about how the learners have their own piece of the garden that they take care of. This seemed to appear as a surprise to the external volunteer participant. The principal did not speak much during the discussion, but mentioned how great full she was for the external volunteer's contribution as the school were threatened to close down before they came. The principal also mentioned to the external volunteer participant that she would like the different classes to have their own piece of the garden that they were responsible for. This volunteer said was in the planning to be started shortly. If I had to interpret what I witnessed at this school I would say that it seems that the school and teachers are just observers and visitors to the garden and they are not key role players. This garden without the volunteers will probably not continue as the school does not take ownership of it. They are greatful for the garden but not dependent on it and they seem less excited about it in comparison to other schools. This garden seems to be a showcase garden for public viewing. The external volunteers seem to put a great emphasis on wanting to incorporate the garden in the learners learning and in the curriculum. The teacher and principal did not say much on this subject and did not seem that excited about it as the volunteers. I do not think that this is a sustainable model and this is not the type of model one would want to duplicate in other schools. I cannot see this model working as the school and teachers are not active role players who take ownership. I did gather valuable knowledge from this school on additional resources such as the need to test soil and other practices that can be implemented to take a garden to a higher level to produce better crops and to enhance soil quality and so on. This data is valuable and I do think that there is a place for external volunteers with experience and expert knowledge who can advise and support but not initiate and drive.

Research diary - School 5 **12 October 2015**

We started our visit with going to see the garden. Firstly we passed a section which the participants indicated as belonging to a parent from the community. The last plot we visited were the one the school maintained. It was a small plots and there were

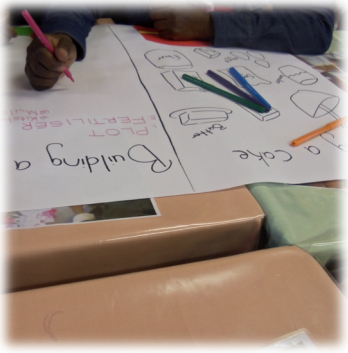
cabbage, butternut, beetroot and onions growing there. The space around the garden was untidy, the grass was uncut, there was litter and the garbage pile was directly next to the garden. The soil was of very poor quality. It was basically sand, like one would find on the beach. The participants mentioned that they put cow dung in the sand as compost, but there was no indication of this. There were pieces of garbage amongst the vegetables in the sand and the crops looked wilted and small. The garden was surrounded by a fence. The participants could mainly not speak English. One got the idea that none of them were there for the benefit of the school, but rather for their own sakes as a way of generating income for themselves. They also indicated that they did not get paid for their involvement and that they often buy things for the garden out of their own pockets. They mentioned that there was no learner involvement in the garden and that the garden was not used as part of the curriculum. This garden was purely started as an initiative for struggling community members to utilize the open space of the school to plant food for themselves and generate income. It was not really an initiative for the benefit of the school or learners but for the parents and community. My feeling is that this garden will be sustainable as long as the parents can attain value from it. It will be sustainable as long as the parents need food and income.

APPENDIX G

PHOTOGRAPHS AND FIELD VISISTS

School 1



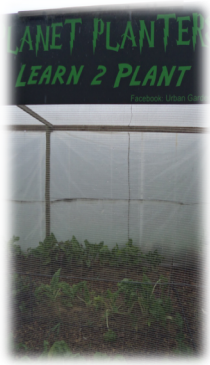





School 2

School 3

School 4



School 5

APPENDIX H

INTERVIEW SCHEDULE

1. What were the conditions around the commencement of the school-based vegetable garden?
2. What, in your opinion are the ingredients to a sustainable school-based vegetable garden?
3. What is done with the produce of the school-based vegetable garden?
4. Where did you get equipment to work in your school-based vegetable garden?
5. What were some of the good and bad times that your garden experienced?
6. What challenges would you say impact on the sustainability of a school-based vegetable garden?
7. Who are the people involved in your school-based vegetable garden?
8. Do learners play a role in the school-based vegetable garden?
9. Is the garden integrated into the curriculum and used in some school subjects?
10. Is there someone who takes responsibility for the school-based vegetable garden?
11. What are some of the lessons you've learnt over the years with your school-based vegetable garden?