Teachers' perceptions of involving different role-players in school-based vegetable gardens in resource-constrained contexts

by

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Submitted in partial fulfilment of the requirements for the degree

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(Educational Psychology)

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PRETORIA

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DECLARATION OF ORIGINALITY

I, Tegan Leigh van der Westhuizen (student number 12224342), 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.

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Tegan Leigh van der Westhuizen
May 2019

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ETHICS STATEMENT

The author, whose name appears on the title page of this dissertation, has obtained, for the research described in this work, the applicable research ethics approval. The author declares that 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*.

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Tegan Leigh van der Westhuizen
May 2019

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ETHICAL CLEARANCE CERTIFICATE

UNIVERSITEIT VAN PRETORIA
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Faculty of Education

RESEARCH ETHICS COMMITTEE

CLEARANCE CERTIFICATE	CLEARANCE NUMBER: **EP 06/11/01 Ferreira 18-002**
DEGREE AND PROJECT	M.Ed Teachers' perceptions of involving different role-players in school-based vegetable gardens in resource-constrained contexts
INVESTIGATOR	Ms Tegan van der Westhuizen
DEPARTMENT	Educational Psychology
APPROVAL TO COMMENCE STUDY	04 May 2018
DATE OF CLEARANCE CERTIFICATE	09 May 2019

CHAIRPERSON OF ETHICS COMMITTEE: Prof Liesel Ebersöhn

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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.

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ABSTRACT

This study forms part of three broader research projects that focus on investigating ways in which teachers can promote resilience in resource-constrained contexts by means of implementing school health initiatives, such as school-based vegetable gardens. Following on a need identified within the broader research projects, the purpose of this study was to explore and describe teachers' perceptions of involving different groups of role-players in school-based vegetable gardens in resource-constrained contexts in an attempt to understand how different role-players may contribute to successful gardens. For this purpose, I focused on the experiences of 36 primary school teachers from nine schools in the Eastern Cape province who have been involved in school-based vegetable gardens in recent years.

I was guided by Ozer's (2007) model of potential effects of school gardens as theoretical framework, utilised interpretivism as meta-theory and followed a qualitative methodological approach. I selected a case study research design, applying Participatory Reflection and Action (PRA) principles. Data were generated and documented by means of a PRA-based workshop, five semi-structured interviews and observation-as-context-of-interaction, supported by visual and audio documentation techniques, field notes and a reflective journal. Following inductive thematic analysis, I identified four themes and related sub-themes. The themes relate to role-players often involved in school-based vegetable gardens as well as their respective responsibilities; benefits associated with involving the various role-players; factors that may support the successful establishment and maintenance of school-based vegetable gardens, and challenges experienced when involving the different role-players.

The findings of this study indicate that teachers experienced the role that different groups of people may fulfil positively despite some challenges associated with such involvement. More specifically, role-players in school-based vegetable gardens can significantly contribute to the success of such gardens by supporting teachers in developing innovative solutions to the challenges they face. Teachers and learners were found to be the primary role-players, supported by dedicated school principals and in many cases, one or two gardeners that may also be community members. Lastly, a dedicated garden coordinator (such as a teacher) and support by the national Department of Basic Education were found to be important.

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KEY WORDS

- Food Intake and Resilience Support: Gardens as Taught by Educators (FIRST-GATE) project
- Supporting Home Environments in Beating Adversity (SHEBA) project
- Supportive Teachers, Assets and Resilience (STAR) project
- Participatory Reflection and Action (PRA)
- Case study design applying PRA principles
- Health and food-related challenges
- Qualitative research
- Resource-constrained contexts
- Role-players in vegetable gardens
- School-based vegetable gardens

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DECLARATION – LANGUAGE EDITOR

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TO WHOM IT MAY CONCERN

I, the undersigned, hereby declare that the master's dissertation titled **Teachers' Perceptions of Involving Different Role-players in School-based Vegetable Gardens in Resource-constrained Contexts** [excluding the appendices] by Tegan Leigh van der Westhuizen has been edited for grammar errors. It remains the responsibility of the candidate to effect the recommended changes.

Prof. Tinus Kühn

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CHAPTER 1
INTRODUCTION TO THE STUDY

1.1 INTRODUCTION AND RATIONALE FOR UNDERTAKING THE STUDY

This study forms part of three broader ongoing research projects, namely the Supportive Teachers, Assets and Resilience (STAR, 2003–), Supporting Home Environments in Beating Adversity (SHEBA, 2011–), and Food Intake and Resilience Support: Gardens as Taught by Educators (FIRST-GATE, 2015–) projects. The STAR and SHEBA projects[1] have been investigating ways in which teachers, schools and volunteers can support learners and promote resilience in resource-constrained contexts (Ferreira, Ebersöhn, & Botha, 2013). For the FIRST-GATE project, the focus falls on the value of school-based vegetable gardens in resource-constrained communities in the Eastern Cape province, South Africa.

Findings of the three said projects indicate that schools in these communities regard school-based vegetable gardens as resources to support learners and address vulnerability. However, over the years it has become clear that different schools follow different approaches for vegetable gardens, with varying levels of success. Against this background I set out to explore teachers' perceptions of the involvement of different role-players in the establishment and maintenance of school-based vegetable gardens.

Due to the lack of sufficient resources in resource-constrained communities in South Africa, many individuals are unable to maintain a socially acceptable standard of living (Oldewage-Theron & Slabbert, 2008). Community members in these contexts typically face challenges of food insecurity, malnutrition and poor health (Ebersöhn, 2017; Oldewage-Theron & Slabbert, 2008). According to Rendall-Mkosi, Wenhold, and Sibanda (2013), one in five households in South Africa are considered to be food secure, while almost a third of South African households are living in absolute poverty.

In an attempt to combat poverty, food insecurity, hunger and malnutrition increased emphasis has been placed on initiatives such as school-based vegetable gardens in recent years. In this regard it seems important to manage school-based vegetable gardens in an effective manner so that they can be utilised optimally to support vulnerable communities. It is imperative that ongoing research is undertaken on the various aspects

[1] National Research Foundation-funded projects 74455 (Community Engagement Programme) and 93320 (Community Engagement Programme).

of school-based vegetable garden initiatives so that potential challenges can be better understood and solutions developed to address these. Insight into teachers' personal perceptions and the experiences of potential role-players in the establishment and maintenance of school-based vegetable gardens may, for example, inform future attempts to initiate successful gardens at schools (Rendall-Mkosi et al., 2013).

If school-based vegetable gardens are carefully managed they may have a positive effect on schools and their surrounding communities (Food and Agriculture Organization of the United Nations [FAO], 2010). As an example, I experienced the potential value of school-based vegetable gardens in 2015 when I was involved in such a project at an orphanage in a resource-constrained community, with the garden subsequently becoming a tool for learning as well as a sustainable resource. During my involvement in the project I was able to observe the effect that a garden may have on the members of an orphanage as well as on neighbouring community members. To this end I support Laurie, Faber, and Maduna's (2017) view that school-based vegetable gardens are a resource that can contribute to the lives of learners by, for example, providing food, addressing hunger and contributing to learners' general health and eating behaviour (Kupolati et al., 2016; Malongane & Mbhenyane, 2017).

1.2 PURPOSE AND AIM OF THE STUDY

The purpose of the current study was to explore and describe (Maree, 2016a) the perceptions of teachers on the involvement of different role-players in school-based vegetable gardens in resource-constrained communities in the Eastern Cape province, South Africa. To this end I focused on teachers' perceptions based on their own unique experiences, specifically with regard to the involvement of different role-players. More specifically, I explored teachers' perceptions of their own involvement and the involvement of others during the establishment and maintenance of school-based vegetable gardens (Nieuwenhuis, 2016b).

As such, I thus aimed to gain insight into teachers' views, beliefs and attitudes of potential role-players in establishing and maintaining successful school-based vegetable gardens. By understanding these perceptions, insight may be gained into the factors that may influence the success and sustainability of school-based vegetable gardens in South African resource-constrained communities.

1.3 RESEARCH QUESTIONS

The following primary research question guided my study: *What are teachers' perceptions of the involvement of different role-players in school-based vegetable gardens in resource-constrained contexts?*

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

- Which groups of role-players can potentially be involved in school-based vegetable gardens?
- What are the roles of each role-player?
- What is the value of involving different groups of role-players in school-based vegetable gardens?
- Which challenges may be experienced when involving different groups of role-players?

1.4 WORKING ASSUMPTIONS

I conducted this study against the background of the following working assumptions:

- Teachers' choice of whom to involve in school-based vegetable gardens depends on the level of participation that they expect of the various role-players.
- Teachers will assume an authoritative position in the establishment and maintenance of school-based vegetable gardens when involving others.
- Teachers will expect such role-players to fulfil a significant role in the development and maintenance of school-based vegetable gardens.
- Role-players can contribute to school-based vegetable gardens by fulfilling functions such as management, planting and harvesting.
- Teachers' perceptions of the value of various role-players will be affected by their own positive or negative experiences with such role-players in the past.

1.5 CONCEPT CLARIFICATION

In this section I clarify the core concepts related to this study.

1.5.1 TEACHERS IN RESOURCE-CONSTRAINED COMMUNITIES IN SOUTH AFRICA

A *teacher* is an individual whose role is to guide the growth of learners by supporting them to acquire the necessary knowledge and skills, and develop "an understanding of themselves, the world around them, and their place in that world" (Nations, 1962,[2] p. 101). Teachers are expected to act as leaders and managers in the school environment and to provide direction, structure, goals and guidance to their learners (Donald, Lazarus, & Moolla, 2014).

A *community* can be defined as "a group of people with diverse characteristics who are linked by social ties, share common perspectives, and engage in joint action in geographical locations or settings" (MacQueen et al., 2001, p. 1929). *Resource-constrained communities in South Africa* are typically aggravated by poverty and associated with structural disadvantage, which according to Ebersöhn (2017) and Theron and Van Rensburg (2018) refers to limited or a lack of available resources and opportunities, weakened sociocultural capital and increased levels of violence. These risk factors generally predict negative outcomes in communities, which may hinder community members' sense of security (Mampane, 2014; Theron & Van Rensburg, 2018).

In this study *teachers in resource-constrained communities* refer to primary school teachers in the Eastern Cape province who teach at the schools that have over the years participated in the STAR, SHEBA and FIRST-GATE projects. The communities where these teachers work lack sufficient healthcare, food and sanitation facilities (Baskaran & Mehta, 2016), and face high levels of poverty, unemployment, crime and social deprivation (Oldewage-Theron & Slabbert, 2008).

1.5.2 PERCEPTIONS

According to Roth and Jornet (2014), experience implies the active participation of individuals in activities and events, which means that skills, knowledge and perceptions are developed and acquired (Risenga & Davhana-Maselesele, 2017). *Perceptions* include opinions, obtained knowledge as well as beliefs and ideas that are based on an individual's previous experiences. Perceptions are thus developed through the active participation of individuals when knowledge, opinions and experiences are integrated in

[2] Even though this is a dated source, I regard it as a seminal source and therefore include it as reference.

order to create a perceived idea (Risenga & Davhana-Maselesele, 2017; Roth & Jornet, 2014).

In the context of this study perceptions refer to the teacher participants' knowledge, encounters, views and experiences that have informed their opinions and beliefs. In line with the focus of my study, these perceptions have specifically been developed and formulated while engaging with different role-players in the establishment and maintenance of school-based vegetable gardens in previous years.

1.5.3 ROLE-PLAYERS

Role-players refers to specific individuals who assume a particular role in a project or organisation. They typically have a specific function to fulfil, with associated allocated responsibilities unique to the project or organisation (Freeks, 2015).

In my study role-players refer to different groups of individuals who may be involved in the establishment, maintenance and/or management of school-based vegetable gardens in primary schools in the Eastern Cape province (FAO, 2010; Rendall-Mkosi et al., 2013). These may include teachers, learners, parents, community members and other stakeholders such as governmental and non-governmental organisations (NGOs).

1.5.4 SCHOOL-BASED VEGETABLE GARDENS

A *school-based vegetable garden* refers to an area of cultivated land that is near or on a school property, and is usually tended to by teachers and learners (FAO, 2010). These gardens typically produce fruits and vegetables, and may provide a platform to teach learners about sustainable food production. A core purpose of school-based vegetable gardens is "for education and skills building" (Rendall-Mkosi et al., 2013, p. vi).

For the purpose of my study school-based vegetable gardens include all the vegetable gardens of the schools that have been involved in the three broader research projects in recent years. In addition, only school- and community-based vegetable gardens at other schools or organisations where the participants were involved in the past form part of this concept as applied in my study.

1.6 THEORETICAL FRAMEWORK OF THE STUDY

I relied on Ozer's (2007) model of the potential effects of school gardens as theoretical framework for my study. Ozer's (2007) model proposes a social ecological-transactional perspective on human development where individuals' development is regarded to be

actively influenced over time by the interactions between individuals and their diverse, immediate contexts and ever-changing environments. According to this model, changes that occur in one component of an individual's system may influence other components in the system, with specific reference to school gardens and how these may influence surrounding school environments and individuals in these environments (Ozer, 2007).

As such, Ozer's (2007) model specifically focuses on how school-based vegetable gardens can influence surrounding school environments, which may in turn affect the teachers who are involved in such garden initiatives. School-based gardens are viewed as systemic school-level interventions that hold the potential to promote the well-being and health of individual learners in multiple areas of functioning, and support the school environment to become a positive setting for youth development. Ozer's model (2007) thus acknowledges the potential long-term (distal) and short-term (proximal) effects of school-based vegetable garden initiatives on learners, families and school systems. I explain the theoretical framework in more detail in Chapter 2.

1.7 PARADIGMATIC PERSPECTIVES

I relied on interpretivism as a *meta-theoretical paradigm*, thereby acknowledging that multiple realities exist and that reality is considered to be a socially constructed phenomenon (Morgan & Sklar, 2012; Pham, 2018). According to the interpretivist paradigm, individuals' experiences can only be understood from the viewpoint of those involved in and experiencing a phenomenon (Morgan & Sklar, 2012). As a result individuals' perspectives can be understood in the contexts of their lives (Snape & Spencer, 2003), allowing the researcher to gain insight into the perceptions and experiences of the participants (Ferreira, 2012). I selected interpretivism as I set out to explore the perceptions of teachers regarding the involvement of different groups of role-players in school-based vegetable gardens. To this end I focused on the meaning that teachers attribute to their own perceptions and attempted to understand their perspectives in their specific contexts (Mack, 2010; Pham, 2018; Snape & Spencer, 2003).

In undertaking this study, I followed a *qualitative methodological approach,* focusing on in-depth descriptions and the understanding of lived human experiences (Lichtman, 2006). As qualitative research recognises that social reality is subjective and created through individual human experience (Basit, 2010), I attempted to explain how social reality is perceived, experienced and created by the participants (Basit, 2010), thereby aligning with the interpretivist paradigm. In following a qualitative approach I was thus

able to involve a small number of participants that in turn allowed for rich data to be generated (Ivankova, Creswell, & Plano Clark, 2016). I was furthermore able to take on an interactive role during data generation and interpretation (Snape & Spencer, 2003). In this manner I was able to gain a comprehensive understanding of the phenomenon under study, based on the participants' personal experiences and the meaning they had given to this phenomenon in the past (De Vos, Strydom, Fouché, & Delport, 2005). More detailed discussions of my selected paradigms are included in Chapter 3.

1.8 RESEARCH METHODOLOGY

In this section I introduce the methodological choices I made. More detailed discussions of these aspects follow in Chapter 3.

1.8.1 RESEARCH DESIGN

I implemented a case study design, applying Participatory Reflection and Action (PRA) principles. According to Yin (2009) a case study design entails an in-depth investigation into a real-life phenomenon in a specific real-world context. Therefore, by utilising an exploratory case study design (Nieuwenhuis, 2016c) I was able to gain a detailed understanding of the teacher participants' perceptions and experiences by exploring these in their specific contexts.

Applying PRA principles, as suggested by Ebersöhn, Ferreira, and Mbongwe (2011), implies interaction with local people with the purpose of learning from their experiences and gaining an understanding of their surrounding contexts. Due to the nature of PRA, the participants formed an integral part of my study and were actively involved in data generation and interpretation processes (Ebersöhn et al., 2011). By utilising a case study design applying PRA principles, I was able to focus on primary school teachers who had been involved in school-based vegetable gardens in the past in resource-constrained settings.

1.8.2 SELECTION OF CASES AND PARTICIPANTS

As highlighted by Morgan and Sklar (2012), the selection of participants when utilising a case study design includes the selection of a case/s as well as the selection of participants in a specific environment. I conveniently selected nine cases and purposefully selected 36 teacher participants for this study. Convenience sampling implies the selection of cases or participants that are "easily and conveniently available" (Maree & Pietersen, 2016, p. 197), while purposive sampling occurs when a researcher

purposefully selects participants according to a specific set of criteria (Maree & Pietersen, 2016; Neuman, 2014).

As my study forms part of three broader research projects that several schools have been involved in over recent years, I conveniently selected the cases by merely including the nine schools that have formed part of the FIRST-GATE project since 2015. These schools were easily available and accessible due to their involvement in the broader project in the past. In purposefully selecting the teacher participants, I was able to select participants possessing the relevant knowledge and experience required to address my research questions (Mukherji & Albon, 2010). To this end I selected primary school teachers from the nine schools involved in the said broader projects, who had been involved in school-based vegetable garden projects in the past.

1.8.3 DATA GENERATION, DOCUMENTATION AND ANALYSIS

I relied on multiple data generation and documentation techniques, namely PRA-based workshops, activities and discussions (Chambers, 2004), semi-structured interviews (Creswell, 2014), observation-as-context-of-interaction (Angrosino & Mays de Pérez, 2000), field notes (Creswell, 2016), a reflective journal (Vannini, 2012) and audio-visual strategies (Creswell, 2014). In utilising a PRA-based workshop and semi-structured interviews I could rely on active participation by the teachers, their teamwork, active learning and collective knowledge to generate data (Ferreira & Ebersöhn, 2012). For this purpose I undertook two field visits to the Eastern Cape province, and co-facilitated[3] a two-hour PRA-based workshop (May 2018) and five semi-structured interviews (September 2018).

I documented the PRA-based workshop activities by taking photographs, audio-recording the feedback sessions, and taking the completed PRA-posters (matrices) as data sources. I documented all semi-structured interviews by once again making audio-recordings of the interviews, thereby capturing what had been said (Neuman, 2014). Photographs served as visual data source, in addition to the PRA-posters (matrices). Subsequent to the data generation process, I compiled verbatim transcripts of all audio-recordings for the purpose of data analysis and interpretation purposes (Chambers, 2002).

[3] I worked alongside another MEd student in Educational Psychology, Ms Lauren Jordaan, who focused on the role of school principals in the success of school-based vegetable gardens.

Throughout, I also relied on observation, which is described as the “act of noting a phenomenon, often with instruments, and recording it for scientific purposes” (Angrosino, 2007, p. 53). I more specifically utilised observation-as-context-of-interaction by fulfilling a membership role in the selected schools during field visits, and observing any collaborators and interactions that occurred (Angrosino & Mays de Pérez, 2000). Observation therefore formed a crucial part of the data generation and documentation activities, as I observed the interactions between teachers, their behavioural patterns as well as the discussions that took place during the PRA-based activities and the semi-structured interviews (Nieuwenhuis, 2016c).

I furthermore captured non-verbal information, my overall observations, and detailed descriptions of the existing knowledge base of the participants, as observed and experienced by me, in a reflective journal and field notes (Ferreira, 2006). By keeping a reflective journal, I documented my feelings and thoughts as well as my ongoing reflections and observations during the data generation process. I also reflected on the effect I might have had on the research process as well as the impact the research might have had on me (Mouton, 2001; Mukherji & Albon, 2010). Field notes allowed me to capture non-verbal cues, record the sequence of events during data generation and document what I had observed (Nieuwenhuis, 2016c).

I then completed inductive thematic analysis of all written documents, photographs, posters and transcribed audio-recordings (Neuman, 2014). Inductive thematic analysis involves the process of identifying and examining themes and patterns in a data set (Braun & Clarke, 2006). This way of analysis is considered as a bottom up approach where themes are created according to prominent trends identified within the generated data. By employing inductive thematic analysis, I was able to gain a detailed understanding of the participating teachers’ perceptions, and discover meaning in the data set, which in turn assisted me in addressing the research questions (Braun & Clarke, 2006). I elaborate on the processes of data generation, documentation and analysis I completed in Chapter 3.

1.9 ETHICAL CONSIDERATIONS

Throughout the research process I remained aware of systems of domination and structures of power, and attempted to prevent this from influencing the study (Cannella & Lincoln, 2018; Denzin & Lincoln, 2018). I respected the guidelines for ethical research as stipulated by the Ethics Committee of the Faculty of Education, University of Pretoria (University of Pretoria, 2015) and attended to ethical principles as discussed in this

section. The participants were treated respectfully at all times, protected from harm, and the principles of anonymity, confidentiality and trust were employed throughout the study (Elias & Theron, 2012).

1.9.1 PERMISSION TO CONDUCT RESEARCH, VOLUNTARY PARTICIPATION AND INFORMED CONSENT

According to Creswell (2016), prior to conducting a study, researchers require approval from their institutions, the research site as well as the participants. I obtained permission to conduct research from the Ethics Committee of the Faculty of Education, University of Pretoria before commencing with data generation. In addition, permission to conduct research was obtained from the nine schools and the Department of Basic Education as part of the broader research projects prior to my involvement.

When obtaining written informed consent, I explained the nature of my study and what the participants' involvement would entail (Christians, 2000; Elias & Theron, 2012). Due to the fact that English is not the participants' mother tongue, I discussed the informed consent forms with the participants and made sure that they understood the provided information before giving their consent. Neuman (2014) emphasises that no individual should be coerced into participating in any study, and highlights the importance of informing participants that they are to participate freely without being forced. To this end, when introducing my study, I explained its purpose and what participants' involvement would entail, emphasising that no individual would be forced to participate, and that the participants had the right to withdraw from the study and terminate their participation at any time (Neuman, 2014).

1.9.2 CONFIDENTIALITY, ANONYMITY AND RESPECT FOR PRIVACY

I took all necessary precautions possible to ensure the protection of the participants' privacy and maintain anonymity throughout the research process (Neuman, 2014). I protected the privacy and anonymity of the participants by not disclosing their identities at any point in the research process. To this end I respected confidentiality and the anonymity of the participants by giving each participant a number and each school an alias to safeguard their identities during data analysis and for the purpose of this report and dissemination of the findings (Creswell, 2016). I furthermore requested the participants to respect confidentiality and anonymity during the PRA-based workshop, even though I cannot guarantee that this request was adhered to, due to the participatory nature of the session.

All data are stored in a secure place at the University of Pretoria for a period of 15 years, in order to ensure the safe keeping of the data. The data includes all visual data, audio data, verbatim transcripts, field notes and a reflective journal. Only the research team and I had access to the data and all electronic data are password protected.

1.9.3 TRUST AND RESPECT

According to Neuman (2014), it is important to establish trust with participants and keep them informed about the procedures and processes involved in a study. Due to the participants' involvement in the broader STAR, SHEBA and FIRST-GATE projects in recent years, a level of trust and respect had already been established when my study commenced. Throughout, I respected the participants and remained aware of potential power differences that could occur between the participants and the research team. I viewed the participants as co-researchers in the research process and recognised their contributions as vital (Bergold & Thomas, 2012; Health Professions Council of South Africa [HPCSA], 2008).

In addition I attentively listened to the participants and respected their opinions, experiences and wishes. I did not deceive them in any way, and remained open and transparent (Christians, 2000). I openly discussed the research processes and procedures with the participants at the start of my study and highlighted the potential value of their participation (Cohen, Manion, & Morrison, 2011; Ferreira et al., 2013).

1.9.4 PROTECTION FROM HARM

Protection from harm is a core principle and asks of a researcher to protect participants from any possible physical or psychological harm (Neuman, 2014). I placed the welfare, health, dignity, rights and privacy of the participants above all other interests, and guarded against their being harmed in any way. I honoured the trust the participants placed on me in my capacity as researcher (Ferreira et al., 2013; HPCSA, 2008).

According to Neuman (2014) researchers should remain aware of all types of harm that may occur, and constantly guard against these to minimise risk. As such, researchers are required to anticipate possible risks to participants that may include basic safety risks, but also potential distress caused by participation (Neuman, 2014). As qualitative researcher, I remained aware of any potential stress or negative effects on the participants as a result of their participation, and guarded against these by keeping the generated data confidential and respecting the privacy of the participants and their contributions

(Christians, 2000; Neuman, 2014). I kept being on the lookout for any possible signs of distress; however no such incidences occurred.

1.10 QUALITY CRITERIA

Maree (2016a) defines trustworthiness as the degree to which concepts and interpretations in a qualitative study display a shared meaning between the researcher and participants. In support of trustworthiness I utilised several strategies for data generation, documentation and analysis (Maree & Hansen, 2011). Throughout, I strove to meet the criteria of credibility, transferability, dependability, confirmability and authenticity (Guba, 1981; Lincoln & Guba, 1985; Lincoln, Lyman, & Guba, 2018).

McGinn (2012) defines *credibility* as the extent to which the findings of a study are appropriate and believable, more specifically in terms of the level of agreement between the researcher and participants. I aimed for credibility by relying on member checking, crystallisation, debriefing sessions with my supervisor, keeping a reflective journal, and undertaking multiple site visits (Creswell, 2016; Silverman, 2017). I furthermore utilised several in-depth data generation methods, including observation of the participants. Moreover, I documented the decisions made and methods used during the entire research process in detail (Lincoln & Guba, 1985; Maree & Hansen, 2011; Nieuwenhuis, 2016a).

According to Dick (2014), *transferability* relates to the extent to which research findings can be applied to other studies and in other contexts. It differs from generalisability in that individuals are urged to form connections between their own research or experiences on the one hand, and elements of the specific study on the other (Nieuwenhuis, 2016a). As the current study is based on extensive descriptions of the participants it does not make any generalisable claims (Maree & Hansen, 2011; Nieuwenhuis, 2016a). Sufficient descriptions have been included in terms of the specific contexts of the cases that may enable the reader to decide about the applicability of transferring the research findings to other similar contexts (Lincoln & Guba, 1985; Maree & Hansen, 2011).

Dependability provides an indication of the extent to which research findings can be replicated with participants within a similar research setting (Maree, 2016a), with the findings being repeated as consistent (Pandey & Patnaik, 2014). Lincoln and Guba (1985) state that dependability relates to the research process being logical and well documented. In this study I documented the entire research process in detail in support of dependability, thereby making use of an audit trail (Guba, 1981; Lincoln & Guba, 1985).

I documented the process in a logical manner by making use of a reflective journal, field notes and photographs of what I had observed.

Nieuwenhuis (2016a) describes *confirmability* as the extent to which the findings of a study represent the views of the participants and not the motivations and biases of the researcher. Research findings should be confirmable by other individuals who are able to corroborate the findings (Maree, 2016a). By practising reflexivity, researchers are generally able to guard against researcher bias, personal interest and motivation interfering with the results of the study (Guba, 1981). To this end I documented the generated data as well as the methods I used and the decisions I made throughout the research process (Maree & Hansen, 2011). To enhance the confirmability of this study I include an audit trail. This may enable other researchers to examine the processes I utilised for data generation and analysis (Guba, 1981). The audit trail allowed me, as researcher, to keep a detailed record of my thoughts and decisions as the research process progressed (Guba, 1981; Lincoln & Guba, 1985).

Finally, *authenticity* refers to the degree to which research is worthwhile and will reflect the impact it has had on participants in their unique contexts. In this regard researchers seek reassurance that the conducting of the research is credible and genuine in terms of the participants' lived experiences (James, 2008). To this end educative and ontological authenticity refers to an increased level of awareness by research participants and by those individuals they come into contact with and who surround them. Catalytic and tactical authenticity imply the possibility of a study to empower participants and prompt them into action (Lincoln et al., 2018).

I attempted to ensure authenticity by gaining a detailed account of the teachers' experiences regarding the involvement of various role-players in school-based vegetable gardens. I conducted interviews to capture the participants' lived experiences and gain a detailed understanding of how they perceived the studied phenomenon (James, 2008; Lincoln & Guba, 1985).

1.11 OUTLINE OF THE CHAPTERS

This mini-dissertation is structured as set out below.

In **Chapter 1** I provide background to my study in terms of the rationale and purpose. I formulate research questions, state my working assumptions and explain the central concepts of the study. I introduce the theoretical framework, paradigmatic perspectives,

research process and methodological strategies, and discuss ethical considerations and quality criteria.

In **Chapter 2** I explore existing literature on the research topic, focusing on food-related trends in South Africa, community- and school-based vegetable garden initiatives, as well as potential role-players in such initiatives. I also explain the theoretical framework in more detail.

Chapter 3 focuses on the research design, and the epistemological and methodological approaches I followed. I also discuss and justify my selected methods of data generation, documentation and analysis.

In **Chapter 4** I present the results of my study in terms of the themes and sub-themes I identified during inductive thematic analysis. Next, I interpret the results in terms of existing literature, thus presenting the findings of the study.

In the final chapter I draw conclusions in terms of the formulated research questions. I indicate the potential contributions of the study and reflect on the challenges I experienced. Finally, I make recommendations for training, practice, policy and future research.

1.12 CONCLUSION

In this chapter I introduced the study I completed. I explained my rationale for undertaking the study as well as the purpose and working assumptions that guided me. After formulating research questions, I provided a brief overview of the selected paradigms, research design and methodological strategies for data generation, documentation and analysis. I also discussed ethical considerations and the quality criteria I respected in undertaking this research.

In the following chapter I explore existing literature in the field of community/school-based vegetable garden initiatives. I focus on literature related to health and food-related trends within South Africa, challenges experienced by individuals in resource-constrained communities, school-based vegetable garden initiatives, and the potential value of involving various role-players in school-based vegetable gardens. I conclude the chapter by explaining the theoretical framework of my study.

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CHAPTER 2
LITERATURE REVIEW

2.1 INTRODUCTION

In the previous chapter I provided an introduction and brief overview of the study. I discussed the rationale, stated the purpose and formulated research questions. Furthermore, I introduced the theoretical framework and research process. I also explained how I respected quality criteria and ethical considerations.

In this chapter I explore existing literature related to South Africa's current health and food-related status, national and school-based initiatives that address hunger, as well as school- and community-based vegetable gardens as potential avenue to mitigate food insecurity. I also explain the theoretical framework of the study in more detail.

2.2 CURRENT HEALTH AND FOOD-RELATED STATUS OF SOUTH AFRICAN RESOURCE-CONSTRAINED COMMUNITIES

According to Schönfeldt, Hall, and Pretorius (2018), South Africa is considered to be nationally food secure despite a large majority of the population living below the poverty line (Rendall-Mkosi et al., 2013). As such, a high percentage of South Africans live in resource-constrained communities with unreliable access to basic services and resources (De Cock et al., 2013; Lucke, Mamo, & Koenigstorfer, 2019). Oldewage-Theron, Duvenage, Egal, and Lyford (2018) posit that low-income households often also experience health and food-related challenges.

2.2.1 CHALLENGES GENERALLY EXPERIENCED BY RESOURCE-CONSTRAINED COMMUNITIES

Pillay (2014) states that South Africa has one of the highest rates of poverty and inequality in the world. More specifically, over 30.4 million South Africans lived in poverty in 2015, with 21.3% of all households experiencing inadequate access to food (Statistics South Africa, 2017a, 2017b). At the time, 24.7% of all South Africans were at risk of going hungry, while 12.1% individuals experienced actual hunger. In 2016, more than 1.5 million of all 0–6 year old children (of the 7.2 million children of this age) lived in households that had missed or skipped meals in the twelve months prior to the survey (Statistics South Africa, 2018a). Moreover, 19.9% of all households in South Africa reported that they had insufficient funds to buy food at some point in the twelve months prior to the survey, while 13.3% of all households had missed a meal (Statistics South Africa, 2016). Statistics such

as these emphasise the importance of food security policies, programmes and interventions in South Africa, which may include initiatives such as school-based vegetable gardens, in combating health and food-related challenges (Statistics South Africa, 2016, 2017b).

Food insecurity[4] is a major challenge experienced in resource-constrained communities (Misselhorn & Hendriks, 2017; Tshabalala, 2013). Food insecurity occurs when individuals have limited economic and physical access to safe, affordable and nutritious food that can meet their daily dietary needs (Statistics South Africa, 2016). According to a survey conducted by the African Food Security Urban Network (Crush, Frayne, & Pendleton, 2012), 57% of the households in resource-constrained communities can be classified as being food insecure (Battersby & Crush, 2014). In addition to this challenge, these communities generally have poorer access to quality food products, resulting in their having to pay more for poor quality food (Lucke et al., 2019).

Despite South Africa being a food secure country, malnutrition remains a problem (Brits et al., 2017). According to Schönfeldt et al. (2018), South Africa is currently in a nutrition transition where undernutrition, for example micronutrient deficiencies and stunting, co-exist with an increasing incidence of obesity as well as the associated consequences, such as cardiovascular disease and diabetes. In a study conducted by Kimani-Murage (2013) in Mpumalanga, South Africa, 18% of the children were stunted, 32% undernourished, 19% underweight and 25% overweight or obese. In another study conducted in the Western Cape, 19% of the children were found to experience stunting, 2% were underweight, and 20% were obese or overweight (Abrahams et al., 2011). In addition, the South African population is affected by elevated rates of communicable diseases, such as Human Immunodeficiency Virus (HIV), Acquired Immunodeficiency Syndrome (AIDS) and Tuberculosis (TB), chronic diseases and mental health difficulties (Frank & Jepson, 2013; Rendall-Mkosi et al., 2013).

As learners in resource-constrained communities generally consume less than the required daily nutrient intake, malnutrition and undernutrition have become serious challenges in many such communities in South Africa (Schönfeldt et al., 2018). This contributes to increased levels of poor learner development and limited capability to perform (Jowell, 2011; Lucke et al., 2019; Oosthuizen, Oldewage-Theron, & Napier,

[4] Even though South Africa as a country is food secure, quality food can often not reach all resource-constrained communities due to long distances, communities being on the outskirts of the country, the transport of food being expensive or families not having the financial means to travel to shops that sell quality food or purchase sufficient food for their basic needs. Therefore many communities or households are still food insecure due to the lack of sufficient quality food (Lucke et al., 2019).

2011; Schönfeldt, Gibson, & Vermeulen, 2010). In addition, malnutrition may increase a learner's susceptibility to diseases and infections (Sherman & Muehlhoff, 2007). In undertaking this study I was aware of the various health and food-related challenges that the research participants and potential role-players in school-based vegetable gardens may experience on a daily basis, as the context of the study was resource-constrained communities in the Eastern Cape province, South Africa.

2.2.2 IMPORTANCE OF ADDRESSING HEALTH AND FOOD-RELATED CHALLENGES

According to the United Nations Development Programme (UNDP) (UNDP, 2016) the current unsustainable production and consumption of food is causing ecosystems to extend beyond their limits worldwide, decreasing the possibility of sufficient resource provision that is essential to development and life. The UNDP (2016) maintains that communities are able to manage risk, enhance resilience and encourage well-being and prosperity when sustainable development is encouraged. Therefore interventions that promote sustainable food production practices as well as sustainable health and wellbeing may support long-term solutions to health and food-related challenges in South Africa (Ivers & Cullen, 2011; Metallinos-Katsara, Must, & Gorman, 2012).

According to Metallinos-Katsara et al. (2012) childhood is a critical phase of social-emotional and physical development. Poor nutrition and food insecurity can affect well-being and development in these areas, in turn affecting an individual's future functioning (Ivers & Cullen, 2011; Statistics South Africa, 2018b). Due to the notable influence of a child's early years in the establishment of lifelong dietary preferences, Turner et al. (2017) highlight the importance of promoting and establishing healthy eating habits among children and adolescents to prevent and address health and food-related challenges (Metallinos-Katsara et al., 2012). To this end the promotion of food security and advocating for national plans and policies to address food insecurity hold the potential to reduce the effects of health and food-related challenges in South African resource-constrained communities (Ivers & Cullen, 2011; Metallinos-Katsara et al., 2012; Statistics South Africa, 2018b).

2.3 ADDRESSING HEALTH AND FOOD-RELATED CHALLENGES IN RESOURCE-CONSTRAINED CONTEXTS

In this section, I explore and discuss examples of national, school- and community-based responses as attempts to address health and food-related challenges in South Africa .

2.3.1 NATIONAL RESPONSES TO HEALTH AND FOOD-RELATED CHALLENGES IN SOUTH AFRICAN RESOURCE-CONSTRAINED COMMUNITIES

Many interventions on national level have addressed health and food-related challenges in resource-constrained contexts in South Africa in recent years. These include the Integrated School Health Policy implemented in public schools in South Africa as the Integrated School Health Programme (ISHP), the National School Nutrition Programme (NSNP) and the Integrated Nutritional Programme (INP) (Claasen, Van der Hoeven, & Covic, 2016; Departments of Health & Basic Education, 2012; Rendall-Mkosi et al., 2013).

The ISHP aims to improve environmental conditions and the general health of learners in schools as well as address health barriers to learning with a view to improving learners' overall school experience (Department of Health [DoH], 2012; Departments of Health & Basic Education, 2012). As such, the ISHP aims to promote health among learners in a sustainable and effective way. In addition, the programme aims to support school communities in creating secure environments for instruction, learning and health promotion (DoH, 2012; Departments of Health & Basic Education, 2012).

Next, the NSNP is a policy implemented by the Department of Basic Education (DBE) that is aligned with the aims of the ISHP (Claasen et al., 2016; Department of Agriculture [DoA], 2002; Departments of Health & Basic Education, 2012; Rendall-Mkosi et al., 2013). In forming part of the Integrated Food Security Strategy for South Africa, the NSNP is a government-funded initiative that focuses on enhancing learning capacity and alleviating short-term hunger in resource-constrained communities (Malongane & Mbhenyane, 2017). It seeks to strengthen nutrition education, enhance learning by means of school feeding, build partnerships with stakeholders that contribute to the success of the programme, and promote vegetable gardens in schools (DBE, 2015; Malongane & Mbhenyane, 2017). In addition to addressing malnutrition and hunger, the promotion of school-based vegetable gardens is aimed at teaching learners skills to develop and maintain sustainable vegetable gardens (Rendall-Mkosi et al., 2013).

The NSNP is managed by provincial education departments who generally appoint external service providers to implement the programme in schools. The school feeding programme[5] of the NSNP had already been producing meals for over eight million learners every day by 2012 (South African Cities Network [SACN], 2015). The NSNP thus implies far-reaching sustainable benefits, and can form the basis for a holistic approach

[5] All public schools in South Africa are categorised as Quintile 1–5 schools, with Quintile 1 referring to schools with very limited available resources. The NSNP targets schools from Quintile 1, 2 and 3 that receive a meal for every child in the school every day of the school week (Rendall-Mkosi et al., 2013).

to addressing food insecurity in South African resource-constrained communities (Rendall-Mkosi et al., 2013; SACN, 2015).

In support of these programmes, the INP emphasises the important role of nutrition in human growth, survival, physical and psychological development, productivity and performance from childhood into adulthood (Departments of Health & Basic Education, 2012). This programme addresses the strategic focus areas of household food security, growth promotion and monitoring, nutritional education, promotion and advocacy, micronutrient malnutrition control, and nutritional intervention programmes for individuals with HIV, AIDS and TB, among others (Departments of Health & Basic Education, 2012; SACN, 2015). Interventions of this programme cover aspects such as healthy eating habits, responsible lifestyles and physical activity (SACN, 2015).

Implementation of the ISHP and NSNP in South African schools is regarded as the responsibility of the School-Based-Support-Team (SBST). This task includes the management of school-based vegetable garden initiatives (DBE, 2015; Departments of Health & Basic Education, 2012). The SBST is usually supervised by the school principal, and typically includes the Life Orientation/Life Skills teacher, representatives from the school-governing body (SGB), and other teachers and learners. A designated Life Orientation/Life Skills teacher may also coordinate the school health programme (Departments of Health & Basic Education, 2012). The responsibilities of such a teacher include the liaison with and mobilisation of the school community (teachers, SBG and other role-players), managing any equipment, and building partnerships with community organisations (Departments of Health & Basic Education, 2012).

According to the Departments of Health and Basic Education (2012) the DBE should furthermore be involved in the implementation of the ISHP as well as the NSNP, by creating an enabling environment for health promotion initiatives in all schools in South Africa. The overall role of the DBE includes managing and monitoring the specific programme, facilitating access to services and schools, and networking with role-players (Departments of Health & Basic Education, 2012). On a provincial level the DBE's responsibilities include the establishment of a task team with representatives from the DOH, the Department of Social Development (DSD), the DBE and other relevant stakeholders. Other key responsibilities include the development of a five-year implementation plan; securing resources; identifying disadvantaged schools; ensuring that all relevant staff members receive training, and monitoring the implementation of school health programmes (Departments of Health & Basic Education, 2012).

At district level, the responsibilities of the DBE include ensuring that school health programmes are implemented in all districts; that school health programmes reach all learners and schools, and that a District-Based-Support-Team (DBST) is established to implement school health initiatives (Departments of Health & Basic Education, 2012). However, according to Laurie et al. (2017), the DBE currently provides support and resources to only 50% of all schools in South Africa with regard to school-based vegetable gardens. The DoA provides support in the form of training that addresses food production as well as the provision of material resources (Laurie et al., 2017).

2.3.2 SCHOOL- AND COMMUNITY-BASED INITIATIVES TO ADDRESS HEALTH AND FOOD-RELATED CHALLENGES

In South Africa, some examples of school- and community-based initiatives include the EduPlant School Gardening and Nutrition Programme (Food and Trees for Africa, n.d.), which is endorsed by the Department of Basic Education (FAO, 2010); the FIRST-GATE project (Food Intake and Resilience Support: Gardens as Taught by Educators) of Ferreira and Ebersöhn (Chambati, 2017); the School Food Gardens Programme of the NSNP (DBE, 2015); the Nestlé Healthy Kids Programme (DBE, 2015), and the Food Gardens in Support of Poverty Alleviation and Reduction Policy project (City of Cape Town, 2013).

The EduPlant programme entails a series of school-based vegetable garden interventions. This programme focuses on learners, schools and their immediate communities. It aims to develop school-linked health and food security in resource-constrained communities throughout South Africa (FAO, 2010; Food and Trees for Africa, n.d.), thereby contributing to the NSNP feeding programme and the overall health of learners as well as learners' development. Additionally, EduPlant's projects encourage collaboration within communities, and among teachers, parents and learners. EduPlant can assist schools by conducting participatory educational workshops as well as by providing equipment and resources to schools, for example seeds and garden tools (Food and Trees for Africa, n.d.).

As indicated in Chapter 1, the FIRST-GATE project is a broad research project that commenced in 2015 and focuses on teacher-to-teacher transferral of knowledge and skills with regard to sustainable school-based vegetable gardens. The project aims to provide school-based staff members involved in vegetable gardens with support, the opportunity to share and gain ideas from others as well as discuss the challenges and

achievements experienced (FIRST-GATE Project in support of health and wellbeing, 2018). The current study forms part of the FIRST-GATE project.

The School Food Gardens Programme forms a pillar of the NSNP and aims to support the development of knowledge and skills for the production of food. It provides schools and teachers with a resource for instruction and learning (DBE, 2015). Participating schools are required to establish and implement food production initiatives, more specifically to establish their own vegetable gardens. The DBE's role is to purchase and distribute vegetable tunnels as well as other agricultural resources to schools to support them in sustaining their gardens (DBE, 2015; Rendall-Mkosi et al., 2013).

The Nestlé Healthy Kids Programme (DBE, 2015; Nestlé, n.d.), in partnership with the DBE, aims at raising health and nutrition knowledge among learners, teachers and parents. This programme focuses on healthy eating habits, the importance of physical activity and understanding a nutritional diet. It follows a multi-partnership approach, where Nestlé partners with organisations, sport federations and health institutes, aiming to promote health through the Life Skills curriculum (Nestlé, n.d.).

Lastly, the Food Gardens in Support of Poverty Alleviation and Reduction Policy attempts to start food gardens for disadvantaged individuals in Cape Town, South Africa (City of Cape Town, 2013). This intervention strives to address poverty, and to improve the quality of life of individuals who are vulnerable, poor and marginalised. This programme is once again aligned with the National Development Plan (NDP) as it aims for the active participation of all South Africans in their own sustainable health development, by *inter alia* encouraging positive collaboration between the public and private sectors (City of Cape Town, 2013; National Planning Commission, 2012).

2.4 SCHOOL- AND COMMUNITY-BASED VEGETABLE GARDENS IN RESPONSE TO HEALTH AND FOOD-RELATED CHALLENGES

In this section I explore and discuss existing literature on the potential value of school- and community-based vegetable gardens in addressing health and food-related challenges.

2.4.1 VALUE OF SCHOOL- AND COMMUNITY-BASED VEGETABLE GARDENS IN RESOURCE-CONSTRAINED COMMUNITIES

According to Burt, Koch, and Contento (2017), school- and community-based vegetable gardens have proven to be a valued educational tool that can address multi-faceted

issues, such as food security, sustainable food development, and health and life style preferences (Al-Mayahi, Al-Ismaily, Gibreel, Kacimov, & Al-Maktoumi, 2019). In recent years, many nutrition-related benefits have been associated with school-based vegetable gardens, including increased consumption of fruits and vegetables, increased nutrition and food knowledge, nutritional and food security, physical health promotion, improved academic achievement in Science and Mathematics, and better physiological and psychological outcomes, where learners develop a sense of responsibility and take ownership for gardens and their sustainability (Al-Mayahi et al., 2019; Burt et al., 2017; Kota, 2015; Stors & Heymann, 2017).

According to Johnson and Duffek (2008), learners can gain self-confidence and develop better self-esteem when actively involved in vegetable gardens. They can be motivated when planting and caring for vegetables, and observing their successes. Furthermore, learners will typically become more mindful of making healthy nutritional choices and more aware of their own health status (Shimpo, Wesener, & McWilliam, 2019).

To this end, Shimpo et al. (2019) emphasise the important role that school- and community-based vegetable gardens can play in community recovery and the development of community resilience. In this regard, such gardens hold the potential to provide support systems and sustainable resources, which in turn can address poverty and support quality of life by yielding nutritious produce and providing individuals with food resources (City of Cape Town, 2013). In addition, individuals may potentially generate funds by selling garden produce (Lucke et al., 2019; Pourias, Aubry, & Duchemin, 2016). In the opinion of Lucke et al. (2019), school- and community-based vegetable gardens can provide a viable option for eradicating food insecurity, hunger and malnutrition by allowing individuals to establish gardens that can produce crops in a shared space in collaboration with other members of the community.

Rendall-Mkosi et al. (2013) regard education as a key governmental function that can reach over 95% of South African children. Therefore, school-based vegetable garden initiatives can reach and influence a vast number of individuals on a daily basis. According to Mawela and Van den Berg (2018), schools can provide food to needy learners, educate them regarding nutrition and health-related challenges, and present them with skills that may support them in overcoming health and food-related challenges. School-based vegetable gardens can thus support sustainable health development among learners (Laurie et al., 2017; Rendall-Mkosi et al., 2013).

As a result, school-based vegetable gardens have become the focus of many interventions that aim to address malnutrition and hunger in resource-constrained contexts. Such gardens can enable learners, teachers and community members to participate in sustainable food production (Laurie et al., 2017), while promoting healthy dietary habits that may influence them throughout their lives (Oldewage-Theron & Egal, 2010, 2015). Vegetable gardens can thus be beneficial in contexts where food-related challenges occur, as school gardens generally imply the opportunity for learners and teachers to consume some of the garden produce, thereby increasing their knowledge of healthy eating habits (Boeing et al., 2012; Burt et al., 2017; Laurie et al., 2017).

Nutritional support is considered to be an essential tool to combat health and food-related challenges as it can support people to realise their intellectual and physical potential (Statistics South Africa, 2018b). In this regard Lucke et al. (2019) believe that food insecurity can be overcome and nutritional support provided when involving people in growing their own food. This idea is supported by the City of Cape Town (2013) project that realises that poverty can be addressed through food garden initiatives, with the potential of addressing food insecurity. Learners and community members may as a result be able to form a link between addressing hunger on the one hand, and learning about sustainable food production on the other. By maintaining vegetable gardens, learners may furthermore benefit from the opportunity to strengthen their social interactions and increase their resilience (Banning, 2015; Shimpo et al., 2019).

2.4.2 ESTABLISHMENT AND MAINTENANCE OF SCHOOL-BASED VEGETABLE GARDENS IN RESOURCE-CONSTRAINED CONTEXTS

The establishment and maintenance of school-based vegetable gardens entails a complex and ongoing process, which requires the involvement of several role-players throughout the year. Important steps involved in the process of establishing a vegetable garden involve the administrative approval and support from the school principal and SGB members; establishing a supportive network of role-players; obtaining funds as well as garden equipment and supplies, and planting, maintaining and sustaining the garden (Collective School Garden Network, 2015b; Rendall-Mkosi et al., 2013).

School principals play an important role in the establishment and maintenance of school-based vegetable gardens as they can support teachers to develop an outline for the garden, decide which role-players to involve, and develop a plan of action (Mawela & Van den Berg, 2018). According to the Collective School Garden Network (2015b), a supportive principal is key to the successful development of a vegetable garden, as such

a principal can allow teachers to work in the garden, network with stakeholders, and apply for funds and resources. Principals can also promote their school gardens in the district, leading to further involvement by other role-players. Local government officials, such as individuals from the DBE, can also fulfil a central role by providing support in the form of funding and equipment (DBE, 2015; Rendall-Mkosi et al., 2013).

For the establishment of successful vegetable gardens various role-players who may benefit both directly and indirectly can be involved. For example, community members can be involved in taking care of safety and security by looking after the garden when school-based role-players cannot, such as during school holidays (Collective School Garden Network, 2015a, 2015b). In order to ensure the success of school-based vegetable gardens, it is important that one person take the lead in the form of a garden coordinator, who can take responsibility for organising and supervising all garden activities. This individual can be a teacher who is committed and can take ownership for establishing a sustainable garden as resource for learners and the surrounding community, yet it can also be someone else other than a teacher (Collective School Garden Network, 2015b; DBE, 2015; Department of Education [DoE], 2009).

As knowledge and skills are developed and transferred during garden initiatives, informed people are needed when establishing and maintaining a school-based vegetable garden (Pourias et al., 2016). As such, individuals who can pass the necessary knowledge and skills onto children and other individuals need to partake. Interaction with experienced gardeners is, for example, considered a potential way in which individuals can acquire new knowledge and skills (Collective School Garden Network, 2015b). When teachers are involved in the establishment and maintenance of school-based vegetable gardens they may furthermore be required to learn how to teach new lessons or teach old lessons in new ways by integrating the vegetable garden. Classroom management issues may arise when starting to teach in a garden, and teachers may be required to adapt their teaching practices (Burt et al., 2017). As teachers become more familiar with vegetable garden-based teaching, they may however start incorporating such activities in more lessons.

Once a plan of action for a vegetable garden has been established, the involved role-players need to cultivate the land, plant seeds and establish the roles and responsibilities of the various role-players to maintain the garden. Maintaining school-based vegetable gardens in a successful way can only be achieved by attending to a set of activities, such as planting, watering, weeding, mulching, fertilising, monitoring for pests and harvesting (Collective School Garden Network, 2015a; Johnson & Duffek, 2008). Learners can be

involved in these activities, potentially as part of curriculum enrichment activities (Johnson & Duffek, 2008) yet also on a voluntary basis outside classroom time. Teachers may in this way act as supervisors and organisers by coordinating learners who take part. If school-based vegetable gardens are incorporated into the school curriculum, it may become a valuable educational tool for teachers and a learning instrument for learners, thereby enhancing the possibility of sustainability of the garden (Collective School Garden Network, 2015c).

Finally, international evidence suggests that the successful implementation of school health programmes is dependent on establishing strong partnerships between teachers, community members, learners and other stakeholders who are involved (Departments of Health & Basic Education, 2012). National and provincial governmental departments should thus ensure sufficient co-ordination between all relevant role-players that are related to school health programmes, by arranging regular meetings with the various stakeholders to ensure successful implementation on all levels (Departments of Health & Basic Education, 2012). In conclusion, the establishment of vegetable gardens at schools can thus attract various role-players that may in turn contribute to maintaining these and benefit from advantages on various levels (Johnson & Duffek, 2008).

2.4.3 POTENTIAL ROLE-PLAYERS IN SCHOOL-BASED VEGETABLE GARDENS

School-based vegetable gardens can only be successful and sustained if a diverse team of individuals are involved. Teachers, other school-based staff members, learners, parents, maintenance staff (gardeners and caretakers), non-governmental organisations (NGOs), governmental departments and community members can be involved to fulfil a role in garden planning and maintenance (Rendall-Mkosi et al., 2013). When receiving the support of a variety of role-players, resources may increase, active participation can occur and the overall garden initiative can be strengthened as a result (Collective School Garden Network, 2015b, 2015c; Department of Planning, Monitoring and Evaluation & DBE, 2016; Johnson & Duffek, 2008).

According to the South African Department of Education's (2009) NSNP, the management structure of school-based vegetable gardens includes specific role-players. These are the principal, a designated teacher as NSNP School Coordinator, a Nutrition Committee and SGB members (DoE, 2009). In addition, learners, parents, governmental officials and NGOs, as well as organisations from the private sector can be involved (DoE, 2009; Rendall-Mkosi et al., 2013). Note should however be taken that the role-players

involved in school-based vegetable gardens are mostly involved on a voluntary basis (Shimpo et al., 2019).

The DoE (2009) indicates that school principals need to assume a managerial role in the NSNP programme, taking overall responsibility for the management and sustainment of school-based vegetable gardens in order to ensure success (DoE, 2009). The responsibilities of the principal generally centre on the management of allocated funds, budgeting, and procuring and buying equipment and resources (Mawela & Van den Berg, 2018). SGBs generally assume a supportive role by addressing difficulties that are experienced and attending to requirements of the NSNP where possible. Furthermore, the SGB can identify unemployed parents from within the school community who may become involved in a school-based vegetable garden and contribute to the maintenance of the garden (DoE, 2009). The SGB can also provide support to principals, teachers and other staff members for them to be able to better fulfil their roles and responsibilities (Qila & Tylio, 2014).

The NSNP School Coordinator or designated full-time teacher, who is typically identified by the principal, should take on the operational responsibility for the school-based vegetable garden. To this end, such a teacher has to supervise the daily running of the programme by receiving stock, keeping records of all costs and the number of learners who are fed per day, and managing the vegetable garden (DoE, 2009). The NSNP School Coordinator is required to support the principal by ensuring that all role-players implement the garden initiative in accordance with the NSNP guidelines (Mawela & Van den Berg, 2018). If the NSNP School Coordinator, or designated teacher, successfully supervises and manages a school-based vegetable garden, all role-players may gain valuable knowledge and skills (DoE, 2009). A study conducted by Shimpo et al. (2019) confirms the importance of such a dedicated coordinator for the ongoing success and sustainability of a school-based vegetable garden.

Even though teachers are not forced to participate in the NSNP, which is regarded as an extra-mural activity, teachers often take part (Rendall-Mkosi et al., 2013), with community involvement being limited. In a survey conducted to assess the implementation of the NSNP (Department of Planning, Monitoring and Evaluation & DBE, 2016) strong participation at school level by both principals and teachers was indicated. Teachers therefore seemingly play a crucial role in vegetable gardens, generally fulfilling the role of managing them. In addition, teachers may coordinate activities and promote the value of vegetable gardens in the school and community (Rendall-Mkosi et al., 2013; Somerset & Markwell, 2009). Involving teachers as role-players in school-based vegetable gardens

can be of particular value due to their having a sound understanding of the curriculum and how garden activities can be integrated with learning content. Teachers furthermore have access to learners on a daily basis and spend ample time at school (Collective School Garden Network, 2015b).

Gardeners and caretakers may be involved in school-based vegetable gardens and provide support in the form of resources, or looking after the garden all year-round even during school holidays (Collective School Garden Network, 2015b). In a study conducted by Pourias et al. (2016) gardeners did not seem concerned about budget saving or food security issues but were more interested in being exposed to nature, and in the quality of produce and the potential educational functions of vegetable gardens.

According to Oldewage-Theron et al. (2018), it is important to also involve community leaders as if they are involved in garden-related activities an increase in responsibility and self-sufficiency of other role-players will follow. To this end, sustainable community participation as well as knowledge and skills transfer may be ensured when individuals in leadership positions in school and community environments become involved in vegetable gardens (Oldewage-Theron et al., 2018). This may in turn promote food security (Oldewage-Theron & Egal, 2015). Community members can support vegetable gardens by physically assisting in the maintenance of the gardens and also transferring indigenous and practical knowledge and skills to others (Cilliers et al., 2018).

According to Rendall-Mkosi et al. (2013), community participation in the establishment of school-based vegetable gardens is however often limited. Findings of a survey conducted by the Department of Planning, Monitoring and Evaluation and DBE (2016) confirm this belief by indicating poor participation by community and SGB members in vegetable gardens. In this respect schools may establish nutrition committees compiled of, for example, the NSNP School Coordinator, school administrators, SGB members and a gardener. These committees can subsequently coordinate the management of school-based vegetable gardens and any role-players involved (DoE, 2009).

In addition to the role-players already indicated, NGOs such as EduPlant (Food and Trees for Africa, n.d.) and Nestlé may provide support for vegetable garden initiatives, for example by conducting workshops with teachers, learners and gardeners on how to establish and sustain vegetable gardens (DBE, 2015). EduPlant, for example, offers interactive, participatory workshops for learners, teachers, principals and other stakeholders on the fundamentals of how to manage vegetable gardens (DBE, 2015; Food and Trees for Africa, n.d.). In addition, EduPlant provides schools with equipment

and resources, such as seeds, tools and educational material, for example posters and booklets. EduPlant furthermore promotes the integration of vegetable gardens with the school curriculum by providing stakeholders with activities that can be implemented in the garden (Food and Trees for Africa, n.d.). In the same manner, the DBE has conducted workshops with principals and gardeners on the management of garden programmes (DBE, 2015). NGOs may provide technical knowledge and support for food production as well as funds and skills development opportunities (Cilliers et al., 2018).

According to Rendall-Mkosi et al. (2013), learners are often involved in school-based vegetable gardens. In this way, learners can be encouraged to support school health initiatives while being empowered to become active participants in their own development. By involving learners they can become committed and invested in school-based vegetable gardens while developing a sense of responsibility and respect for gardens (Collective School Garden Network, 2015b). If learners are encouraged to participate in decision-making processes for gardens they may also develop a sense of motivation and ownership (Collective School Garden Network, 2015b; 2015c).

In summary, research (FAO, 2005) indicates that an experienced teacher should take the lead in school-based vegetable garden projects, supported by parents, community members, learners, other school teachers and school ground staff. However, limited research has been conducted on the exact role-players and their functions. Some studies (Rendall-Mkosi et al., 2013, p. 43) indicate that teachers and learners are the key role-players, as “the main role of the vegetable garden [is] seen as being for teaching purposes”; yet other studies (Pourias et al., 2016) refer to other role-players.

2.4.4 CHALLENGES OF INVOLVING VARIOUS ROLE-PLAYERS IN SCHOOL- BASED VEGETABLE GARDENS

According to Al-Mayahi et al. (2019), a few challenges can be associated with involving different role-players in the establishment and maintenance of school-based vegetable gardens despite various benefits. One such challenge relates to team members unnecessarily utilising and wasting large quantities of water that will in turn have a negative effect on the surrounding community, especially in arid or drought-affected areas (Al-Mayahi et al., 2019; Miller & Buys, 2008). A lack of commitment and support by parents and SGB members has also been indicated as a challenge that often negatively affects school-based vegetable gardens (Laurie et al., 2017).

School nutrition programmes and specifically school-based vegetable garden initiatives imply several management-related challenges (Mawela & Van den Berg, 2018). In this

regard limited research exists on how school nutrition programmes can be managed successfully (Mawela & Van den Berg, 2018). A lack of sufficient knowledge by principals and NSNP School Coordinators may for example result in their feeling overwhelmed and unsure of how to implement a school nutrition programme. Teachers and principals may furthermore be of the opinion that the management of a school-based vegetable garden will compromise their ability to teach effectively and focus on their learners. Teachers may, for example, feel that a full-time person who is solely responsible for a school-based vegetable garden would be a better option (Mawela & Van den Berg, 2018; Qila & Tylio, 2014). Mawela and Van den Berg (2018) posit that the processes involved in the management of the NSNP need attention, with a specific focus on the promotion of sustainable food production and meaningful collaboration between school-based staff members, governmental officials and other stakeholders.

An additional challenge associated with the involvement of various role-players in school-based vegetable gardens relates to teachers not being committed and not taking ownership of such initiatives due to their participation implying additional work without compensation (Mawela & Van den Berg, 2018). Teachers primarily focus on teaching and making sure that they complete the prescribed curriculum on time. A related challenge entails teachers' uncertainty as to how the curriculum and extra-curricular activities can be linked to a school-based vegetable garden (Laurie et al., 2017). According to the Department of Planning, Monitoring and Evaluation and DBE (2016) survey, teachers hold the view that they may lose valuable teaching time when incorporating vegetable garden activities in their work, which may negatively impact their teaching and increase their administrative load.

The fact that many teachers are untrained to participate in vegetable garden activities and may need human resource and time management training to be able to balance their teaching and garden responsibilities is closely related (Mawela & Van den Berg, 2018). In addition, the training of school-based role-players on the NSNP and the implementation of school-based vegetable garden initiatives has been indicated as not sufficient thus far (Langsford, 2012; Rendall-Mkosi et al., 2013). In this regard the study by the Department of Planning, Monitoring and Evaluation and DBE (2016) indicates that 40% of all school-based role-players do not receive training on the NSNP. These role-players include school principals, NSNP School Coordinators, teachers, SBG members and school administration staff. According to Laurie et al. (2017), role-players may thus lack the necessary knowledge and skills to manage school-based vegetable gardens. A lack of food production knowledge can, for example, in turn weaken the potential contribution

that school-based vegetable gardens may make to the health and food-related status of learners and the community (Pourias et al., 2016).

Finally, a lack of basic resources and financial support can pose many challenges to establish and sustain a school-based vegetable garden. Aspects such as a lack of fencing, garden equipment, water, seeds and funds often pose challenges when planning a school-based vegetable garden (Laurie et al., 2017). Similarly, a lack of equipment to address pest infestations and diseases, poor soil quality and limited commitment of role-players may be experienced as challenges by role-players involved in vegetable garden initiatives (Laurie et al., 2017; Rendall-Mkosi et al., 2013). In a study by Qila and Tylio (2014), another challenge experienced by individuals involved in school-based vegetable gardens relates to the theft of garden produce. In this regard, Cilliers et al. (2018) as well as Rendall-Mkosi et al. (2013) refer to insufficient security as a distinct challenge that may prevent the successful implementation of school-based vegetable gardens as crops and equipment may be stolen from the gardens.

In summary, a study by Laurie et al. (2017) indicates the lack of sufficient garden equipment (47%), lack of funds (59%), problems with garden workers (53%) and limited technical support (50%) as core challenges when establishing and attempting to maintain a school-based vegetable garden. According to the Department of Planning, Monitoring and Evaluation and DBE (2016), the disbursement of funds and equipment remains to be a challenge, resulting in some schools not implementing the NSNP programme as envisioned by the DBE.

2.5 THEORETICAL FRAMEWORK OF THE STUDY

I relied on Ozer's (2007) model of the potential effects of school gardens as theoretical framework for the current study. Ozer's (2007) model draws on Bronfenbrenner's (2005) bioecological model and community psychology theory in conceptualising school-based vegetable gardens as systemic school-level interventions that possess the potential of promoting the health of learners in various contexts. This principle implies the possibility of strengthening the school environment as a context for positive development.

By drawing on a social ecological-transactional perspective of human development, Ozer's (2007) model views the individual learner as nested in microsystems, for example the family, school and community. These microsystems interact with the learner while also reciprocally interacting with each other over the course of a learner's life time to shape development. As such, Ozer's (2007) model takes into consideration how changes in one system may produce changes in other systems. For example, changes in the

school environment may lead to changes in the community and family environments (Ozer, 2007). Figure 2.1 provides an overview of the theoretical framework that guided me in conducting my research.

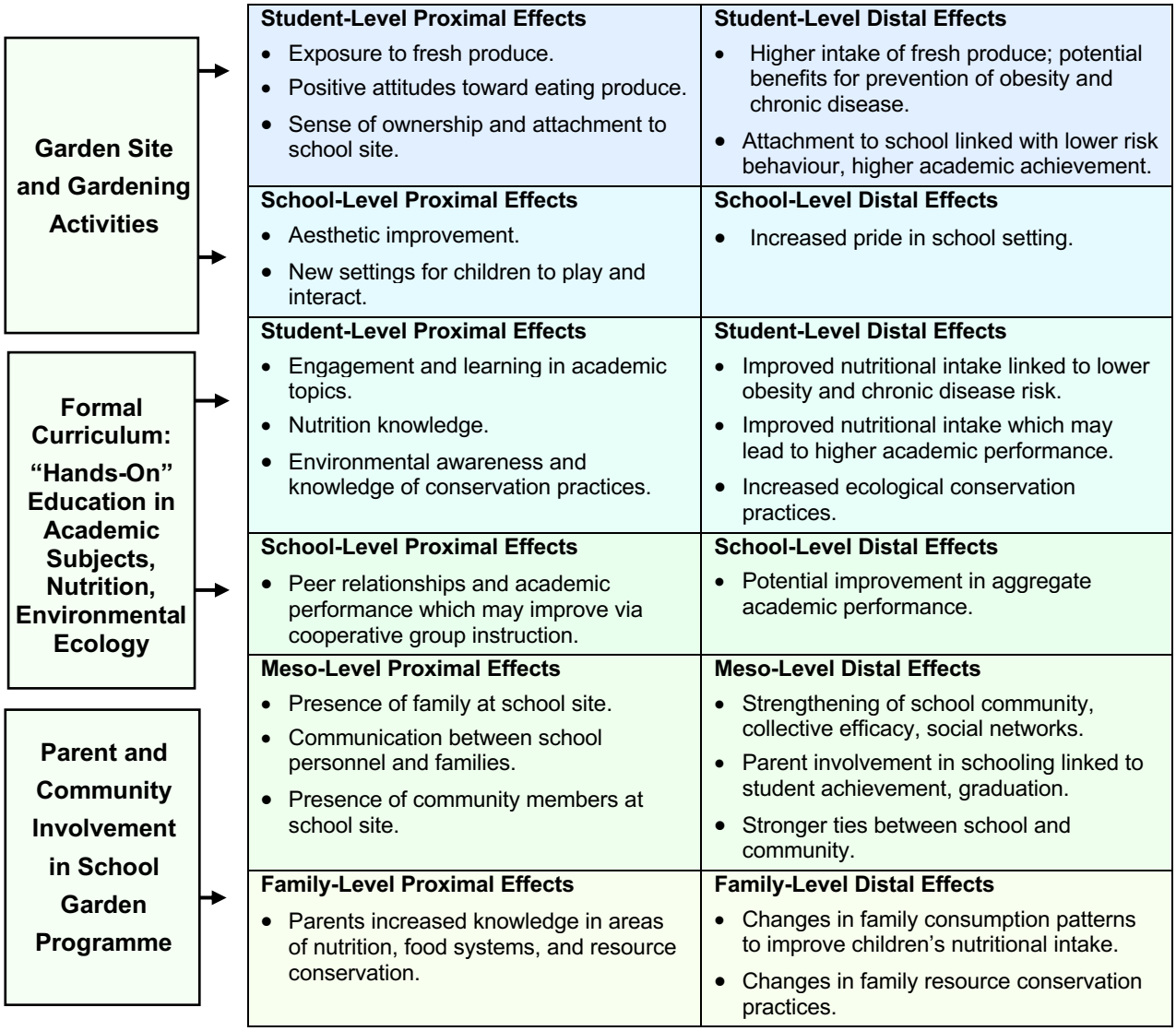

Figure 2.1: Theoretical framework of the study (Ozer, 2007, p. 852)

Ozer's (2007) model examines and explores factors that may contribute to utilising school-based vegetable gardens as an effective education tool. For this purpose the model focuses on three main categories, namely garden activities and site, formal curriculum, and community and parent involvement (Burt et al., 2017). Ozer's (2007) model suggests that potential short-term (proximal) and long-term (distal) effects of school-based vegetable gardens can be conceptualised on various levels, with proximal effects relating to short-term influences, while distal effects refer to long-term influences. Examples of proximal effects include vegetable gardens affecting communication between school staff members and parents; while distal effects relate to vegetable

gardens effecting the relationships between community members, staff and parents, thereby potentially strengthening such relationships (Ozer, 2007).

Ozer's (2007) model considers the direct and indirect influences and effects that each component of school garden programmes may have on various microsystems. These include the individual learner, the school and family microsystems, and the interconnections between the various microsystems (mesosystems) (Ozer, 2007). According to Ozer (2007), multiple ways exist in which school-based vegetable gardens can strengthen learners' healthy development, such as nutrition intake, academic achievement and engagement, and developing a sense of connection with the school. Simultaneously, qualities of the school environment and the relationships between families, schools and the community can be strengthened (Ozer, 2007).

I utilised Ozer's (2007) model as a lens through which I could view the various role-players that may participate in school-based vegetable gardens. This model supported me in interpreting the data and gaining an understanding of the teachers' experiences of involving various role-players. The potential proximal effects of school-based vegetable gardens in the context of my study, within the school system, included the potential development of new settings where learners can interact and play (Ozer, 2007). In terms of the learners' system, the development of a sense of ownership and attachment to school-based vegetable gardens and the acquisition and development of nutrition knowledge seemed possible, while on the family level an increase in parents' knowledge on food, nutrition and resources could have occurred (Ozer, 2007). On the meso-level, the potential proximal effects included an increased presence of parents and community members at school-based vegetable garden sites, as well as more regular communication between school-based staff and other role-players (Ozer, 2007).

In the context of my study the potential distal effects included learners possibly consuming fresh garden produce, as well as the prevention of possible health risks such as obesity (Ozer, 2007) as a result of the involvement of various role-players. Schools could perhaps express feelings of pride in their school environments, while families could adapt and change their food consumption practices to include more nutritional food options. In the long-term the possibility of stronger relationships between the community and school seemed possible as well as increased parent involvement in the management of school-based vegetable gardens (Ozer, 2007).

In applying Ozer's (2007) model to my study I was able to consider the reciprocal nature of school-based vegetable gardens and understand how changes in the various systems

may constantly influence the successful or unsuccessful implementation of such gardens. I considered both the proximal and distal effects of involving different groups of role-players in school-based vegetable gardens and how these effects could influence the overall sustainability of a garden (Ozer, 2007). Due to the complexity of establishing and managing a school-based vegetable garden, I considered both short-term and long-term effects in formulating my understanding of which role-players might positively contribute to the overall sustainability of such vegetable gardens.

2.6 CONCLUSION

In this chapter I discussed existing literature on the current health and food-related status of South African resource-constrained communities, more specifically focusing on the challenges that resource-constrained communities generally face and possible ways of addressing these, among others, through school-based vegetable garden initiatives. I also explored potential role-players that might be involved in school-based vegetable gardens. In the last section of the chapter I explained my selected theoretical framework.

In the next chapter I explain the research methodology I employed. I discuss the selected epistemological paradigm and methodological approach as well as the research design. I also explained in detail how I went about to generate, document and analyse data.

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CHAPTER 3
RESEARCH DESIGN AND METHODOLOGY

3.1 INTRODUCTION

In Chapter 2 I reviewed existing literature on maximising healthy development. For this purpose I discussed South Africa's current health and food-related status, the importance of addressing challenges in resource-constrained communities, through e.g. school-based vegetable gardens. I concluded the chapter by explaining Ozer's (2007) model of potential effects of school gardens as theoretical framework of my study.

In this chapter I discuss and justify the research design and methodology I utilised. I explain my selected paradigmatic perspectives, research design, and selection of cases and participants. I also discuss the data generation and documentation strategies I utilised as well as the data analysis and interpretation procedures I followed.

3.2 PARADIGMATIC PERSPECTIVES

Research paradigms refer to a general set of philosophical assumptions that may guide researchers in making design decisions and justifying these (Maxwell, 2013). In this section, I discuss the paradigmatic choices I made.

3.2.1 EPISTEMOLOGICAL PARADIGM

I relied on interpretivism as meta-theoretical paradigm, thus acknowledging that multiple realities exist and that reality is socially constructed (Morgan & Sklar, 2012). The interpretivist paradigm accepts various explanations for an individual's actions, thereby implying that meaning is constructed as individuals engage in social interactions and with their surrounding contexts (Creswell, 2014; Mukherji & Albon, 2010). Furthermore, interpretivism argues that individuals continually make sense of the phenomena they experience within their specific "cultural framework of socially constructed and shared meanings" and that individuals' interpretations of the world will influence their place in it (Mukherji & Albon, 2010, p. 23).

Interpretivism focuses on gaining in-depth and detailed insight into a phenomenon rather than producing generalisable findings (Mukherji & Albon, 2010). Research from an interpretivist paradigm therefore generally focuses on the experiences of small numbers of participants and an in-depth analysis of their perceptions and behaviours (Basit, 2010).

As a result, researchers following an interpretivist paradigm often seek to comprehend the setting or context of their participants by visiting their unique contexts and personally generating data in collaboration with the participants (Creswell, 2014). To this end, I focused on providing clarity in terms of a specific studied phenomenon (Nieuwenhuis, 2016b) rather than obtaining generalisable results.

When undertaking an interpretivist study, the questions asked are mostly general and broad, so that participants can construct their own meaning in the specific situation by explaining what they say and do in their real-life settings. Researchers can then interpret these, with the interpretation being shaped by their own opinions and experiences. In order to guard against any bias that my personal, cultural and historical experiences may have generated during the interpretation process, I included member checking, where I took the identified themes back to the participants for them to review the generated information and confirm the accuracy of my results (Creswell, 2014).

In utilising the interpretivist paradigm I was thus able to gain insight into how the participants constructed knowledge and perceived things by entering their worlds and observing this as an insider obtaining a view of their direct experiences (Creswell, 2014; Nieuwenhuis, 2016b). As such interpretivism allowed me to explore the perceptions of teachers with regard to the involvement of various groups of role-players in the establishment and maintenance of school-based vegetable gardens. By selecting participants from a small population group, I was furthermore able to generate data rich in detail (Basit, 2010). I respected multiple subjectively constructed realities and interpreted social reality as it was constructed by the participants (Basit, 2010).

As any researcher and the social world continuously interact and have an impact on each other (Snape & Spencer, 2003) interpretivism implies the potential challenge of a researcher being influenced by the surrounding world. As a result I attempted to remain focused on the objectives of my study, acknowledging that my viewpoint may have differed from that of the participants, and focusing on remaining unbiased when attempting to explain the perspectives and experiences of the teachers who participated. I respected the unique differences between the various participants and attempted to gain insight into the subjective meaning individuals attached to the specific phenomenon (Mack, 2010). As research within the interpretivist paradigm is rigorous and may be time-consuming, I furthermore conducted the study over a period of eighteen months, constantly remaining aware of the time frame I set for myself and trying to work accordingly (Mukherji & Albon, 2010).

3.2.2 METHODOLOGICAL APPROACH

Qualitative research, as described by Creswell (2014), is an approach used to explore and understand the meaning that individuals attribute to various social and human phenomena. Qualitative researchers utilise an array of interconnected interpretive practices, which enable them to gain a better understanding of the phenomena under study (Denzin & Lincoln, 2011). The process of qualitative research generally involves emergent procedures and questions, data that are typically generated within the participants' real-world contexts, inductive data analysis, and the researcher interpreting the meaning of the data (Creswell, 2014). As qualitative researcher, I focused on developing an understanding of the meaning that the participants attributed to the studied phenomenon and not the meaning that I may have constructed (Creswell, 2014). Throughout, I regarded myself − the researcher − as key instrument in the data generation, documentation and analysis processes, albeit in close collaboration with the participants as I also relied on PRA principles (Creswell, 2014).

According to Denzin and Lincoln (2011), qualitative research characteristically uses multiple methods (crystallisation) to allow the researcher to develop an in-depth and descriptive understanding of the phenomenon under study (Denzin & Lincoln, 2011; Ellingson, 2009, 2011). Multiple data sources were generated in my study, including PRA-posters (matrices), semi-structured interviews, audio-recordings, photographs, a reflective journal and field notes (Creswell, 2014; Ellingson, 2009, 2011). By utilising a range of methods, perspectives, practices and empirical materials, I attempted to add richness, rigour, quality and depth to my study (Denzin & Lincoln, 2011; Ellingson, 2009) and gain a comprehensive understanding of the teachers' perceptions.

Qualitative research therefore allowed me to acknowledge the subjective views of the participants and describe their social reality as perceived by them (Basit, 2010). As qualitative research emphasises the diverse meanings that people attribute to their different experiences and actions, I was able to consider the unique opinions and understandings of the participants related to the studied phenomenon. In this manner I could acknowledge the diversity of the participants and their experiences, attitudes, perceptions and viewpoints (Denzin & Lincoln, 2000; Mukherji & Albon, 2010). As qualitative research also acknowledges the role of the self of the researcher as well as how this may impact the outcome of a study or the researcher, I remained cautious and guarded against bias and transferring my constructed knowledge onto the participants (Mukherji & Albon, 2010).

A specific challenge associated with qualitative research thus relates to the interactive relationship between the participants and the researcher (Nieuwenhuis, 2016b), which may result in difficulty to remain objective. As closely related knowledge, patterns and themes should emerge from within the context of a studied phenomenon rather than the researcher's point of view, I guarded against being prejudiced or biased, based on my own previously constructed perceptions. I thus continuously aimed to focus on how the participants made meaning, and remained open to new interpretations and explanations of knowledge (Nieuwenhuis, 2016b). I also employed the strategy of reflexivity, in acknowledging myself as researcher and how this may have influenced the research process as well as how my study may have influenced me (Mukherji & Albon, 2010).

To this end I kept a reflective journal on my progress and experiences of the research process as well as how these may have affected my thought processes and perceptions. I engaged in regular discussions with my supervisor to discuss my thoughts as I progressed (Creswell, 2016). I furthermore relied on member checking, thereby actively involving the participants in confirming my interpretation of the data, in support of trustworthiness (Birt, Scott, Cavers, Campbell, & Walter, 2016).

Finally, qualitative research, as in the case of interpretivism, does not lead to generalisable findings (Denzin & Lincoln, 2011; Nieuwenhuis, 2016b), as the specificity of a qualitative study suggests that it is embedded in the specific political, social, cultural and economic experiences of the participants (Nieuwenhuis, 2016b). As such, findings cannot be generalised to other contexts that may differ in social, cultural and economic settings. As the aim of my study was not to produce generalisable findings, but rather to obtain an in-depth understanding of a specific group of teachers' perceptions within their unique contexts, I do not view this as a limitation in the context of my study.

3.3 RESEARCH METHODOLOGY

Creswell (2016) relates research methodology to the research process underlying a study. In this section I discuss my selected research methodology in terms of the various research components.

3.3.1 RESEARCH DESIGN

I utilised a case study design, applying PRA principles. Yin (1992, 2009) defines a study following a case study design as an empirical inquiry that investigates a phenomenon in its real-life setting, where the boundaries between the context and phenomenon are not clearly set. Case study research thus entails the comprehensive exploration of a

phenomenon from multiple perspectives yet takes into consideration the uniqueness and complexity of the specific system in its context (Schwandt & Gates, 2018). Consequently, this can render a multifaceted, in-depth understanding of a complex issue in its context (Schwandt & Gates, 2018). In undertaking such a study, the application of PRA principles can encourage participation by local stakeholders in real-world problem solving, thereby adding to the understanding of a phenomenon (Lawson, 2015b). Detailed understanding of a case can in this way result in new and updated knowledge about real-world behaviour and individual meanings (Nieuwenhuis, 2016c).

For my study I utilised an exploratory multiple case study design (Nieuwenhuis, 2016c). Moreover, this study was fundamentally exploratory in nature as my purpose was to gain insight into primary school teachers' experiences on a specific phenomenon in their specific contexts. Exploratory case studies explore the context in which a phenomenon occurs where there are no clear outcomes (Nieuwenhuis, 2016c). A multiple case study design furthermore implies the selection of several cases to gain an in-depth understanding of such a specific phenomenon (Creswell, 2016).

PRA principles are often applied when aiming to develop knowledge of and clarity about a specific phenomenon, as PRA is also applied in a naturally occurring, real-world setting, involving people on ground level who have experience and insider views on what is explored (Lawson, 2015a). PRA typically focuses on exploring local knowledge in local contexts that may result in locally relevant solutions to problems. As such, PRA methodology allows researchers to explore local problems and contexts while safeguarding against the marginalisation, domination and oppression of the involved participants (Chambers, 2015; Lawson, 2015a).

Local people are considered to be the main stakeholders when applying PRA principles in research. Participants typically work in small groups to create maps and diagrams while discussing a phenomenon (Chambers, 2002, 2015). PRA is participatory in nature, with the active involvement of participants being paramount to success (Ebersöhn et al., 2011). I decided to apply PRA principles while implementing a case study design as this decision enabled me, as researcher, to interact with the participants while developing an understanding of the studied phenomenon, with the additional possibility of empowering participants in the process of generating increased knowledge and skills (Brighton & Moon, 2007; Mouton, 2001). As such, by utilising a case study design applying PRA principles I was able to gain a multifaceted understanding of the teachers' experiences regarding the involvement of various role-players in school-based vegetable gardens (Schwandt & Gates, 2018). In addition, participants may have given empowered during

the research process as their understanding of the phenomenon and potential solutions to challenges increased when engaging and interacting with peers who share similar experiences (Ferreira & Ebersöhn, 2012).

An advantage of utilising a case study design applying PRA principles relates to the possibility of being able to immerse myself as researcher in the activities and discussions of the participants, and obtain a first-hand account of their perceptions (Chambati, 2015; De Vos, Strydom, Fouché, & Delport, 2011). Furthermore, this design choice allowed for close collaboration of the participants and the research team, as participants were regarded as co-researchers in the research process (Bergold & Thomas, 2012; Nieuwenhuis, 2016c). In this way the potential challenge of power differences could be limited. In addition, information generated during PRA-based activities is generally considered as fairly accurate, being based on the knowledge and experiences of the participants, and generated during interactive activities.

According to Yin (2009), a potential challenge of a case study design, applying PRA principles, relates to the possibility of obtaining findings which lack credibility. In an attempt to address this challenge, I documented each step of the research process in detail, making thorough field notes and keeping a reflective journal (Mukherji & Albon, 2010). In terms of the findings of case study and PRA-based research typically not being viewed as generalisable (Mouton, 2001; Yin, 2009), the context and focus of my study as well as the paradigmatic and methodological choices I made did not ask for generalisable findings. Transferability may, however, be possible, based on my detailed descriptions and continuous reflections on the progress of the study (Maree & Hansen, 2011), yet the decision to transfer the findings to similar contexts lies with the reader.

Chambers (2015) states that another potential challenge of PRA-based methods relates to researchers misusing such methods merely to extract information from participants instead of also empowering them. I guarded against this potential limitation by utilising the strategy of member checking, where I presented my preliminary results to the participants to confirm whether or not my analysis and interpretation of the data was accurate (Creswell, 2014). In addition, I allowed enough time for discussions, during which participants could potentially learn from each other, thereby gaining knowledge and skills to apply in their own contexts.

3.3.2 SELECTION OF CASES AND RESEARCH PARTICIPANTS

I utilised convenience sampling to select the participating schools. Convenience sampling occurs when cases or participants are easily accessible and readily available to the

researcher (Basit, 2010). As my study forms part of three broader ongoing projects, I conveniently involved all nine schools that have been participating in the FIRST-GATE project since 2015. After selecting the schools, I purposefully selected 36 primary school teachers who have been involved in the establishment and maintenance of school-based vegetable gardens at the respective schools. All 36 participants took part in the PRA-based workshop (May 2018), while five of them were also involved in follow-up semi-structured interviews (September 2018).

Purposive sampling occurs when participants are selected with a specific purpose in mind, according to a set of criteria or due to their ability to inform the phenomenon under study (Maree & Pietersen, 2016; Neuman, 2014). Purposive sampling is especially useful when selecting participants according to predetermined criteria that can be related to the research questions (Du Plooy-Cilliers, Davis, & Bezuidenhout, 2014; Neuman, 2014). In the case of my study the following selection criteria applied:

- Participants had to be primary school teachers who had been involved in school-based vegetable gardens.
- Participants had to have been part of the STAR, SHEBA and/or FIRST-GATE projects in the Eastern Cape over recent years.
- Participants had to provide informed consent.
- Participants had to be able to communicate in English.
- Participants had to be available after school hours for data generation sessions.

An advantage of purposive sampling relates to the possibility of selecting participants who are well-informed and can assist a researcher to address the purpose of a study (Mukherji & Albon, 2010; Neuman, 2014). By conveniently selecting the cases I could furthermore benefit from this choice being inexpensive, allowing me to select cases that are easily accessible and quick to obtain (Neuman, 2014).

A challenge of both convenience and purposive sampling relates to the limited possibility of the cases and participants being representative of the population (Neuman, 2014). Due to the interpretivist paradigm and qualitative approach I selected, the aim of my study was not to obtain generalisable findings but rather to gain insight into a specific group of participants' experiences and perceptions (Mack, 2010; Nieuwenhuis, 2016b). In addition, in purposive sampling the competence of participants as well as their potential biases may pose challenges (Tongco, 2007). I attempted to address these challenges by selecting participants who probably possessed the necessary knowledge and skills to understand the studied phenomenon, and by constantly remaining alert of potential biases (Neuman, 2014).

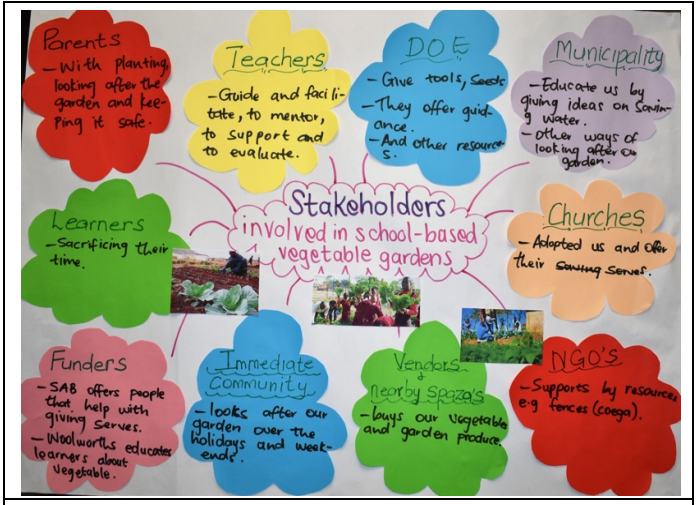
3.3.3 DATA GENERATION AND DOCUMENTATION

As qualitative researcher I relied on multiple data generation and documentation strategies (Paulus, Lester, & Dempster, 2014). I generated data during two field visits, firstly during a two-hour PRA-based workshop (28 May 2018), and secondly by means of five semi-structured interviews which were conducted at five of the nine participating schools (18 September 2018). Furthermore, I used observation-as-context-of-interaction, field notes, a reflective journal, and audio and visual strategies, which allowed for crystallisation and an in-depth understanding of the phenomenon I set out to explore (Maree, 2016b). Lastly, in order to verify the findings of the study with the participants I included member checking, which was done *via* WhatsApp messages (mobile technology) with the participants, in April 2019.

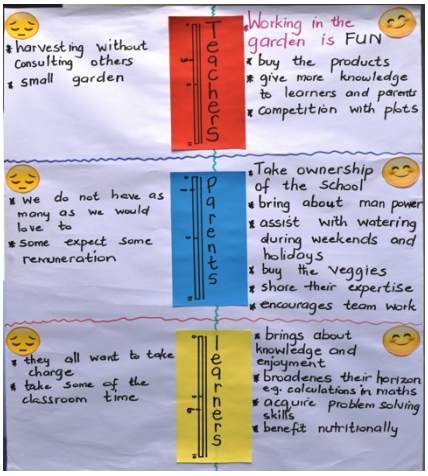
3.3.3.1 PRA-based workshops

According to Kindon, Pain, and Kesby (2007), a participatory approach implies the formation of a collaborative alliance between the researcher and participants when investigating a challenging situation with the aim of improving it. According to Ferreira (2006), workshops may provide an opportunity to implement participatory-related principles that will in turn emphasise the significance of the involvement of participants in devising the objectives and outcomes of a data generation process. PRA-based workshops and activities typically encourage participants to reflect on their own experiences, learn during the process and be encouraged to facilitate change in their specific contexts (Chambers, 2004, 2015; Kindon et al., 2007).

I co-facilitated with fellow MEd student Lauren Jordaan one PRA-based workshop of two hours on 28 May 2018, at a central meeting place (primary school) with the 36 primary school teachers from the nine participating schools. The PRA-based workshop took the form of writing and drawing activities where participants completed PRA-posters in small groups (of four to eight members), and then shared these ideas with the larger group. Participants were grouped according to their schools. Each group completed two posters dealing with the topics of (i) potential role-players that can be involved in school-based vegetable gardens, and (ii) benefits and potential challenges that can be related to the various groups of role-players. The two PRA-posters (matrices) are captured in Photographs 3.1 and 3.2.



Photograph 3.1: PRA-poster on the stakeholders involved in school-based vegetable gardens (28/5/18, School A)



Photograph 3.2: PRA-poster on the benefits and challenges of involving different role-players (28/5/18, School B)

Throughout the discussions, research team members used prompts to guide the teachers in their small groups. I remained aware of the importance of being flexible, as the application of PRA principles does not involve a simple linear process (Chambers, 1994, 2015). Photographs 3.3 and 3.4 capture some of the group discussions and documentation of ideas and perceptions.

Photograph 3.3: Participants during the PRA-based workshop discussing their experiences of school-based vegetable gardens (28/5/18)

Photograph 3.4: Participants compiling PRA-posters (matrices) during the PRA-based workshop (28/5/18)

Member checking refers to the strategy of determining the accuracy of the results by presenting these to participants and providing them with the opportunity to comment (Creswell, 2014). I conducted member checking by creating a WhatsApp group (mobile technology) that included participants from all nine schools as well as my fellow researcher and supervisor as members. I communicated the themes and sub-themes I had identified to the participants in the form of messages on the group and requested the participants to provide feedback on the accuracy of my interpretations, adding or adjusting the themes and sub-themes as they see fit. Whereas most of the participants merely

confirmed my analysis, some added insightful data that further enriched my understanding of their experiences of involving role-players in their vegetable gardens.

3.3.3.2 Semi-structured interviews

Qualitative interviews typically entail a few open-ended and unstructured questions, which are intended to elicit the opinions and views of the participants (Creswell, 2014; Nieuwenhuis, 2016c). More specifically, during semi-structured interviews, participants are commonly asked a few open-ended questions and if necessary, some follow-up questions for clarification through the use of probing (Creswell, 2014). Interviews generally provide rich descriptive data that may support a researcher to understand how participants construct knowledge and experience social reality (Nieuwenhuis, 2016c).

The aim of the current study was to explore teachers' experiences regarding the involvement of various role-players in school-based vegetable gardens. I co-facilitated (with fellow research team members) five semi-structured interviews with five participants at five of the participating schools in order to obtain a detailed account of this phenomenon (Creswell, 2014; Nieuwenhuis, 2016c). The interviews lasted between 15 and 30 minutes each and were conducted on 18 September 2018 at the various schools, during the second field visit I undertook. The interviewees included one school principal, one deputy principal and three teachers who were involved in their school-based vegetable gardens. Following completion of the interviews, these were transcribed verbatim for the purpose of data analysis (consult Appendix B).

Interviews are useful when participants cannot be observed on a continuous basis. Interviews provide participants with the opportunity to offer background information, and can encourage open communication between the researcher and participants (Creswell, 2016). Interviews can provide researchers with some control during the line of questioning, as they can request elaboration. To this end, interviews are a cost-effective and time efficient method of qualitative data generation (Creswell, 2016).

However, a potential challenge associated with semi-structured interviews relates to researchers becoming side-tracked when questioning the participants (Creswell, 2016). I guarded against this by constantly steering the participants back to the focus of the interview. I asked open-ended questions aligned with the overall research questions and encouraged the participants to share their experiences with me openly (Nieuwenhuis, 2016c). Another potential challenge that is associated with interviews relates to indirect information being filtered through the subjective views of interviewees (Creswell, 2016). In addition, not all interviewees may be equally perceptive and articulate (Creswell, 2016).

As the participants whom I interviewed were all involved in the said broader research projects, they shared their experiences openly and clarified any uncertainties, therefore I did not experience these challenges.

3.3.3.3 Observation-as-context-of-interaction

Observation can be considered as a systematic data generation process that relies on the ability of a researcher to obtain data through the use of senses (seeing, hearing, touching, smelling and tasting) without verbal communication with the participants (Seabi, 2012). During qualitative observation researchers generally compile field notes on the activities and behaviour of the participants as well as the physical settings in which these activities occur (Angrosino & Mays de Pérez, 2000; Creswell, 2014).

Observation-as-context-of-interaction is described by Angrosino and Mays de Pérez (2000) as the process of developing a membership role in the context of a study so that participants' behaviour and interactions can be observed. In employing observation-as-context-of-interaction I attempted to take on a membership role. For this purpose I aimed to observe the participants without influencing them. I documented my observations in the form of field notes and by taking photographs during the PRA-based workshop and individual interviews (Angrosino & Mays de Pérez, 2000).

A potential challenge associated with observation relates to possible bias by the researcher. As researchers may enter the participants' natural settings with preconceived ideas and assumptions about the phenomenon under study, participants may be affected and respond to the researcher and the cues provided (Angrosino & Mays de Pérez, 2000). I guarded against these potential challenges by relying on reflexivity and aiming to be a self-conscious researcher who reflected on my personal input to the study. I remained cautious of how my personal biases might have affected the research, and by challenging any preconceived assumptions I might have had when entering the research field (Angrosino & Mays de Pérez, 2000; Creswell, 2016).

3.3.3.4 Field notes

Creswell (2016) defines field notes as an accurate record of the researcher's observations. Qualitative researchers typically record comprehensive descriptive details of the participants' behaviour, the research site, events, as well as their reflections on patterns, data and the research process (Brodsky, 2012). Field notes are usually written in the first person, are unique to the researcher and compiled in a spontaneous, free

flowing manner. It is recommended that field notes be written soon after field visits and in as much detail as possible (Brodsky, 2012).

During the PRA-based workshop and semi-structured interviews my co-researcher and I both compiled descriptive and reflective field notes (consult Appendix C). Sharing our field notes allowed us to obtain more than one perspective on the phenomenon under study, enabling crystallisation and supporting us in gaining a deep understanding of the respective phenomena we focused on (Maree, 2016b). By compiling detailed field notes we were able to obtain an understanding of how individuals themselves experienced and characterised certain activities, behaviours and events (Silverman, 2017). Moreover, detailed field notes enabled us to communicate the participants' experiences and explanations for specific events, thereby eliciting the participants' theories and understanding of the phenomena we explored (Silverman, 2017).

Potential challenges associated with field notes are their possible subjective nature as well as the difficulty of holistically documenting what is happening and not only what the researcher deems important (Silverman, 2013, 2017). I continuously reflected in my reflective journal to guard against these challenges, indicating the participants' interactions and the meaning I attributed to these. Furthermore, field notes that are captured following a delayed period of time may pose a challenge to the trustworthiness of generated data (Flick, 2009). In order to avoid this challenge, I compiled my field notes during and within hours after data generation activities, thereby capturing accurate and detailed notes.

3.3.3.5 Reflective journal

Flick (2009) describes a reflective journal as a diary that may contain a researcher's ideas, fears, experiences, breakthroughs, confusions and any complications that may arise during a study. Vannini (2012) similarly regards a reflective journal as a document compiled by the researcher to record ongoing events in the research process as well as in the surrounding social context. A reflective journal captures the processes of a study, the experiences of the researcher, as well as any experienced difficulties (Flick, 2009). For a reflective journal to contribute to the value of a study, it needs to be updated regularly, and to be personal and contemporaneous (Vannini, 2012).

By compiling a reflective journal (consult Appendix D), I was thus able to reflect on the research process, which in turn allowed me to document my personal journey throughout the study (Vannini, 2012). I was able to document and explore my ideas, experiences and

doubts, and could refer to past entries, review my earlier assumptions, and reflect on any modifications in my thinking when required (Creswell, 2016).

An advantage of keeping a reflective journal when doing qualitative research relates to this strategy being flexible and suitable to use for multiple research designs and strategies as well as data sources (Vannini, 2012). According to Ortlipp (2008), a reflective journal can be considered a time-consuming strategy that may distract researchers from focusing on active involvement in the study. I guarded against this challenge by allocating specific times for compiling my reflective notes in order to keep my reflections updated after each field visit.

3.3.3.6 Audio and visual data generation and documentation strategies

According to Creswell (2014) qualitative audio and visual data generation and documentation strategies include recordings, videotapes, films and photographs. I included audio and visual data by collecting visual data (consult Appendix E) in the form of PRA-matrices and photographs, and audio data by using a voice recorder to record the participants' responses during the semi-structured interviews as well as during feedback sessions at the PRA-based workshop. I later transcribed these interviews verbatim for data analysis purposes (Creswell, 2016; Neuman, 2014; Silverman, 2017).

The audio and visual data I relied on was supported by my observation, field notes and reflective journal. In addition to photographs being taken of the participants during the PRA-based workshop, photographs were taken of the PRA-posters (matrices) created during the workshops for the purpose of analysing these at a later stage. Advantages of audio and visual strategies relate to these strategies generally being unobtrusive to participants on condition that they are comfortable with such strategies. In addition, these strategies can provide participants with an opportunity to share their reality directly with the researcher (Creswell, 2016).

Challenges associated with visual data generation and documentation methods include that the presence of someone taking photographs may affect participants' responses (Creswell, 2016). I guarded against this by explaining to the participants beforehand that I would be taking photographs, and giving them a choice of being photographed or not. I also attempted to be inconspicuous and unobtrusive when taking the photographs (Creswell, 2016). Other challenges sometimes associated with audio data generation relate to participants not being willing to be audio-recorded, or equipment-related challenges such as a device failing to record (Bell, 2010). I did not encounter any of these challenges as all of the involved participants agreed to be recorded and photographed,

and the device not failing to record. This may be ascribed to the participants' involvement in the broader research projects in recent years, and being used to these techniques utilised during data generation sessions. I also tested the recording device beforehand to ensure that it was in good working condition.

3.3.4 DATA ANALYSIS AND INTERPRETATION

I conducted inductive thematic analysis of all data sources (consult Appendix F), which enabled me to provide a detailed and rich account of the data (Braun & Clarke, 2006; Silverman, 2014). Inductive thematic analysis additionally allowed me to extract meaning and concepts from the generated data and to identify, examine and record emerging themes and patterns (Creswell, 2016; Javadi & Zarea, 2016).

In conducting my analysis, I followed Braun and Clarke's (2006) six phases of thematic analysis. These guidelines include becoming familiar with one's data, constructing initial codes, investigating emerging themes, reviewing emergent themes, naming and defining themes, and then compiling a report (Braun & Clarke, 2006). In accordance with these guidelines, I began the data analysis process by reviewing all the generated data sources several times to obtain an overview of the data (Creswell, 2016). I specifically reviewed my field notes, the PRA-posters (matrices), audio and visual data, transcripts and my reflective journal.

Thereafter, I manually coded the generated data according to initially identified patterns that emerged through my examination of the data (Creswell, 2016; Javadi & Zarea, 2016; Saldaña, 2016). I organised the data into broad categories of information and assigned an initial code to each group. I analysed the data by hand, colour-coding the various categories and combining similar codes to form overarching themes and sub-themes that could provide evidence in addressing my research questions (Creswell, 2016; Javadi & Zarea, 2016). I remained flexible and allowed themes to emerge while referring to previous phases of the data analysis process in reviewing and refining the initially identified themes and sub-themes at a later stage (Saldaña, 2016).

Once I had established preliminary themes and sub-themes, I reviewed them to ensure their relevance to the research questions and to determine whether or not they formed a consistent pattern. Next, I defined and named each theme, describing the essence of the theme as well as the aspects covered by each theme (Javadi & Zarea, 2016). Finally, I compiled this research report, after organising the themes into a sequence that could provide answers to my research questions (Creswell, 2016). Throughout the data analysis process I discussed the identified themes and sub-themes with my supervisor, and

reflected on the process of analysis, as well as my thoughts and decisions in my reflective journal. I frequently reviewed the generated data from various perspectives in an attempt to add to the trustworthiness of the findings (Braun & Clarke, 2006; Silverman, 2017; Vaismoradi, Turunen, & Bondas, 2013).

According to Braun and Clarke (2006), inductive thematic analysis is suitable when applying participatory research principles, as participants become collaborators in such studies. Another advantage relates to inductive thematic analysis being appreciated when summarising key features in a large pool of data, which may in turn offer a comprehensive and rich description of the data (Braun & Clarke, 2006). By utilising this strategy I was able to identify key features in the data that related to my research questions. In addition, I could highlight differences and similarities in the data set that might yield unanticipated insights or patterns in the data (Braun & Clarke, 2006).

A possible challenge often associated with inductive thematic analysis relates to researchers being influenced by bias when conducting their analysis (Javadi & Zarea, 2016). To guard against this, I remained aware of my opinions and experiences, staying open to the information that the data yielded. I also reflected and engaged in regular discussions with my supervisor. Another challenge relates to the possibility of conducting a weak analysis with little distinction between themes, resulting in limited internal consistency (Braun & Clarke, 2006). To this end I ensured clear definitions of each theme, making sure that these provided detailed descriptions of each aspect of the data. Additionally, I discussed my data analysis with my supervisor to gain a different view on the initial codes and emergent themes and sub-themes I had identified (Creswell, 2016).

3.4 CONCLUSION

In this chapter I described the research process and related methodological choices I made. For this purpose, I explained my selected paradigms, research design and data generation, documentation and analysis procedures

In Chapter 4 I present the results of my study, in terms of the themes and related sub-themes I identified during inductive thematic analysis. I then interpret these against the background of the existing literature presented in Chapter 2 thereby presenting the findings of my study.

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CHAPTER 4
RESULTS AND FINDINGS OF THE STUDY

4.1 INTRODUCTION

In Chapter 3, I explained the research design and methodological process followed in the current study. To this end, I described the interpretivist paradigm and qualitative approach I utilised, how I selected the cases and participants, and which data generation, documentation and analysis strategies I employed.

In this chapter I present the results of my study in terms of the identified themes and sub-themes. I include photographs, participants' verbatim utterances and excerpts from the data to support my discussion. I subsequently present the findings of the study by relating these themes and sub-themes to existing literature, indicating similarities and contradictions.

4.2 RESULTS OF THE STUDY

Figure 4.1 serves as an introduction to this section, as an overview of the results.

Figure 4.1: Overview of themes and related sub-themes of the study

4.2.1 THEME 1: POTENTIAL ROLE-PLAYERS AND THEIR RESPONSIBILITIES

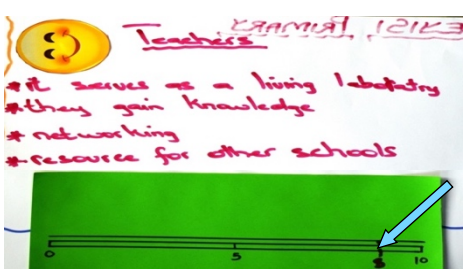
This theme, with three related sub-themes, captures teachers' experiences of involving various role-players in school-based vegetable gardens, with their related responsibilities. Table G-1 in Appendix G provides an overview of the inclusion and exclusion criteria I relied on in identifying the relevant sub-themes.

4.2.1.1 Sub-theme 1.1: School-based staff members

Participants from all nine schools agreed that teachers fulfil an important role in school-based vegetable gardens; however, the level at which teachers are typically involved varies from school to school. In this regard, a participant from School G, for example, stipulated, "*The role-players are the teachers*" (I5, S-G, P5).[6] In support, a participant from School E commented that teachers play "*a very primary role, a very central role*" (I1, S-E, P1). Following the interviews at the various schools, I reflected on the participation of teachers in school-based vegetable gardens in the following way: "*At each school at least several school teachers were involved in the running of the vegetable garden. Some schools had several teachers involved while other schools had only one teacher as the primary organiser and supervisor*" (RJ, 19 September 2018).

Participants from Schools F, G and H indicated that out of all the role-players that were involved in their vegetable gardens 40% were teachers (PRA-M13, S-F; PRA-M15, S-G; PRA-M18, S-H). Participants from School C indicated higher involvement with 80% of role-players being teachers (PRA-M6, S-C). This trend was supported by participants from School I (PRA-M20, S-I) who also indicated that the teachers in their school made an 80% contribution to the vegetable garden. Photographs 4.1 and 4.2 illustrate how participants stipulated the involvement of teachers in their vegetable gardens.

Photograph 4.1: Involvement of teachers in School C's vegetable garden



Photograph 4.2: Involvement of teachers in School I's vegetable garden

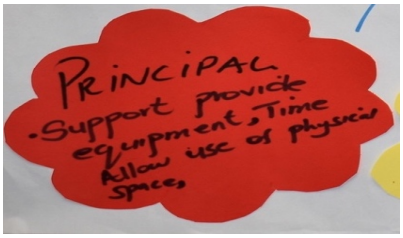
[6] Henceforth, the following abbreviations apply: PRA-M = Matrix made during the PRA-based workshop on 28 May 2018, followed by the number of the poster (PRA-matrix); I = Interview conducted on 18 September 2018, followed by the number of the interview; S = School; P = Participant; FN = Field notes; RJ = Reflective journal. Responses are given verbatim and have not been edited.

Participants from School I elaborated by explaining that the teachers involved in their garden formed part of a nutrition committee specifically established for the garden project. During the interviews, a participant said, *"I've got a committee, because here at the school, everything we work in committees"* (I4, S-I, P4). In support, a participant from School H stated, *"We have a committee for the nutrition … we've incorporated that aspect [the garden] in the nutrition committee"* (I2, S-H, P2). On the contrary, participants from School E reported that their nutrition committee members were not involved in the maintenance of their garden. During the interview at School E, the participant said: *"… involved in the garden and the committee, nobody"* (I1, S-E, P1).

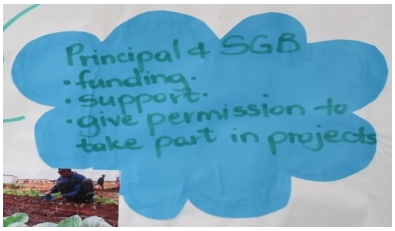
Participants from School E voiced the belief that, in the establishment and maintenance of school-based vegetable gardens, teachers could be *"co-ordinators of the whole process they inter-link to principal, learners, community"* (PRA-M10, S-E). Participants from three of the schools indicated that teachers fulfilled the role of facilitators by providing guidance, mentorship and support in the gardens, while simultaneously assuming the responsibility of teaching and creating learning opportunities for learners (PRA-M3, S-C; PRA-M4, S-D). In confirmation of this contribution, I commented as follows in my reflective journal: *"The teachers seem to take on a supervisory role in the maintenance of the gardens"* (RJ, 19 September 2018).

Five of the nine schools were of the opinion that teachers specifically have to be involved in garden initiatives in a supervisory role if learners are to be involved. A participant from School A expressed their view by stating, *"teachers go with the learners to the garden" (*I3, S-A, P3). Participants from School I focused on hands-on activities when describing the role of teachers in the maintenance of vegetable gardens. They referred to *"supervise, planting, harvesting, watering"* and *"selling"* (PRA-M19, S-I).

In addition to teacher involvement, participants indicated that additional school-based staff members such as school principals, gardeners, and caretakers were also involved in the gardens at their schools. In providing more detail, School A reported that "*our principal plays a big role in the garden*" (I3, S-A, P3). In highlighting the importance of the principal as part of the school nutrition committee, School H indicated the following: *"… also if we have committees, I [the school principal] must also be part of the committee to oversee that everything is happening accordingly"* (I2, S-H, P2). Other responsibilities of principals, as perceived and reported by the participants, related to securing funding, providing support, resourcing equipment, providing permission for teachers to take part in garden activities and allowing them to use physical space on the school grounds for their gardens. Photographs 4.3 and 4.4 capture these contributions.



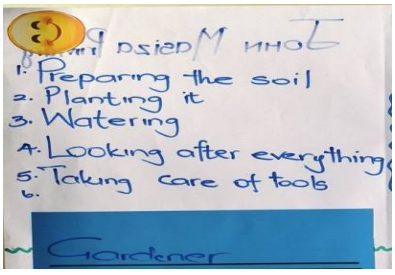
Photograph 4.3: Responsibilities of principals in school-based vegetable gardens (School A)



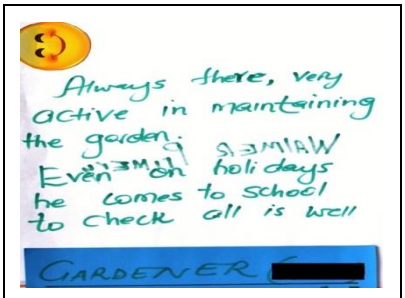
Photograph 4.4: Responsibilities of principals in school-based vegetable gardens (School B)

Participants from School E seemingly believed that school principals have the power to mobilise other teachers and learners to become more involved and build a stronger team, which may in turn promote healthy eating, as reported by their representative during the individual interview. In support, a participant from School H emphasised the importance of the principal to be proactively involved and participate in all garden activities him/herself, as principals are required *"to lead by example"* (I2, S-H, P2). Furthermore, participants noted that principals can take ownership of vegetable gardens and as a result organise and provide support to ensure sustainability. In elaborating on this idea, a participant mentioned that principals can provide support in the form of funding or in the form of advice to staff members when they face challenges. The participant commented that: *"If we need support we go to our principal"* (I3, S-A, P3).

Next, participants from four schools reported that gardeners were involved in their vegetable gardens. A participant from School I pointed out *"… there are two gardeners"* (I4, S-I, P4), while schools E and G indicated the main responsibilities of gardeners to include *"planting"* and *"maintaining the garden daily"*, as captured in Photographs 4.5 and 4.6.



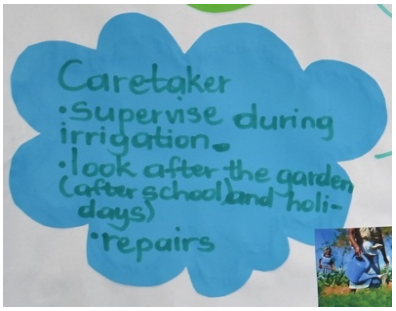
Photograph 4.5: Responsibilities of gardeners at School E



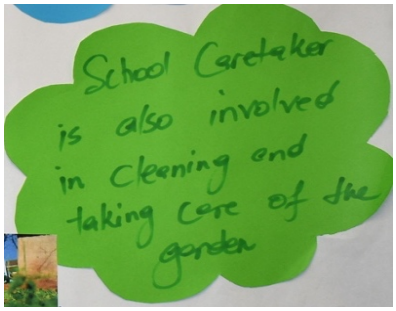
Photograph 4.6: Responsibilities of gardeners at School G

In addition, participants from four of the participating schools referred to a caretaker being involved in the maintenance of their school-based vegetable gardens. They perceived the main responsibilities of caretakers as relating to *"supervise during irrigation, look after the*

garden (after school) and holidays, repairs" and *"… involved in cleaning and taking care of the garden"*. Photographs 4.7 and 4.8 provide supporting evidence to these contributions.



Photograph 4.7: Responsibilities of caretakers at School B



Photograph 4.8: Responsibilities of caretakers at School G

4.2.1.2 Sub-theme 1.2: Learners, parents and community members

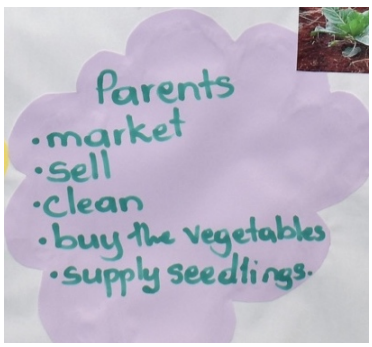
Participants from all nine schools indicated that learners as well as community members were involved in some way or another in their school-based vegetable gardens, while participants from six of the schools reported that parents were involved. This result is captured in the following excerpt from my journal: "*It appears that all nine participating schools have learners and teachers involved in some capacity in their school-based vegetable garden, with learners appearing to be involved the most"* (RJ, 28 May 2018).

The following contributions attest to the involvement of learners:

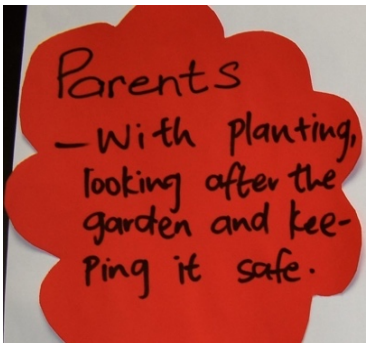
- *"I have my learners helping me a lot, they maintain it, they love going to the garden"* (I1, S-E, P1)
- *"… they* [the learners] *are very involved, but it's voluntary"* (I4, S-I, P4)
- *"… maintenance of the gardens … planting the seedlings … water the garden … harvesting … learn to plant so as to be able to do for themselves"* (I3, S-A, P3).

Even though six of the schools indicated that parents were involved in some way in their school-based vegetable gardens, the other schools indicated limited or a lack of involvement of this group of potential role-players. Participants, for example stated, *"… there are a few parents who are involved"* (I3, S-A, P3) and *"… there is no parents coming to volunteer"* (I1, S-E, P1). For the schools where parents were involved, their responsibilities apparently centred on *"... working during school holidays, preparing the soil"* and *"… planting, weeding and watering the garden"* (PRA-M18, S-H). In support,

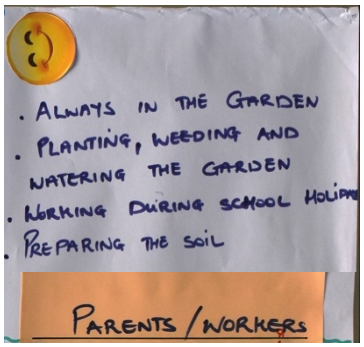
participants indicated that parents were involved in maintenance activities, as captured in Photographs 4.9, 4.10 and 4.11.



Photograph 4.9: Parent involvement in School B's vegetable garden



Photograph 4.10: Parent involvement in School D's vegetable garden



Photograph 4.11: Parent involvement in School H's vegetable garden

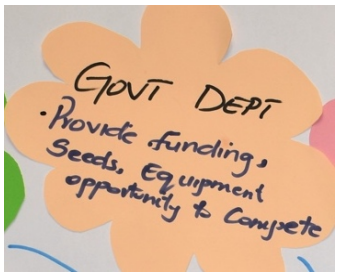
Finally, participants from all nine schools reported that community members were involved in their school-based vegetable gardens to a certain extent. Participants from School A valued this contribution, as captured in their representative's statement that *"the community members, they help us a lot"* (I3, S-A, P3). In support, a participant from School I reported that their gardener was a community member who worked closely with the school to maintain the garden during school holidays and over weekends. In this regard, I commented that teachers *"involved community members as gardeners as they would occasionally tend to their garden and look after their garden on weekends and school holidays"* (FN, 18 September 2018). In addition, during the PRA-based workshop, participants referred to additional community-based role-players that were involved, such as neighbouring schools, vendors and nearby spaza shops, students from the Nelson Mandela University and local churches.

4.2.1.3 Sub-theme 1.3: External stakeholders

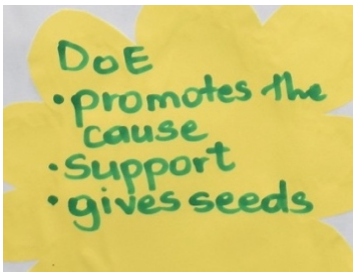
The majority of the participating schools indicated that government-based role-players were also involved in their vegetable gardens. They referred to the Department of Basic Education, the Department of Agriculture, the local municipality, the Department of Rural Development and Agrarian Reform (DRDAR), and the Department of Correctional Services (consult Appendix E for PRA-matrices). According to the participants, the responsibilities of this group of role-players included the provision of *"funding, seeds, equipment, opportunity to complete"*, as captured in Photograph 4.12.

Several schools specifically referred to the involvement of the Department of Basic Education. School B, for example, reported that the DBE assisted them in promoting the

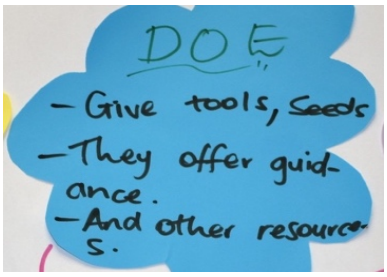
cause of school-based vegetable gardens (Photograph 4.13), while School D referred to guidance and support provided by the DBE (Photograph 4.14). Two of the schools did not mention the DBE as role-player in their vegetable gardens, as they allegedly perceived the DBE not to be contributing or supporting them in this initiative.



Photograph 4.12: Government-based role-players at School A



Photograph 4.13: DBE involvement at School C

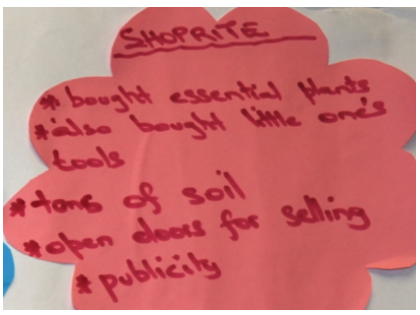


Photograph 4.14: DBE involvement at School D

In addition to government departments, participants from a few schools (A, B, D, E and F) mentioned NGOs as role-players in their gardens. In addition, School I mentioned EduPlant, Calabash, INMED and Masimyusame as role-players, stating that they fulfilled a role in providing water tanks, seedlings, funding and employing gardeners. In addition, participants from four of the schools referred to sponsorships and sponsored role-players supporting them. They mentioned funders, tourists and sponsors such as Builders Warehouse,[7] Tree Master, and the One Life Project, which had been supporting them with seeds, donating trees to the school, and providing funds.

Lastly, participants from Schools F and I referred to supermarket groups supporting them. These role-players reportedly assisted by buying essential tools for the gardens and providing soil. As such, it seems clear that several external stakeholders have been fulfilling a supportive and functional role over the years in the vegetable gardens at the respective schools. Photographs 4.15 and 4.16 capture some of these indications.

Photograph 4.15: NGOs involved at School F



Photograph 4.16: Supermarket involved at School I

[7] South African hardware franchise store.

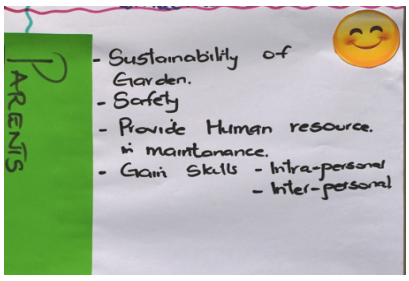
4.2.2 THEME 2: BENEFITS OF INVOLVING VARIOUS ROLE-PLAYERS IN SCHOOL-BASED VEGETABLE GARDENS

Theme 2 relates to teachers' experiences of the benefits related to involving role-players in vegetable gardens. This theme comprises three related sub-themes, of which the inclusion and exclusion criteria are captured in Table G-2 (consult Appendix G).

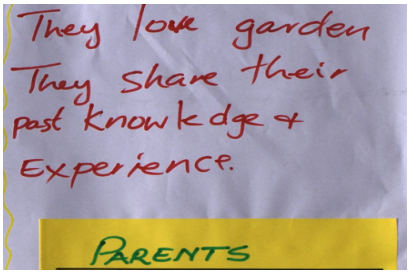
4.2.2.1 Sub-theme 2.1: Knowledge and skills acquisition

Participants shared the view that involvement in school-based vegetable gardens allowed for knowledge and skills acquisition by both learners and parents, with teachers fulfilling a role in the process of knowledge and skills sharing. When discussing the benefits of involving learners, participants from five of the schools shared examples of learners having positive experiences as a result of their involvement. Participants, for example, stated that learners *"… are acquiring skills and knowledge"* (PRA-M13, S-F), gain "*… knowledge on handling seeds and tools*" (PRA-M11, S-E), and are *"… empowered with skills"* (PRA-M6, S-C). Furthermore, participants from School E noted that, by involving learners in their garden, learners were "*being taught how to plant, prepare the soil and watering"* (PRA-M11, S-E).

Similarly, participants shared the view that parents who have been involved in school-based vegetable gardens benefited, for example, by gaining both intrapersonal and interpersonal skills. Photograph 4.17 captures this idea, as indicated by School A, while School D referred to the possibility for parents to "*share their expertise"* (PRA-M9, S-D). In Photograph 4.18 School G indicated the benefit of parents being able to build on their past knowledge and experience.



Photograph 4.17: Benefits of involving parents in vegetable gardens (School A)



Photograph 4.18: Benefits of involving parents in vegetable gardens (School G)

The participants therefore seemingly viewed teachers as instrumental in transferring knowledge and practical skills to learners and parents involved in vegetable gardens. In support of this result, participants from School D stated that teachers "*give more*

knowledge to learners and parents" (PRA-M9, S-D). Another group of participants reflected on the benefits of involving teachers by stating that *teachers "transfer skills to learners"* (PRA-M1, S-A). A participant from School H commented that their caretaker was involved in teaching learners how to plant and water, thereby supplementing the informative function fulfilled by the teachers. In addition, the participant remarked that learners *"learn through play"* while in the garden with the caretaker (I2, S-H, P2).

As such, participants apparently held the view that both learners and parents gained knowledge and practical gardening skills from being involved in school-based vegetable gardens. In this regard the teachers and caretakers were viewed as knowledgeable and in a good position to teach those involved. In addition to the benefits of gaining knowledge and skills, participants held the view that learner involvement in vegetable gardens contributed to their personal development, more specifically in terms of the following, as observed by them:

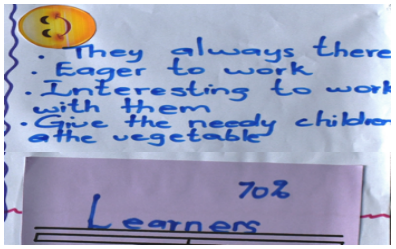
- *"become responsible"* (PRA-M13, S-F)
- *"promote discipline"* (PRA-M6, S-C)
- *"boost self-esteem"* (PRA-M6, S-C).

Participants from School D were furthermore of the opinion that, by being involved in school-based vegetable gardens, learners were able to broaden their horizons, with teachers simultaneously being exposed to different ways of including garden activities in the school curriculum. Participants, for example, referred to teachers acquiring the skill of integrating "*calculations in Maths"* (PRA-M9, S-D). On a broader level, teachers were seen to benefit by having the opportunity to apply garden activities as part of the curriculum, in subjects such as Mathematics, Life Sciences, Technology and Natural Sciences, once again implying advantages for both teachers and learners (PRA-M6, S-C). Even though the participants thus indicated the benefit of vegetable gardens for the personal development of learners, they did not discuss these benefits in depth.

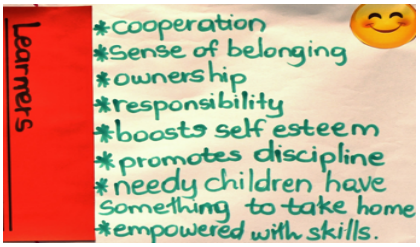
4.2.2.2 Sub-theme 2.2: Access to resources and support

Participants from all nine schools viewed the learners who participated in school-based vegetable gardens as resources that can provide support, and assist in the maintenance of such gardens. In this regard participants from School I commented that in their school-based vegetable garden, learners *"make work easy, e.g. watering, mulching and collecting snails"* (PRA-M20, S-I). Furthermore, a participant from School A mentioned that *"learners involve themselves in planting the seedlings and digging in the soil"* (I3, S-A, P3).

Learners in turn were perceived to have benefitted from school-based vegetable gardens as these provided them with access to food, for learners to *"benefit nutritionally"* (PRA-M9, S-D). Participants from Schools B and C shared this view, as they seemingly believed that their gardens provided food to needy learners, as captured in Photographs 4.19 and 4.20. Additionally, during member checking a participant from School H commented that their vegetable garden supplemented the school nutrition programme and enriched the learners' meals (Member checking, 22 April 2019). In this regard I made the following comment: *"The garden is not only a teaching resource or source of income but also a source of healthy food"* (FN, 18 September 2018).

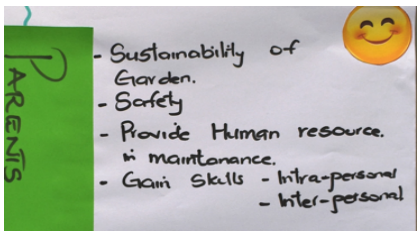


Photograph 4.19: Benefits of involving learners in vegetable gardens (School B)

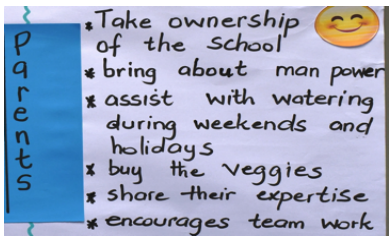


Photograph 4.20: Benefits of involving learners in vegetable gardens (School C)

Participants indicated that parents could be viewed as resources and provide support by serving as *"human resources in maintenance"* (Photograph 4.21), or when establishing school-based vegetable gardens by providing *"man power, planting, weeding and watering the garden, and preparing the soil"* (Photograph 4.22).



Photograph 4.21: Benefits of involving parents in vegetable gardens (School A)



Photograph 4.22: Benefits of involving parents in vegetable gardens (School D)

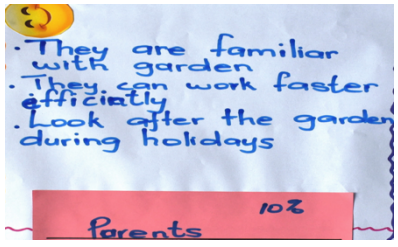
In addition to learners and parents being regarded as sources of support, the participants indicated that teachers provided support and guidance and could therefore be regarded as a source of motivation for other role-players. For example, participants from School E mentioned that teachers *"motivate and provide moral support to learners"* (PRA-M2, S-A). These participants referred to teachers providing *"guidance that is needed"* and *"providing with needed material and anything needed"* (PRA-M11, S-E).

Participants also referred to gardeners as potential role-players to provide support. Gardeners were regarded as valuable resources as they could be *"looking after everything"* and *"taking care of tools"* (PRA-M11, S-E). Finally, the participants mentioned the involvement of community members as potential resource, as *"they are helpful and willing to assist the school"* (PRA-M16, S-G).

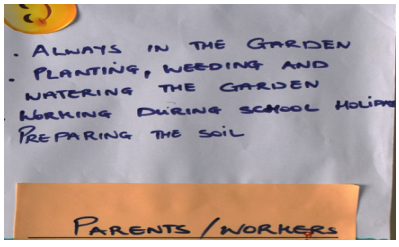
4.2.2.3 Sub-theme 2.3: Positive outcomes in terms of sustainability

Participants held the view that learner involvement in school-based vegetable gardens enabled them to acquire knowledge and skills that can be used to secure a sustainable way of living. A participant from School H explained that learners gained *"skills to take home because some of these children are coming from very poor backgrounds, you know so if they have the skill of producing something they can go home and make their own gardens"* (I2, S-H, P2). Participants from School G supported this view by indicating that learners are *"easily trainable"* as teachers are able *"to instil and reinforce garden skills"* (PRA-M15, S-G). In addition to the participants being of the view that learner involvement in school-based vegetable gardens can contribute to sustainable living, they pointed out that the involvement of various role-players could in turn contribute to the sustainability of the garden initiatives.

Participants from School A, for example, indicated that parents could contribute to the *"sustainability of garden"* (PRA-M2, S-A) by maintaining gardens during school holidays, working fast and efficiently, and buying produce from vegetable gardens. These views are captured in Photographs 4.23 and 4.24.



Photograph 4.23: Benefits of involving parents in vegetable gardens (School B)



Photograph 4.24: Benefits of involving parents in vegetable gardens (School H)

Participants from School G reported a combination of role-players supporting sustainable living on the one hand, and role-player involvement promoting sustainable vegetable gardens on the other. To this end they explained how parents were allowed to have their own plots on the school premises where they were able to maintain their own small gardens, thereby contributing yet also sharing resources with the school. During school holidays the community gardeners involved in School I's garden would tend to the

school's garden, yet in return benefit by sharing in the produce. In this regard, a participant stated, *"We've got two community gardeners … we are sharing"* (I4, S-I, P4). In confirmation of this idea participants from School G explained that their gardener is *"always there, very active in maintaining the garden"* (PRA-M16, S-G).

According to the participants, the sustainability of school-based vegetable gardens is linked to involving teachers and having nutrition committees that oversee the overall running of the garden and *"ensure that the program continues yearly*" (PRA-M2, S-A). As such, sustainability of vegetable gardens is linked to established support systems being in place. A participant from School I added that *"you can't do anything on your own … even if I'm not here they know everything"* (I4, S-I, P4). Furthermore, I noted: "*The teachers involved in the gardens seemed to be involved in a nutrition committee that assumes responsibility for managing the garden and providing multiple teachers who could take over"* (RJ, 19 September 2018).

4.2.3 THEME 3: FACTORS SUPPORTING THE SUCCESS OF SUSTAINABLE SCHOOL-BASED VEGETABLE GARDENS

This theme captures teachers' perceptions of the factors that contribute to the success of sustainable school-based vegetable gardens. Table G-3 (Appendix G) provides an overview of the inclusion and exclusion criteria I relied on in identifying the sub-themes.

4.2.3.1 Sub-theme 3.1: Dedicated person driving the initiative

According to the participants, a dedicated person who would drive the garden initiative was key. Such individuals were viewed as the coordinators of the entire process, providing structure in managing the vegetable garden. As such, this dedicated individual would typically manage all garden activities. In support of this view, a teacher at School H described herself as an example, stating "*I decided that I should ask the sponsors of our school to maybe make us a vegetable garden where the children will be involved in gardening*" (I2, S-H, P2). In confirmation, I noted: "*all the gardens seem to be flourishing due to one person's dream or passion for creating a garden"* (FN, 18 September 2018).

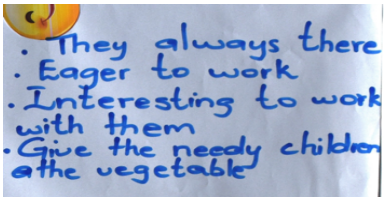
In the case of two of the nine schools, the dedicated individuals were teachers, while three of the school garden projects were driven by principals or deputy principals. In addition to an individual driving a vegetable garden initiative, participants mentioned that support by others was essential to be able to manage a garden successfully, and realise the dreams of the individual who initially planned the project. A participant from School I explained that "*you can fly your wings but if the boss of the school doesn't buy your story*

you can be passionate, you can be gifted, you can have all the resources but it's the school's principal that's the one … you need advice from" (I4, S-I, P4). As such, the participants seemingly held the view that a dedicated driver was required, supported by a principal who shared the dream and would thus support the initiative.

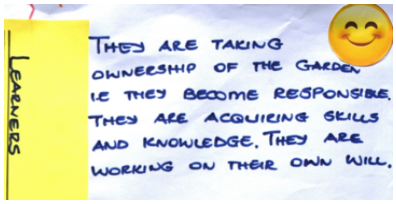
4.2.3.2 Sub-theme 3.2: Commitment and ownership by those involved

Committed individuals who took ownership of school-based garden initiatives were regarded as important resources that would contribute to the success of a garden. These role-players were in a position to instil commitment and enthusiasm for vegetable gardens into others, thereby propagating the sustainability of garden initiatives. As already indicated, several of the schools emphasised the important role of the principal, who was regarded as responsible for encouraging and supporting teachers to become involved in garden initiatives. In this regard, a participant from School G stated that "*she* [school principal] *encourages us all the time to do the garden*" (I5, S-G, P5).

Next, participants shared their experience of learners who were involved in taking ownership, thereby adding to the success of vegetable garden initiatives. In this regard, participants indicated that learners "*are taking ownership of the garden*" (PRA-M13, S-F). As a result, learners seemed eager to work in vegetable gardens at school, resulting in their presence and their being openly committed. Photographs 4.25 and 4.26 provide supportive evidence of this result, which is further captured in the following notes I compiled: "*Learners were very enthusiastic to take part in the gardens and even spent their break times attending to the garden*" (RJ, 19 September 2018). Participants, however, did mention that learners would "*bunk classes for gardening"* (PRA-M6, S-C), pointing to their commitment, yet also to undesirable behaviour.



Photograph 4.25: Benefits of involving learners in vegetable gardens (School B)

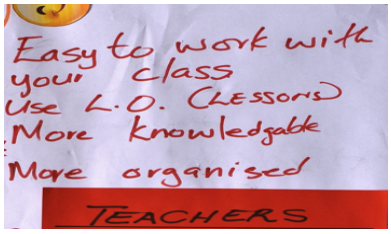


Photograph 4.26: Benefits of involving learners in vegetable gardens (School F)

Closely aligned, teachers were regarded as able to add to the success of vegetable gardens if committed to do so. If teachers were involved and committed they could provide support and guidance to the learners and other role-players. Participants from School E, for example, indicated that dedicated teachers could give "*guidance that is*

needed" (PRA-M11, S-E). In the participants' experience, teachers who were committed tended to integrate garden activities in the curricula of Natural Sciences, Life Sciences, Technology and Mathematics, as captured in Photographs 4.27 and 4.28.

Photograph 4.27: Benefits of involving teachers in the vegetable garden of School C

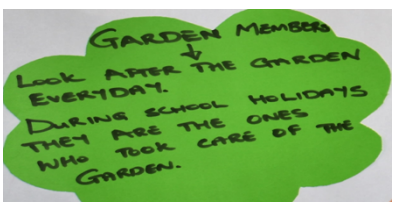


Photograph 4.28: Benefits of involving teachers in the vegetable garden of School G

Finally, participants regarded committed gardeners as key to successful school-based vegetable gardens. A participant from School E, for example, stated that *"having a gardener, well it takes a load off my shoulders"* (I1, S-E, P1). The commitment of gardeners was furthermore captured in contributions such as *"during school holidays they are the ones who took care of the garden"* (PRA-M17, S-H).

4.2.3.3 Sub-theme 3.3: Implementing innovative plans and finding solutions to problems

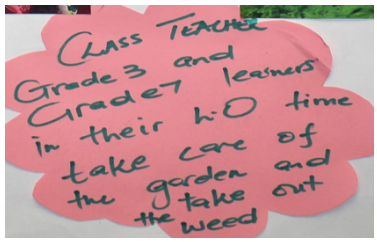
Due to the many challenges that individuals face in resource-constrained communities, it is important for teachers and other role-players to use the available resources and involve role-players in developing innovative solutions for the experienced challenges. In this regard the involvement of the role-players allegedly allowed for innovative plans and solutions to be developed when facing challenges that could negatively influence the sustainability of a vegetable garden. As already indicated, community gardeners were identified as a resource for resolving challenges faced during school holidays and over weekends, and for preventing vandalism and theft. The way in which community gardeners assisted in addressing problems are captured in Photographs 4.29 and 4.30.



Photograph 4.29: Benefits of involving community gardeners in the vegetable garden of School H

Photograph 4.30: Benefits of involving community gardeners in the vegetable garden of School I

In solving the problem of limited available human resources involved in vegetable gardens, teachers reportedly started involving learners in creative ways. Teachers would, for example, integrate garden activities in Life Orientation lessons as well as in the Natural Sciences, Life Sciences, Technology and Mathematics curricula, as depicted in Photograph 4.31. As such, vegetable gardens could be maintained while learners benefitted from a curriculum being made practical. In support of this perceived positive effect, participants from School B reported that NGOs involved in the community tended to encourage learners to engage in garden activities by providing *"activities for the learners"* (PRA5, S-B), and then using the garden for activities that could promote curriculum integration.



Photograph 4.31: Benefits of involving teachers in the vegetable garden of School G

4.2.4 THEME 4: CHALLENGES ASSOCIATED WITH INVOLVING THE VARIOUS ROLE-PLAYERS

This theme relates to teachers' experiences of challenges associated with involving role-players in school-based vegetable gardens. Three related sub-themes apply, with the relevant inclusion and exclusion criteria captured in Table G-4 in Appendix G.

4.2.4.1 Sub-theme 4.1: Environmental and resource-related challenges

Participants from several of the schools noted challenges such as broken or dysfunctional equipment, pests destroying produce, and a lack of funding and equipment. These challenges affected the way in which role-players could fulfil their responsibilities in school-based vegetable gardens. A participant for example explained how pests posed a distinct challenge, stating, *"What's the point in watering and taking care of it and nurturing it when there's pests?"* (I1, S-E, P1). As such, a shortage of funding, tools and equipment as well as other environmental challenges seemingly affected the ability of teachers, learners and gardeners to sustain gardens.

A lack of enough skilled and trained teachers was perceived as another challenge. In this regard participants from School F shared the view that *"teachers are not thoroughly trained"* to work in the vegetable gardens (PRA-M13, S-F). Participants from School C

agreed, saying that teachers "*lack skills*" (PRA-M6, S-C). In support of this outcome, I noted: "*Teachers were often untrained and due to this they were less likely to be involved as they felt they could not provide sufficient support"* (FN, 18 September 2018).

Even though learners were regarded as a resource that could assist, participants reported that some learners displayed destructive behaviour in vegetable gardens and would cause damage to garden produce, thereby posing a definite challenge. In this regard, the participants from School H indicated that some learners were "*picking out seedlings*" (PRA-M18, S-H). In support of this response a participant from School E explained that some of their learners "*throw stones in the garden and pick out things and destroy it"* (I1, S-E, P1). Furthermore, participants referred to learners foraging before the produce was ready to be harvested and not thoroughly weeding the garden. In terms of these experiences, it can be deduced that a lack of discipline or limited knowledge and experience of the learners in gardens is at the core of this challenge.

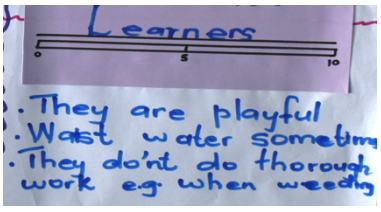
4.2.4.2 Sub-theme 4.2: Limited involvement, compliance and commitment by certain role-players

In the same way that the commitment of role-players was regarded as having added to the success of school-based vegetable gardens, limited commitment was reported to be detrimental. Limited involvement by, for example principals, was regarded a major hindrance to the success of school-based vegetable gardens. A participant from School I summarised this view by indicating that "*you can have your passion but if the principal of the school doesn't buy your idea you'll just die with it"* (I4, S-I, P4). Participants were furthermore of the opinion that limited involvement by principals would ultimately result in limited involvement of other role-players, such as teachers and learners. A participant elaborated by saying, "*If the principal is involved the teachers would be involved and the learners would be involved, you know it's a ripple effect"* (I1, S-E, P1).

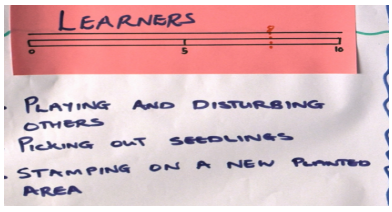
Despite the fact that many teachers seemed committed and involved in several of the schools that participated, some schools indicated limited commitment and involvement by all role-players as a challenge. Participants indicated that teachers sometimes were "*not all willing to go to the garden*" (PRA-M18, S-H). Furthermore, participants from School A referred to a "*clash amongst educators who are involved in garden project and those who are not part"* (PRA-M1, S-A) when discussing their school-based vegetable garden; with this inevitably posing challenges. Limited involvement and commitment by teachers in turn had other negative effects, such as learners not becoming involved or being motivated. Participants said "*it's a bit difficult to involve other classes because the*

teachers are not as involved" (I1, S-E, P1) and referred to teachers' tendency to "*overlook learner involvement"* in the garden (PRA-M2, S-A). To this end I reflected as follows: "*Due to the lack of involvement by teachers very few learners were involved in the garden; it seemed that the other teachers did not attempt to use the garden in their lessons or incorporate it into the curriculum in any form*" (RJ, 21 September).

Another challenge experienced by the participants related to learners not displaying sufficient compliance when working in the vegetable gardens, sometimes exhibiting playful and disruptive behaviour. During an interview a participant noted that "*if we take too many children they are playing"* (I3, S-A, P3) or that learners would waste or display unacceptable behaviour, as captured in Photographs 4.32 and 4.33.



Photograph 4.32: Challenges of involving learners in vegetable gardens (School B)



Photograph 4.33: Challenges of involving learners in vegetable gardens (School H)

Two of the participating schools referred to parents' lack of commitment, involvement and compliance, which posed challenges to the success and sustainability of their vegetable gardens. Teachers, for example, regarded the tendency of parents to "*drop away easily*", quarrel with other role-players, and not be able to work with involved learners (refer to PRA-M2, S-B in Appendix E) as challenging. In support of this perception, a participant from School E shared her experience that "*no parents coming to volunteer"* (I1, S-E, P1) as being a challenge in terms of the maintenance and sustainability of their garden.

4.2.4.3 Sub-theme 4.3: Time-related challenges

Participants reported that time-related challenges were experienced by various groups of role-players, such as learners, teachers and parents. With regard to learner involvement, participants, for example, reported that "*time is a major challenge*", as the involvement of learners in vegetable gardens could be seen as time consuming and requiring the utilisation of classroom time. In elaborating on this view, participants from School A reported that learners "*need to be supervised all the time*" (PRA-M1, S-A), a view that was confirmed by participants from School G, who commented that learners required supervision, which is time-consuming (refer to PRA-M15, S-G in Appendix E).

As indicated in a previous section, the degree of teacher involvement in school-based vegetable gardens varied – most probably due to time constraints limiting the participation of some of the teachers. When elaborating on this perception during the PRA-based workshop, several time-related reasons were given for teachers' limited involvement, such as "*don't have spare time for the garden*" (PRA-M6, S-C), and they "*can't sacrifice their timing e.g. (holidays)*" (PRA-M15, S-G). It was furthermore suggested that teachers became distracted, for example during examinations. During such times, teachers would reportedly not focus on the maintenance of their vegetable gardens, posing challenges in terms of success and sustainability.

Some of the participants noted that parents were "*not always available*" to take part in vegetable garden activities (PRA-M15, S-G). In this regard, a participant explained that "*parents stay in the rural areas and it's not easy for them to come here because there's no transport coming here*" (I2, S-H, P2). As such, despite the commitment of many of the role-players to participate and fulfil a role in sustaining their vegetable gardens, certain challenges were experienced that occasionally limited success and had to be addressed for the vegetable gardens to succeed and be sustained.

4.3 FINDINGS OF THE STUDY

In this section I relate the identified themes and sub-themes to existing literature. In preparation of my discussion of the findings, I compared the results I obtained with the existing literature I presented in Chapter 2. I include a summary of the comparison I compiled in Appendix H.

4.3.1 SUPPORTING THE SUCCESS AND SUSTAINABILITY OF SCHOOL-BASED VEGETABLE GARDENS BY INVOLVING VARIOUS ROLE-PLAYERS

The findings of this study point to teachers and learners being the primary role-players in school-based vegetable garden initiatives in South African resource-constrained communities. This finding correlates with Rendall-Mkosi et al.'s (2013) research, as well as the South African Department of Education's (2009) proposal that emphasises the essential roles of teachers and learners in the success of vegetable gardens. Teachers typically assume a supervisory role by coordinating learners, or participate independently in activities involved in school-based vegetable gardens. This finding is aligned with the DoE's (2009) requirement that a designated teacher oversee all operational responsibilities associated with a school-based vegetable garden, by managing and supervising the garden activities and other role-players involved.

In addition to my finding that a dedicated teacher typically leads a vegetable garden project, my study highlights the importance of nutrition committees at schools, comprising teachers, principals and other role-players that can support the designated teachers in charge of the gardens. This finding is aligned with that of Rendall-Mkosi et al. (2013) who propose the establishment of designated committees at schools with vegetable gardens, comprising the school principal, selected teachers and other role-players that may provide support in maintaining such gardens.

As suggested in existing literature, school principals are regarded as vital in the establishment and maintenance of school-based vegetable gardens by the participants in the current study. In terms of this finding, my study foregrounds the role of the principal as leader, manager and supervisor. Likewise, the DoE (2009) expects of principals to assume a managerial role in vegetable gardens and to provide support to teachers in managing school-based garden projects. This finding is aligned with the work of Mawela and Van den Berg (2018) who indicate that principals can provide support by securing garden equipment, supplies and funds for such initiatives.

Even though the Departments of Health and Basic Education (2012) suggest the establishment of school-based support teams as part of the NSNP, I did not obtain results relating to such teams that may provide support in managing school-based vegetable gardens. This silence in terms of what literature proposes and what I found may perhaps be ascribed to the NSNP not being optimally implemented in all schools by the DBE yet; however, this is a working assumption that requires further research before a conclusion can be reached. This assumption is however aligned with the results of the current study, indicating that the DBE was not consistently involved as role-player in all school-based vegetable gardens, resulting in teachers not receiving the necessary support or resources from the DBE as required by legislation. This is in contrast with indications by the Departments of Health and Basic Education (2012) according to which the DBE is involved in all schools that implement the NSNP and that have vegetable gardens. Further research is required to clarify these contradictory findings (Department of Planning, Monitoring and Evaluation & DBE, 2016).

Next, I found that gardeners and caretakers were involved to some extent in school-based vegetable gardens, providing support in the form of managing gardens, supervising the cultivation of land, and maintaining vegetable gardens on a daily basis. This finding underscores the work of the Collective School Garden Network (2015b), in which the role of gardeners and caretakers is foregrounded as one of year-round support by maintaining and managing vegetable gardens at schools. My study furthermore builds on existing

literature on the role of gardeners and caretakers by highlighting their role in maintaining gardens during times when teachers may find it difficult to attend to this task, e.g. during school holidays. In return, gardeners and caretakers would typically have access to nutritional food, thereby having the potential to address food-related needs and food insecurity.

In terms of parent involvement, my study indicates this as being less common, with limited or even no support from parents for school-based vegetable gardens. In support of this finding, Laurie et al. (2017) indicate that parent involvement in school-based vegetable gardens can be predicted as being around 36%, which is rather high. In addition to the role of teachers, learners, gardeners and to a limited extent parents, my study indicates that NGOs (such as EduPlant) can fulfil a role in school-based vegetable gardens in resource-constrained communities by providing schools with resources such as funds and equipment. This finding correlates with the work of Food and Trees for Africa (n.d.) that foregrounds the work of EduPlant in collaboration with the DBE to provide schools with equipment in support of school-based vegetable gardens.

According to the DBE (2015), Nestlé may also provide support to schools with vegetable gardens by, for example, facilitating educational workshops with teachers and other role-players, providing them with knowledge on sustainable food production. As no mention was made of this in my study, it may be possible that the Department of Planning, Monitoring and Evaluation and DBE's (2016) involvement in all school-based vegetable gardens in resource-constrained areas is not optimal yet. As such, the involvement of supportive NGOs may be limited, pointing to the need for further research in this field.

Finally, my study indicates that community members can also be involved in school-based vegetable gardens by assisting teachers in the establishment and maintenance of such gardens. However, this finding does not align with the work of Rendall-Mkosi et al. (2013), neither with that of the Department of Planning, Monitoring and Evaluation and DBE (2016), which both indicate that community participation in gardens is less common to occur, with few community members actively participating or being involved at all. This contradictory finding may perhaps be ascribed to the context where I conducted my study, being characterised by poverty and high levels of unemployment. Taking this into account, as well as the practice of several schools to provide food from the gardens to community members who become involved, it may be possible that the community involvement I found to be prevalent can be ascribed to the possibility of having access to nutritional food, or experiencing meaning in life by fulfilling a valuable role. These are, however, mere working assumptions that require further research.

Therefore, in summary, I found that a sustainable school-based vegetable garden requires committed individuals, often one teacher or school principal driving the initiative. This individual is typically driven by establishing the dream of a sustainable garden that may address several challenges. Such a person requires support by other individuals who can take joint responsibility and ownership for their tasks. This finding is consistent with the work of Shimpo et al. (2019) who indicate that, for a school- and community-based vegetable garden to be successful, a dedicated individual is required who can coordinate the initiative. In addition, the support and participation of the principal will enhance the chances of success. This finding is aligned with that of Mawela and Van den Berg (2018) who indicate that proactive involvement and support by school principals is required for teachers to manage school-based vegetable gardens successfully, achieve stipulated outcomes and mobilise additional role-players to assist.

Committed, supportive role-players who take ownership of their responsibilities in school-based vegetable gardens will in turn contribute to the success and sustainability of any garden initiative. This finding is acknowledged by the Department of Planning, Monitoring and Evaluation and DBE (2016) as well as Johnson and Duffek (2008) who indicate that, by involving committed supportive role-players, participation will increase and resources and support may be accessed more easily. In further support, the Departments of Health and Basic Education (2012) indicate that once role-players such as school principals, learners, teachers, gardeners and parents buy into a garden initiative and display commitment, successful implementation is possible.

4.3.2 PROS AND CONS OF INVOLVING VARIOUS ROLE-PLAYERS IN SCHOOL-BASED VEGETABLE GARDENS

Involving various role-players in school-based vegetable gardens implies both benefits and challenges. In my study I found that learners, for example, gained valuable knowledge and skills with regard to health promotion, sustainable food production and nutrition by being involved in vegetable gardens at the respective schools, which may support them to overcome health and food-related challenges. This finding supports the work of Laurie et al. (2017), Mawela and Van den Berg (2018), as well as Rendall-Mkosi et al. (2013) who state that learner involvement in school-based vegetable gardens will increase their nutrition and food knowledge, and equip them with practical knowledge and skills that may later support them to sustain their health. In addition to gaining knowledge and skills, I found that the learners who were involved in the vegetable gardens were perceived as experiencing personal gains such as improved self-esteem and a sense of responsibility. This finding confirms those of Johnson and Duffek (2008) as well as Stors

and Heymann (2017) who indicate that, by caring for vegetables, learners will develop self-confidence, self-esteem and a sense of responsibility for their own sustainable health development as well as for the sustainability of the garden.

Additionally, I found that teachers were able to incorporate school-based vegetable garden activities into the school curriculum, which in turn benefitted learners as they could experience their subjects in a practical way. This finding is consistent with the work of the Collective School Garden Network (2015b) which states that teachers are in the position to incorporate school-based vegetable gardens meaningfully into the school curriculum and utilise the potential of school-based vegetable gardens as an educational tool as they have access to both learners and vegetable gardens daily. This in turn propagates learners' acquisition of knowledge and skills.

Teachers, learners and other role-players in the current study furthermore benefitted from being involved in having access to fresh garden produce, and being able to consume increased amounts of fruit and vegetables. This finding is aligned with the work of Boeing et al. (2012), Burt et al. (2017) as well as Oldewage-Theron and Egal (2015) who state that the involvement in school-based vegetable gardens will provide role-players with the opportunity to consume garden produce, increase their nutrient intake, improve their overall health, and acquire healthy eating habits that can be implemented throughout their lives.

Role-players in the current study were able to share their past experiences, knowledge and ideas with others, thereby building up a repertoire of context-specific knowledge and skills when establishing and maintaining vegetable gardens. In this regard Pourias et al. (2016) comment that a specific function of vegetable gardens relates to individuals in supervisory roles providing knowledge and skills about gardening to other individuals, who as a result may develop their own knowledge and skills.

The challenges experienced by the role-players in this study primarily relate to limited resources, the continued involvement of committed role-players and time constraints. I thus found a lack of funds, basic garden equipment and resources to be a distinct challenge when initiating school-based vegetable gardens in resource-constrained communities. This finding is consistent with the work of Laurie et al. (2017) who state that role-players often experience challenges of not having access to basic resources, support and funds when involved in school-based vegetable gardens.

Closely related, the participants in the current study complained about crop and equipment theft. This finding is supported by Qila and Tylio (2014) who found that

caretakers and teachers may take garden produce without the agreement of others. In order to solve this challenge, teachers in the current study involved community gardeners who looked after the gardens when the teachers and other role-players could not, thereby preventing theft and vandalism from occurring, and ensuring the presence of someone who could take care of the garden at all times. This finding is aligned with the work of the Collective School Garden Network (2015a, 2015b) that indicates that, by involving the neighbours of a school, safety and security can be provided as they watch over the garden. As such, my study adds new insight into what is already known in this field, by indicating community gardeners as being able to fulfil the role of providing safety and security when it comes to school-based vegetable gardens.

The findings I obtained also point to a lack of commitment and active participation by some role-players, despite others driving the process and contributing on an ongoing basis. In this regard Laurie et al. (2017) indicate that a lack of commitment and support by parents will negatively influence the successful establishment of school-based vegetable gardens. In addition, Mawela and Van den Berg (2018) state that teachers too may display a lack of ownership and commitment as participation in a vegetable garden implies additional work that teachers do not receive financial compensation for.

To increase the level of involvement of learners and the long-term sustainability of school-based vegetable gardens, teachers and other school-based role-players in my study incorporated garden activities in the school curriculum by using these in the lessons presented to learners. In support of this finding the Collective School Garden Network (2015c) indicates that, by integrating vegetable gardens into the curriculum and utilising them as a learning instrument, the sustainability of a garden may be enhanced if learners remain involved in maintenance activities. However, when involving learners in school-based vegetable gardens, the added potential challenge exists of them being disruptive and destructive where they may damage garden produce and equipment, and not listen to teachers. In support of this finding, Burt et al. (2017) state that classroom management difficulties may also occur when teachers use garden activities in their lessons with learners; with this also being confirmed by my findings.

Untrained and unskilled teachers are yet another potential challenge highlighted in my study, where teachers seemingly did not receive the necessary training from the DBE to contribute to their respective gardens effectively. Likewise, the Department of Planning, Monitoring and Evaluation and DBE (2016) indicates that teachers are often not sufficiently trained in human resource management and time management. Furthermore, in support of this finding, Pourias et al. (2016) indicate that some role-players may lack

the relevant food production knowledge and skills, and as a result contribute insignificantly to any school-based vegetable garden initiative.

Next, I found that time constraints posed a challenge to teachers who had limited spare time and were thus not able to participate fully or supervise learners while they participated in garden activities. This finding is aligned with the work of Mawela and Van den Berg (2018) who state that the management of a garden may be time-consuming and not allow teachers and principals to focus fully on their teaching and managerial duties. Finally, the DBE was not indicated as a source of constant support by all schools participating in my study, as the DBE reportedly neglected the provision of resources to some schools. The DBE was not found to be involved in regular monitoring of the status of the gardens in all nine schools. This finding is supported by Mawela and Van den Berg (2018) as well as the Department of Planning, Monitoring and Evaluation and DBE (2016) that indicate that, due to the poor implementation of the NSNP, all schools in South Africa are not yet receiving the necessary resources or support, with some schools receiving no input from the DBE at all.

4.4 CONCLUSION

In Chapter 4 I presented the results of my study in terms of the four main themes and related sub-themes that I identified. I then related these results to existing literature in presenting the findings I obtained.

In the following chapter I address the research questions that guided me in undertaking this study. I outline the potential contributions of my study and reflect on the possible limitations and challenges I experienced. Finally, I formulate recommendations for training, policy and practice, and future research.

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CHAPTER 5
CONCLUSIONS AND RECOMMENDATIONS

5.1 INTRODUCTION AND OVERVIEW OF PRECEDING CHAPTERS

In **Chapter 1** I introduced my study, which focuses on a detailed understanding of teachers' experiences when involving different role-players in school-based vegetable gardens. I formulated the research questions, explained key concepts and stated my working assumptions. I introduced the selected theoretical framework, paradigmatic perspectives, research process and methodological strategies, and discussed the ethical considerations and quality criteria I adhered to.

In **Chapter 2** I explored existing literature related to the topic of my study. I focused on the health and food-related status of South Africa, challenges typically experienced by resource-constrained communities as well as the importance of addressing such challenges. I then explored school-based vegetable garden initiatives as a potential way of addressing such challenges, contemplating role-players in such initiatives. I also discussed the theoretical framework that guided my study.

Chapter 3 entails my discussion of the research process and research design. I explained the epistemological and methodological choices as well as the selection of cases and participants. I then justified the selected methods of data generation, documentation and analysis.

In **Chapter 4** I presented the results of my study in terms of the four main themes I identified following inductive thematic analysis. Next, I discussed the findings by relating the results I obtained to existing literature in the field.

In this chapter I draw final conclusions by addressing the research questions I formulated in Chapter 1. I discuss the potential contributions of the study as well as possible limitations and challenges I experienced. I conclude with recommendations for training, policy and practice, and future research.

5.2 CONCLUSIONS

In this section I draw conclusions based on the findings I obtained. I structure my discussions according to the research questions that directed my study, first attending to the secondary and then the primary research questions.

5.2.1 SECONDARY RESEARCH QUESTION 1: WHICH GROUPS OF ROLE-PLAYERS CAN POTENTIALLY BE INVOLVED IN SCHOOL-BASED VEGETABLE GARDENS?

The findings of my study highlight the possibility of involving various groups of role-players in school-based vegetable gardens in resource-constrained communities. These include school-based as well as community-based role-players. At schools, teachers, learners and school principals can fulfil significant roles. On an external level parents, community members, community gardeners, school-based nutrition committees, caretakers, NGOs and officials from governmental departments can play a role. The findings of my study furthermore indicate that certain role-players, such as teachers, learners, principals and gardeners were generally involved more frequently than others. However, all groups made a positive contribution to the successful implementation of school-based vegetable gardens.

Based on the findings I obtained I posit that teachers and learners will thus make the biggest contribution to school-based vegetable gardens in terms of the responsibilities they fulfil and the support and resources they can offer. I argue that the sustainability of school-based vegetable gardens will be notably impeded if teachers and learners are not actively involved. Therefore teachers are advised to guide and support learners actively so that they may in turn contribute to the overall success of vegetable gardens. Throughout, the involvement of school principals will make a positive difference to the outcome of such garden initiatives.

In the next section I elaborate on specific roles that each group of role-players can potentially fulfil. I attend to both school-based and community-based role-players.

5.2.2 SECONDARY RESEARCH QUESTION 2: WHAT ARE THE ROLES OF EACH ROLE-PLAYER?

Teachers generally assumed a supervisory role by coordinating, organising and managing garden activities. They involved learners in maintenance activities, such as planting, watering, weeding and harvesting, and in many cases integrated garden activities in the school curriculum to some extent. In the process teachers provided learners with valuable knowledge and skills, as well as support and encouragement. In terms of teacher involvement, the findings of my study emphasise the importance of a dedicated teacher (or individual) who is passionate about the vegetable garden and can take ownership and responsibility for the success of the project. Based on the findings I obtained I posit that the involvement of dedicated teachers in vegetable garden initiatives is a prerequisite for success and sustainability.

In all schools involved learners participated in school-based vegetable garden activities, fulfilling a role in the successful management of the respective gardens. They contributed to maintaining gardens by, for example, planting seeds, watering, weeding, and harvesting produce. Based on the findings of the current study, learner involvement in vegetable gardens is regarded as valuable, as gardens can in this manner be utilised as an educational instrument, allowing learners to gain knowledge and skills on sustainable food production, while also experiencing personal development.

In my study some school principals assumed the role of leader and manager of garden initiatives, yet others were not involved in a hands-on way. I found that some principals provided support to teachers and other role-players by obtaining funds and resources, networking with potential stakeholders and appointing one or more dedicated teachers to manage the garden. Without the support of the principal, teachers generally experienced difficulty in addressing the challenges they faced and in ensuring successful management of the vegetable garden. As such, it can be concluded that commitment and active involvement of a school principal will promote the success and sustainability of a vegetable garden.

Gardeners supervised and managed school-based vegetable gardens and took charge of them during school holidays, thereby providing teachers with valuable support. In addition to teachers, learners, school principals and gardeners, my study's findings point to minor contributions by parents, NGOs, and governmental departments. In this regard several schools indicated the important role of the DBE.

5.2.3 SECONDARY RESEARCH QUESTION 3: WHAT IS THE VALUE OF INVOLVING DIFFERENT GROUPS OF ROLE-PLAYERS IN SCHOOL-BASED VEGETABLE GARDENS?

Based on the findings of my study I can conclude that the involvement of different role-players in school-based vegetable gardens implies definite value. Each group of role-players contributed in a specific way to the garden initiative they were involved in; in my study however, learners, teachers, school principals and at times gardeners seemed to have made the greatest positive contribution to the overall sustainability and successful implementation of school garden initiatives.

By involving learners in school-based vegetable gardens the learners were able to acquire knowledge and practical skills regarding nutrition, health promotion, making positive food choices and managing sustainable food production. Newly acquired knowledge and skills can positively affect learners throughout their lives if applied daily. Personals gains such as boosted self-esteem, increased self-confidence and a sense of

responsibility when assisting in the gardens were also linked to learner involvement in school garden initiatives in this study. As learners generally seemed committed and eager to help in the vegetable gardens, they contributed to the sustainability and viability of the gardens in the respective schools.

For teachers, the findings of my study point to the value of them acquiring knowledge and skills while contributing to school-based vegetable gardens being managed effectively. In addition to the value of motivated teachers, more specifically a teacher or other individual driving the project, I found that school-based vegetable gardens will benefit greatly if principals are enthusiastic and actively involved. A passionate teacher will generally run a school-based vegetable garden with the help and support of the school principal and other teachers. In addition to other benefits, teachers can view vegetable gardens as an educational tool that can contribute to not only sustainable health development and food production, but also to providing opportunities to put the curriculum into practice when integrating garden activities in the school curriculum.

According to the findings of the current study, school principals can add great value to school-based garden initiatives by providing teachers with support and resources. Without a leader or individual who provides support and motivates others, the role-players in vegetable garden projects may struggle to identify innovative solutions to challenges and to manage their gardens effectively. To this end I can conclude that the commitment, buy-in and support of the school principal is essential for a garden to be successful and sustainable. In addition, if community members are involved, supportive and committed, the sustainability of such an initiative will increase even further.

Therefore I propose that people who plan and initiate school-based vegetable gardens make careful decisions in terms of whom to involve. The teacher or school principal driving such an initiative needs to promote the active involvement and participation of teachers, learners and others who may make a contribution to the overall viability and sustainability of the garden. Role-players involved in school-based vegetable gardens can be encouraged to view vegetable gardens as spaces that can foster the cultivation of knowledge and skills, subsequently making a positive contribution to the community.

5.2.4 SECONDARY RESEARCH QUESTION 4: WHICH CHALLENGES MAY BE EXPERIENCED WHEN INVOLVING DIFFERENT GROUPS OF ROLE-PLAYERS?

The findings of my study highlight several potential challenges that can be experienced when involving different role-players in establishing and maintaining a school-based vegetable garden. These challenges include environmental and resource-related

challenges, time-related challenges and a lack of commitment, involvement and ownership by role-players. Such challenges may negatively affect school-based vegetable gardens and restrict a garden's sustainability.

The environmental and resource-related challenges experienced in the context of my study related to, among other things, a lack of sufficient funds, support and resources by the DBE that seemingly negatively influenced some of the garden initiatives. Teachers in resource-constrained contexts may not have easy access to resources if they are not provided with these, resulting in the possibility of a vegetable garden project failing due to a lack of resources or limited access to resources. In addition, due to the implementation of the NSNP by the DBE not being fully completed, schools in such communities may be impacted by a lack of the necessary resources to create and maintain a garden. Additionally, many of the teachers involved in my study were untrained and had not received the necessary support in terms of educational workshops offered by for example the DBE to lead a vegetable garden project.

A lack of commitment and ownership by the various role-players was also found to be a challenge to the sustainability of garden initiatives in the current study. This included an apparent lack of ownership by selected learners, seen in their becoming disruptive and destructive, and damaging garden equipment, garden produce and fences. A lack of participation by teachers, learners, parents and some school principals was another challenge that some of the teachers experienced and that hindered the progress of the gardens due to the resulting lack of support and required resources.

Furthermore, I identified some time-related challenges, implying that role-players did not fully participate in garden initiatives due to the time-consuming nature of maintaining a school-based vegetable garden. Some teachers as well as other role-players experienced their working in the garden as not allowing them with sufficient time to complete their other responsibilities, such as teaching and administration. In this regard both teachers and school principals were of the opinion that involvement in the garden would add to an already heavy workload.

Based on the findings I obtained I can conclude that, even though school-based vegetable gardens may offer good learning opportunities, certain challenges will remain when involving various role-players. However, I argue that, with careful planning and consideration, teachers can safeguard themselves against these challenges by developing innovative plans and solutions. For example, due to theft and vandalism being experienced by the teachers in some of the schools, they started offering small plots of

land to community gardeners who could care for these sections of the gardens all year round and who could then also provide security by protecting the gardens against theft. Therefore I believe that challenges need not be regarded as problems that cannot be addressed but rather as opportunities where teachers, school principals and learners can apply critical and creative thinking and build collaborative relationships with other role-players to be able to overcome the challenges they encounter.

5.2.5 PRIMARY RESEARCH QUESTION: WHAT ARE TEACHERS' PERCEPTIONS OF THE INVOLVEMENT OF DIFFERENT ROLE-PLAYERS IN SCHOOL-BASED VEGETABLE GARDENS IN RESOURCE-CONSTRAINED CONTEXTS?

Based on the findings of my study, I can conclude that the teachers' perceptions of involving different role-players in school-based vegetable gardens were generally positive, despite some challenges they experienced. Role-players generally contributed to the sustainability and successful implementation of garden projects in schools, if involved in such initiatives. Despite the challenges that teachers experienced, they were able to implement innovative plans and find solutions for the challenges they faced.

Teachers willingly collaborated with diverse groups of role-players, such as learners, school principals, parents, community members, gardeners, caretakers, NGOs, officials from the DBE and other external stakeholders. This highlights an aspect of Ozer's (2007) model, namely the reciprocal nature of school-based vegetable gardens, as the varied contributions of each role-player seemingly co-determined the successful implementation of the garden initiatives.

Based on the study I completed, I posit that schools with successful vegetable gardens will involve learners and teachers as primary role-players, supported by a dedicated school principal. I contemplate that, if there is an individual (e.g. a teacher) who is passionate about gardening and is motivated and driven, he or she can lead the garden initiative and obtain success. Such a teacher or garden coordinator can organise and supervise the vegetable garden and all activities involved. Other teachers can in turn assume a supervisory role when involving learners, organise garden activities and integrate these into the curriculum. Principals can fulfil a managerial role, mobilising resources and support, empowering teachers and other role-players, and allowing teachers to dedicate some of their time to the garden. School principals can furthermore provide support and contribute to the success of school-based vegetable gardens by uniting and motivating the role-players and school community in managing the garden.

Furthermore, I found that the teachers experienced the involvement of learners as instrumental in the maintenance of school-based vegetable gardens. Learners' contribution was invaluable as they maintained the gardens by, for example, watering, planting, weeding and harvesting the garden produce. They were generally committed and took responsibility for the garden. To this end I argue that learners will benefit by being involved in vegetable gardens in terms of their personal development as well as the improvement of their overall health. I furthermore posit that, even though teachers may experience some challenges when involving learners in vegetable gardens, the benefits of a school-based vegetable garden outweigh the drawbacks involved.

Parents and community members were involved in some of the school-based vegetable gardens forming part of my study; however, they often lacked the necessary commitment and were therefore not optimally involved. In this regard I contemplated the value of involving community members and posit that, if they are to be involved, they can support teachers and help create sustainable solutions to the challenges experienced. For example, in my view community gardeners can fulfil a vital role by providing teachers with support over weekends and holidays and guarding against theft and vandalism. The DBE can also assume a more supportive role by providing resources, support and funds. This form of support was found to be insufficient in the schools involved in my study.

Finally, I conclude that if teachers, learners and school principals form the core of a gardening team, teachers will generally maintain positive and optimistic perceptions of the possible role-players, which may lead to establishing successful and sustainable school-based vegetable gardens. In linking the participating teachers' perceptions to Ozer's (2007) model of potential effects of school gardens, I propose that the impact of various role-players and their contributions, whether positive or negative, will directly and indirectly influence each component of a school-based vegetable garden initiative as well as the microsystems of the involved role-players.

5.3 POSSIBLE CONTRIBUTIONS OF THE STUDY

This study contributes to existing knowledge, literature and theory on school-based vegetable gardens, indicating which individuals to involve in such gardens, and which benefits and challenges may be associated with such involvement. In the South African context, where the incidence of resource-constrained communities is high, initiatives such as vegetable gardens can be utilised to provide nutritional support in poverty-stricken contexts. Insight in terms of the value of involvement of various groups of people may result in better practice in addressing vulnerability.

Next, this study adds to the knowledge base stemming from the broader STAR, SHEBA and FIRST-GATE research projects by providing valuable insight into teachers' experiences of the various role-players that may contribute to the sustainable implementation of school-based vegetable gardens. The study contributes to the body of knowledge related to the benefits associated with specific role-players, the experiences they may have and the potential outcomes in terms of sustainable school-based vegetable gardens, especially when role-players are committed and supportive.

Additionally, the current study may contribute to practice and knowledge application, as teacher participants may have augmented their own knowledge base during data generation discussions. Teacher participants may have gained knowledge from one another when sharing their own unique experiences. As a result, teacher participants may apply the newly gained knowledge and skills to influence their practice positively in initiating and maintaining school-based vegetable gardens.

Finally, my study may provide meaningful perspectives for other teachers involved in school-based vegetable gardens in other communities in South Africa, when learning about the findings I obtained. Workshops can, for example, be developed where teacher participants from this study share their perceptions with other teachers who may in turn be equipped to make informed decisions about which role-players to involve in vegetable gardens at school.

5.4 CHALLENGES AND POSSIBLE LIMITATIONS OF THE STUDY

The methodological choices I made imply a possible limitation related to the interactive relationships between a researcher and the participants remaining objective at all times. I safeguarded against this potential limitation by applying the strategy of reflexivity, whereby I acknowledged the influence I may have had on the studied phenomenon and the influence that the research may have had on me. I kept a reflective journal throughout the research process to reflect on my experiences and opinions. In addition, I employed the strategy of member checking.

Another potential limitation relates to the fact that qualitative research, similar to interpretivism, cannot result in generalisable findings. This was not my aim as I attempted to gain insight into the perceptions of 36 primary school teachers from specific resource-constrained communities. The aim of my study was thus to develop a detailed understanding of a specific group of teachers' perceptions in their specific contexts, and not to produce findings that can be generalised to other contexts.

A final potential limitation I identified relates to the fact that I conducted individual interviews at only five of the nine schools. Additional interviews may have provided a more comprehensive view of the phenomenon; however, as data saturation occurred and due to the limited scope of this mini-dissertation, I do not regard this challenge as relevant to my study.

5.5 RECOMMENDATIONS

In the following sub-sections I make recommendations for training, policy and practice, and future research.

5.5.1 RECOMMENDATIONS FOR TRAINING

This study provides an example of which groups of role-players to involve in school-based vegetable gardens to ensure the successful implementation of garden initiatives. As my findings foreground the benefits and challenges of different groups of role-players, teachers-in-training may benefit by acquiring knowledge that they can apply in practice once standing in the profession.

Due to the current study focusing on the experiences of teachers, the findings can thus be utilised for teacher training programmes in an attempt to promote a clear understanding by prospective teachers of role-players that may contribute to the success of school-based vegetable gardens. If teachers are aware of these findings they may be able to apply them in their own practice. Furthermore, students in health and supportive professions may benefit from receiving training in this field as they may be required to mobilise garden teams when working in the profession.

5.5.2 RECOMMENDATIONS FOR POLICY AND PRACTICE

The findings of this study may be applied in the resource-constrained community where I conducted the study in supporting the teachers to make informed decisions about which role-players to involve in school-based vegetable gardens. The findings may furthermore provide them with an awareness of the potential challenges and benefits they may experience during school-based vegetable garden projects. The findings of my study can furthermore be conveyed during information sessions to individuals in communities similar to the community where the study was undertaken. Information sessions may include sessions of knowledge and experience sharing, where role-players from other resource-constrained communities involved in vegetable gardens discuss their own experiences, implying the potential of role-players learning from another. Furthermore,

this study may provide guiding principles for others involved in school-based vegetable gardens, or inform future policy on the establishment of school-based vegetable gardens, and whom to involve, for which reasons.

Finally, I recommend that the DBE implement stricter policy implementation guidelines with regard to the NSNP to ensure the active involvement of the DBE in school-based vegetable gardens in all schools in South Africa. The DBE can consider more regular follow-up visits and monitoring their officials to ensure that they take ownership and fulfil their responsibilities.

5.5.3 RECOMMENDATIONS FOR FUTURE RESEARCH

Based on the findings of my study, I recommend the following for future research projects:

- Follow-up participatory research on the role of the DBE in ensuring food security by, *inter alia*, sufficient implementation of the NSNP and school-based vegetable gardens in resource-constrained communities.
- A descriptive follow-up study focusing on the role of teachers in school-based vegetable gardens, specifically with regard to an individual being passionate about this and driving the initiative.
- Descriptive research on the role of SBSTs in school-based vegetable gardens and the factors contributing to schools not establishing such support networks.
- An exploratory follow-up study focusing on the role of community members in school-based vegetable gardens, and the reasons for their involvement or lack of involvement in such garden projects.

5.6 CONCLUDING REFLECTIONS

In this study I aimed to explore and describe the perceptions of teachers when involving various role-players in school-based vegetable gardens in resource-constrained contexts in the Eastern Cape Province. The findings of my study highlight how teachers involved various groups of role-players, and outline certain challenges and benefits associated with the involvement of the different groups.

Teachers generally shared positive perceptions about involving different role-players, specifically learners, teachers, school principals and gardeners. Such a combination of role-players can support positive outcomes in terms of the sustainability and overall success of school-based vegetable gardens in resource-constrained communities, more so if such a team is supported by additional committed role-players.

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APPENDICES

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APPENDIX A: INFORMED CONSENT

UNIVERSITEIT VAN PRETORIA
UNIVERSITY OF PRETORIA
YUNIBESITHI YA PRETORIA

Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

REQUEST FOR PARTICIPATION AND INFORMED CONSENT

TEACHERS

Dear Sir/Madam

I am currently completing an MEd study in Educational Psychology at the University of Pretoria on the following topic: “Teachers’ perceptions of involving different role-players in school-based vegetable gardens in resource-constrained contexts”. My study forms part of the STAR project, led by Prof Ronél Ferreira, in which you have been participating in recent years. In my study I will aim to gain insight into teachers’ experiences and perceptions regarding the involvement of different role-players in school-based vegetable gardens.

You are herewith requested to participate in my study. Your participation is voluntary and you have the right to withdraw from the study at any time if you wish. All information which you provide will be treated as confidential and your name will be kept anonymous and not be made public to anyone. 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 generated data during your involvement, as well as to the final results of the project. The generated data will be stored in a secure place at the University of Pretoria for 15 years. As this is a funded project data will also be available in an open repository for public and scientific use where needed.

For the purposes of my study you will be requested to participate in participatory workshop sessions, taking the form of some writing/drawing activities and group discussions, which will be recorded in the form of posters, audio-recordings and photographs. In these workshop sessions you will be asked to tell us about your personal experiences on the involvement of different role-players in the establishment and management of your school-based vegetable garden, specifically regarding your preferences and reasons for involving specific role-players.

The benefit of this study is that the findings will be used to inform future attempts at creating sustainable and successful vegetable gardens at other schools in resource-constrained communities. For you, a potential benefit entails that you may gain an in-depth insight into your own experiences regarding your involvement in school-based vegetable gardens and how you may potentially apply your acquired knowledge and skills in the future. We will respect your dignity at all times, ensure you are protected from harm and not placed at risk while participating in the study.

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

Warm wishes

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Faculty of Education
Fakulteit Opvoedkunde
Lefapha la Thuto

INFORMED CONSENT

TEACHERS

Title of research project: Teachers' experiences of involving different role-players in school-based vegetable gardens in resource-constrained contexts.

I, _____ the undersigned, in my capacity as teacher at _____ (name of school) hereby agree to participate in the above-mentioned research. I understand that my contribution will be treated as anonymous and confidential, and that I have the right to withdraw from the study at any time, if I wish to do so.

Signed at _____ on_____2018.

_____ _____

Participant Researcher

_____

Witness

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APPENDIX B: Transcribed and coded interviews

My interview with Participant 4 serves as an example of how I analysed each interview. All five interviews can be viewed on the Compact Disk Read-Only Memory (CD-ROM) included at the back of my mini-dissertation.

Interview with Participant 4 from School I

Date of Interview: 18 September 2018

Supervisor: What we want to know from you, Tegan wants to know who is involved in this garden? Everybody that is involved and how and how do you do it and how do you manage it? And Lauren wants to know what's the role of the principal in a garden like that? So, I'll start the first question for you, the first person that is involved is a one with a passion so talk us through and we will record it.

Participant 4: Ja, but you can have your passion but if the principal of the school doesn't buy your idea, you'll just die with it. It's just unfortunate. So if the principal wants it, so you can fly your wings but if the boss of the school doesn't buy your story you can be passionate, you can be gifted, you can have all the resources but it's the school's principal that's the one who. Because especially in the townships because we are paying for water… so you need the advice from the principal where to go about when it is drought, which days can you choose, which amount so you must have the principal. It's a must!

Supervisor: So, it's a buy in from the principal, principals support as well as the connections? As well as the knowing where to go to for what.

Participant 4: Ja, where to go. Because at the end of the day if something goes wrong even in the garden the principal is still going to answer. Passionate as you are.

Supervisor: That's true. So, the principal must take accountability, that's why the principal must buy in.

Participant 4: Even if you get the sponsor, so you are not getting the seeds the tools, you are getting the funding it must go through

Even if there's a passionate teacher, support from the principal is still necessary to have a successful garden

If the principal isn't involved very hard to lead the garden initiative

Principal support is essential for the garden to be successful and sustainable

Need the buy-in from the principal

Principals is the one who will answer the garden

Principal is the leader, and overall manager of the garden

the schools account. So, everything must be passed by the principal before you go ahead.

Supervisor: Now tell us why, your garden is looking so good, who are you involving?

Learners are involved

Participant 4: I am involving my babies.

Supervisor: You are involving yourself, tell us about your role first.

Teacher as main coordinator of entire garden initiative
The teacher is passionate and driven, wants to integrate the garden with the curriculum

Participant 4: Mmm… My role is expanding everything. I am learning every day, I am expanding every day. I've got a new dream every day. So, it's a matter of a must, it must grow, and I want it to grow. And fortunately, I am a teacher, I want whatever relates to the book to be part... say its fundraising, how can we fundraise about the garden, say it's a project, if it's a science club, a theme which theme can we take from the garden so…

Supervisor: But you started the dream, ne? [Yes] the dream started with you and then, did you get other teachers involved?

One teacher having the dream of starting a vegetable garden

Participant 4: Yes. I've got a committee, because here at the school, everything we work in committees. You can't do anything on your own and what I love about working with committees even if I'm not here they know everything.

Committee helping manage the garden
Committee provides support

Supervisor: And how many people are in your committee?

Participant 4: There are 4.

Supervisor: And everybody's got a passion for the garden?

Entire committee are committed and passionate about the garden, they all know what is going on in the garden = working together

Participant 4: everybody's got a passion for the garden and everybody's got the know-how. Even if I am not here they can answer the same answers I'm telling you.

Supervisor: Tell us about the children, how do you involve, invite, the children here?

Participant 4: I involve the children per classes, a certain class, in my class I want to take them to the garden. So, all of them they know what is happening, they know what is happening.

Supervisor: So, do they come during class time? After school? when do they come here?

Participant 4: Most of the time they come during break time and after school.

Learners are involved and show commitment by coming to the garden in their break times

Co-researcher: What grade do you teach, sorry?

Participant 4: I am teaching grade 4, 5, 6, and 7.

Supervisor: And she's the deputy principal. She does everything! So, the ones that come in break time, they volunteer? They come here because they want to come.

Participant 4: They want to come because the garden we don't want to punish them with garden, we want them to come for fun, they must come to feed the worms like they know like the little ones if it's a day for fruit in the kitchen, so they eat a part of the fruit they don't eat so they go and feed the worms. So, it's the excuse now when they want to go to the garden they say they are going to throw the rubbish on the worms, they are going to feed the worms. So, it's a place where they want, like after school if others are practicing something and then they are waiting for maybe the neighbour or the sibling then they come and help in the garden. But it's a place for sort of relaxation it's not something that is a chore or a what, so if they want to.

Learners benefit from the garden produce by eating something from the garden most days

Learners show commitment and ownership of the gardens by helping out after school and while they wait to go home

Supervisor: And they help with planting and maintaining and watering? Everything?

Participant 4: They help with planting, watering, propagating, bringing like tins like I was doing in the eShoprite Spring Day. They were looking for eSpekboom for those coffee tins and the pilchard, tinned fish so they were bringing the tins, they were

Learners help with maintenance activities

bringing the coffee tins so that we can do the project from the school. So, without them I can't have 100 tins.

Supervisor: So, they're very involved?

Participant 4: But ja, they [Learners] are very involved, but its voluntary.

Supervisor: Okay, so the children and your four teachers and then…

Participant 4: And then, there are two gardeners.

Supervisor: The two gardeners, and are they employed by the school?

Participant 4: They are employed, yes, one by the NGOs but the other one by the Department of Education this year we are fortunate. But he is coming for 10 days only but it's quite a relief.

Supervisor: Okay, and the gardener that is employed by the NGO, does he come every day?

Participant 4: He comes every day, every day, he comes every day.

Supervisor: Okay and then, parents, volunteers?

Participant 4: We've got two community gardeners, they are planting for themselves, their families. So, we are just working with them, we are sharing whatever, so that even when we are not here during the weekends and holidays, so we need it for harvesting, we need for watering, for whatever. And now it is sort of a security because and what we are doing is we share the seedlings, if they've got seedlings, they share with me. If I've got seeds… Sometimes I just give them seed. And then when they're seedlings we just share. Because what we want is to have the same things so that no one is stealing from the other one. The school must not steal from the community and the community...

Learners are very involved, all voluntary = sign of commitment and ownership, they want to be in the garden

Two gardeners involved in the garden

NGO employs one gardener and DoE employs the other

Gardener providing support to garden everyday

Two community gardeners, who plant for themselves

They help the school by looking after the garden when the teachers are not there, they provide support and security
Providing security to reduce theft

Supervisor: So, they get a stand and produce and seeds and everything? And in return they look after the rest for you so they're like a protective factor?

Participant 4: Ja, but their produce is solely for them and if as a school we want something from them it's a matter of buying from not because they are in your school…

Supervisor: But there's only two, why?

P*articipant* 4: There's only two because of the space, no more space…

Supervisor: Would there be more that want to be involved, do you think?

Participant 4: No, we can't give them the other space, because you look now I've got different like I've got no place, it's a small place now and I have to expand that patch is for essential oils. For… So, we still have more things to expand.

Supervisor: And then something else that is very strong in your case is the networks that you have, that's also because you know when, who to phone and…

Participant 4: Yes, the municipality, the department of agriculture, the NGOs, the individuals, anyone who is interested in gardening. And what is important to the funders of the garden is to see progress, something that is sustainable, something that is sustainable. Nobody wants to fund something then they have to account for the funds from their business, there's nothing to show.

Supervisor: No, this is really amazing. Do you have more questions?

Researcher: Do you use the garden stuff to feed the children? Or do you…

Participant 4: Yes, twice a week. Because... On Tuesdays and Thursdays, we eat a samp with greens. So, we give... You see

Limited space

Municipality, Department of Agriculture and NGOs involved in garden

we've got a lot of spring onion and the spinach. So, every Tuesdays and Thursdays, it's a must. And we want to make, instead of giving one child certain family an organic veg, we are sure twice a week they are getting organic vegetables from the school. So, we are sure, sure, sure of everyone. Irrespective if your family can afford an organic vegetable but as a school it is our role to make sure that twice a week they get organic vegetables.

Learners benefit nutritionally from the garden

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APPENDIX C: Field notes

An example of my field notes is provided as hard copy. All field notes can be reviewed on the CD-ROM.

Field notes: Interview with Participant 2

Event:	Interview at School H
Place of workshop	School garden
Date	18 September 2018
Participant	2

This was a beautiful school, I could see there was a lot of care taken in the maintenance of the school and garden. I was actually very surprised at how well looked after the school and garden were, I later found out that the school has a caretaker as well as two gardeners who provide a tremendous amount of support and this can really be seen when looking at the school grounds

The lady I spoke to was the principal of the school and I was really impressed with how she took responsibility for making changes within the school. This confirmed my previous thoughts that principals take a more managerial role in the garden. She was extremely passionate and proud of her garden and what her teachers and school had managed to produce.

When I went out to view the garden, one of the teachers who is very involved in the garden was extremely excited to see us and showed us the entire garden, she was very enthusiastic and explained what was planted in each garden bed. She also explained to us that the weather had not be kind to the garden recently and it had been very windy, and that they had not received much rain. They had experienced a slight drought and that is why the vegetables looked slightly batted. She went on to explain their plan for getting the garden back on track and suggested we come and visit the garden in December or January when the garden would be in full bloom and then we would see it in all of its glory. She was very optimistic about the future and I got the impression that they all view the garden as a long term sustainable project. The principal did also mention that the garden was a tool to teach the learners how to grow vegetables so that they could go home and create gardens of their own and teach

Possible ownership of the school and garden by role-players

Caretaker and gardeners involved in garden

Gardeners and caretaker provide support and resources

Principal committed to making changes and assume a managerial role

Environmental challenges

Teachers committed and invested in future of garden

their families how to grow vegetables. I was made aware of how this correlates with my literature, as in my literature it says that gardens are a tool for learning as well as a tool to alleviate poverty and malnutrition. I was able to see this thinking in the teachers and how they view gardens as tool to create a sustainable and healthy life.

I was very surprised by how amazingly the school and garden seemed to be run as there were only 7 teachers involved. The principal stated that there was a school nutrition committee made up of the principal and the teachers which was in charge of the garden. She stated that the principal definitively needed to be involved in the garden and that the principal needed to show a certain level of commitment if the garden was to be successful. The principal was extremely knowledgeable and went on to express how she believed that in order for the garden to be successful there needs to be involvement within all the levels in the school. I found this statement correlated with a lot of my earlier thoughts, that in order to create a successful garden teachers, learners, parents, community members all need to work together.

The principal was very passionate definitely the driving force behind the garden.

Tool to teach learners how to grow own food

Generate knowledge and skills for learners

Commitment and ownership from a few teachers are needed for a garden to be successful

Nutrition committee with teachers and principal

Principal buy-in needed for garden to be a success

Principal source of knowledge

Role-players need to work together

Committed individual behind the initiative

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APPENDIX D: Reflective journal

An excerpt from my reflective journal is provided as hard copy. My full reflective journal is included on the CD-ROM.

Excerpt from my reflective journal –

Second field visit – 19 September 2018

I had thought that the amount of resources and people involved in the garden would be similar across the various schools. I thought that there would be other role-players involved for example, parents, community members, and NGOs. But I was quite surprised at the diversity of role-players involved in the gardens at the different schools. I also noticed that it takes one person with the dream of a vegetable garden, one committed teacher to be the driving force behind the garden. Committees had been set up at two of the schools which were very involved in the maintenance of the garden. The teachers involved in the gardens seemed to be involved in a nutrition committee which assumes responsibility for managing the garden and providing multiple teachers who could take over the garden activities if necessary. I made the observation that at each school there were at least several school teachers involved in the running of the vegetable garden. Some schools had several teachers involved while other schools only had one teacher as the primary organiser and supervisor. At four of the five schools we visited the principal, in addition, to the teachers was involved, while the first school we visited there was only one committed teacher involved who received limited help from the rest of the teachers, but did receive a large amount of support from the gardener. This teacher had no support from the school committee or the principal. My first assumptions before going to Port Elizabeth (PE) and viewing the vegetable gardens were that there would be committees of teachers who organised and maintained the vegetable gardens. My opinions were somewhat changed as one of the schools had no support, from internal members or	Seems to be that there is one teacher who takes charge and leads the initiative Committees involved which manages the gardens Provides support by there always being a few teachers who can step up and support the garden Level of commitment from teachers seems to be different at each school Teachers are organisers and supervisors of the gardens

external people. Due to the lack of involvement by teachers very few learners were involved in the garden, it seemed that the other teachers did not attempt to use the garden in their lessons or incorporate it into the curriculum in any form. The gardens that I thought looked the best and were flourishing were the gardens who had a support team maintaining them. Learners seem to be very active in the maintenance of the gardens, where they are watering, planting and weeding the gardens. Learners were very enthusiastic to take part in the gardens and even spent their break times attending to the garden. The teachers seem to take on a supervisory role in the maintenance of the gardens, where they organise and oversee the day to day goings on in the gardens. Gardens that are very successful seem to have a strong backing from the school principal, where they provide support, help with networking and acquiring funds. Teachers mentioned that some of the learners lived in poverty and that the garden would help these learners as the teachers would use the produce to feed the learners. The learners would also learn skills which they could then use at home to begin their own vegetable garden. The gardens were used to provide food to the school as well as used as a teaching resource so that learners could learn to plant, water and harvest produce. The teachers primarily involved in the gardens seemed to involve the learners, gardeners as well as other teachers and some community members. At one of the schools the teachers reported that two parents were involved in the maintenance of the garden. Schools with involved principals seemed to have successful vegetable gardens as they were receiving adequate support. The teachers also reported that when times were hard and they were struggling with the garden the principal would provide them	If teachers are not involved then few learners will not be involved Some teachers did not use the garden or integrate it into the school curriculum Learners are committed and involved, as they spend time in break times maintaining the garden, show willingness to be involved in the gardens Committed and involved principals contribute to the success of the gardens by providing support, networking with role-players and providing financial support Learners gain knowledge and skills when involved in gardens Garden = teaching resource Community members and parents involved Involved principals provide adequate and necessary support

with moral support and they would all get together (teachers, committee members and principal) in order to discuss what they could do to better the situation. One of the participating schools received no support from their school principal, the teacher commented that she had not even seen the principal visit the garden. I noticed the intense frustration this teacher felt and expressed when discussing her lack of support. In her case, she was the role-player with the dream and initiative to keep trying as she believed her garden could make a difference in the lives of her learners. I noted that the role of the principals was that of procurer of funds and support from other stakeholders. After visiting each school, I have come to the conclusion that one teacher cannot do everything alone, they need support from others, may it be the gardener, her learners or the principal. I also found that at schools where the principal was extremely involved or involved in some capacity more teachers were involved in the garden and were willing to provide additional support to the teachers already involved in the garden. I also noted that when many teachers were busy in the gardens there were quite a few learners wanting to help and get involved in the garden as well. The other schools had supportive teachers as well as principals and seemed to be thriving, and were able to ask for help and support. When discussing and asking questions about their experiences most of the teachers seemed to have positive memories and experiences associated with involving their learners. They mostly said that the only real disadvantage was that the learners often became too excited and enthusiastic, and this made them impatient to get the work done in the garden. Across the five schools I visited there seemed to be quite a varied mix of role-players who were involved in the gardens. Reflecting back on my initial thoughts before I started my study I had just assumed that each school would have similar role-	Principal mobilises resources and encourages involvement of many role-players Challenge that some principals may not be involved at all Principal provides support and access to resources More teachers involved when the principal is involved Learners compliant and taking ownership of garden by getting involved and helping Challenge = learners need supervision

players involved in their gardens and that these role-players would play a similar role in the garden. I can confidently say that this assumption of mine was proved wrong after this last field visit, as I was truly exposed to the diversity of each schools' garden and how each school had a combination of different role-players involved in their gardens. There was not one "fixed" recipe of who to involve in order to have a successful garden. I was astounded at how each of the schools utilised the different role-players strengths and resources to the benefit of the garden and learners in different ways. I thought that each school showed a true sense of sustainability in how they adapted and adjusted to their varied circumstances, using what was around them in order to cope and keep their gardens thriving. Each garden was so different as each garden was set up and managed uniquely and in a way that was relevant to the specific school. Teachers seemed to manage the garden in a way which was sustainable and effective for their specific circumstances. I was truly amazed after leaving School I and seeing how incredible their garden was. The teacher who had established the garden was so passionate and so proud to show us what she had started. I found her enthusiasm for gardening and providing her learners with this sustainable food and learning resource as inspiring. After our discussion with her I truly began to grasp the notion that each of these gardens started with an individual who had a dream, a hope, a need to create a vegetable garden for their learners and for the school. A dream of creating a garden which could serve as a sustainable food source, all the while teaching learners how to create their own sustainable food source. I noticed how at each of the various schools the teachers who had the dream were extremely resourceful and willing to go out into the community to try and find resources and assets which they could use in order to make their garden a success. These teachers showed an unlimited	Teachers are the managers, supervisors of the gardens Individual with the dream of creating a garden and driving the initiative Learners personally benefitting Teachers being innovative and resourceful and

amount of willingness to provide support so that their vision of a garden could be realised. I also identified that in many of the schools it was the initial teacher with the dream who reached out to involve other role-players in their gardens. They made the effort to make create networks between role-players. I found that teachers mostly expressed having positive experiences when involving their learners, and that by involving the learners there were many benefits for the learners personally and for the garden. The teachers seemed to hold the belief that by involving the learners they learned many essential skills which they hopefully would use in the future. The garden was therefore not just a tool which would influence the learners in the present, but which would provide them with skills and knowledge which they could use in the future to better their lives. I also noted that the teachers often discussed how the learners also taught them a lot in the gardens and that it was not just a useful learning tool for the learners but also acted as a learning tool for the teachers. Again, I was surprised at how little parents participated in the maintenance of the gardens. For some reason I had a strong opinion from the beginning of my study that parents would be actively involved. I did note that the teachers wished that parents would take more of an active role in their gardens, but that the teachers understood that it was difficult for parents to be actively involved for numerous reasons, for example, parents living far away and not being able to get transport to schools.	using what is available to address challenges and make their garden a success Benefit of involving teachers, may be very involved and willing to provide support to other role-players Teachers mobilising other role-players Many benefits associated with involving role-players, learners gain essential skills Knowledge and skills acquisition Teachers also learning Lack of involvement by parents

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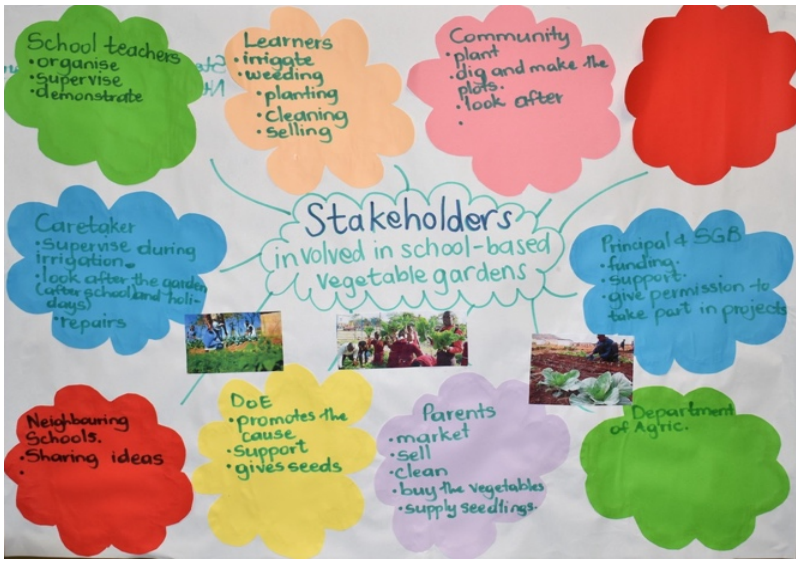
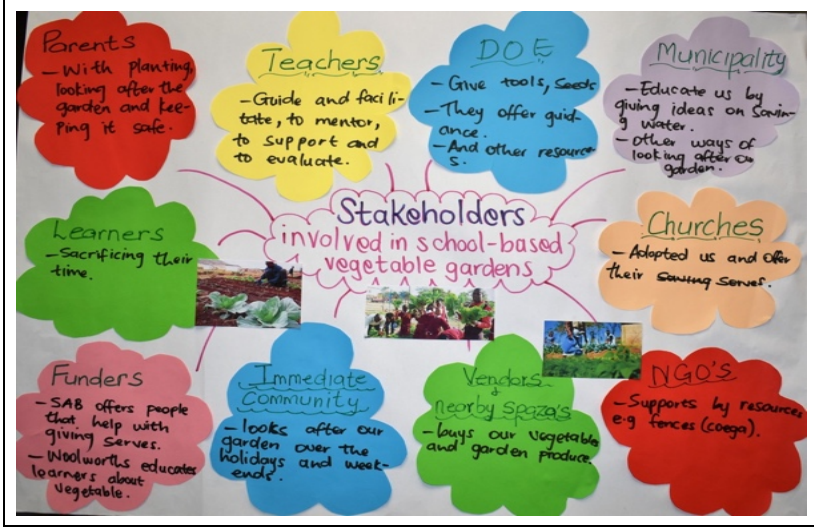
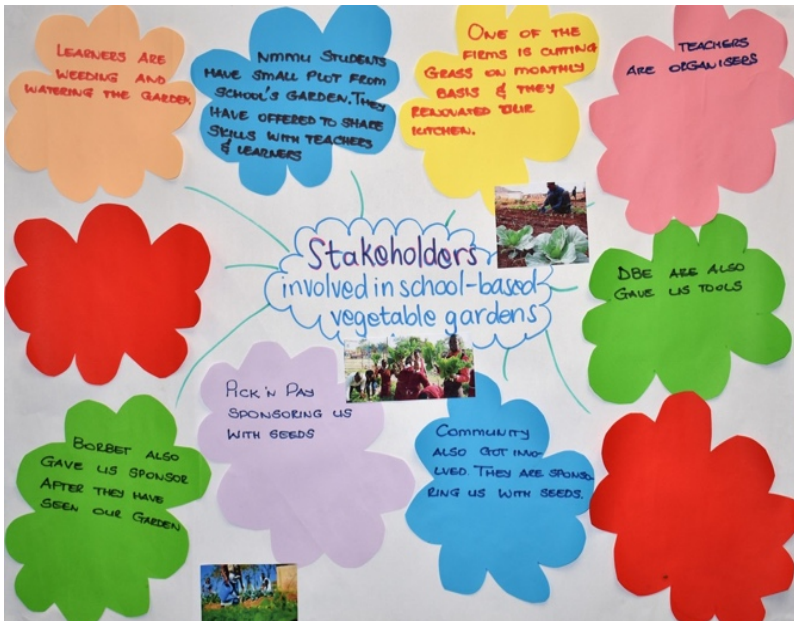
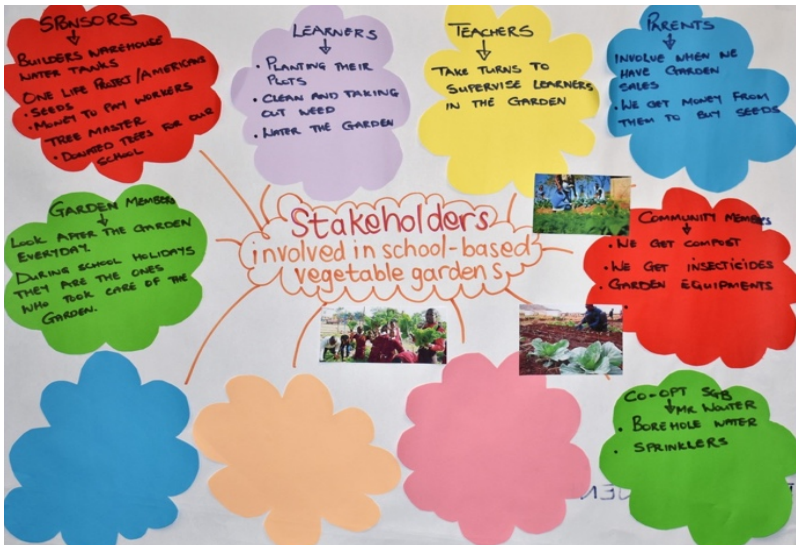
APPENDIX E: Visual data

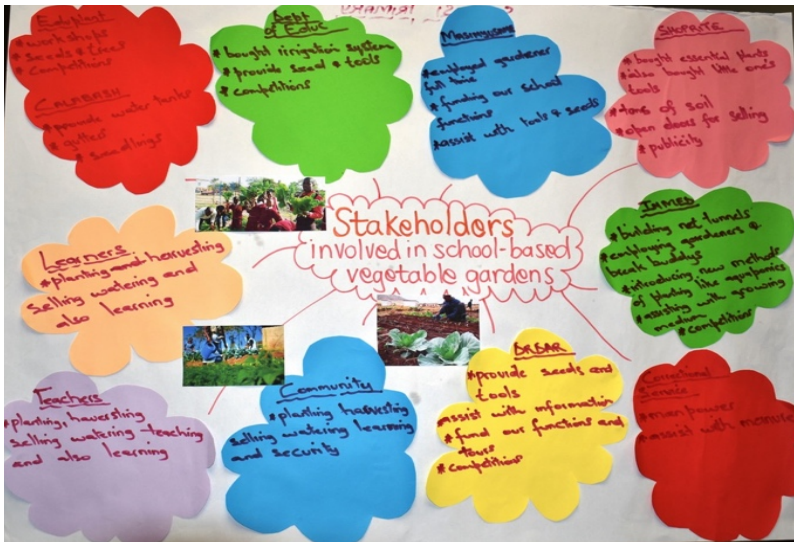
- E1 – PRA-matrices
- E2 – Pictures taken during PRA-based workshop (*to be reviewed on the CD-ROM*)

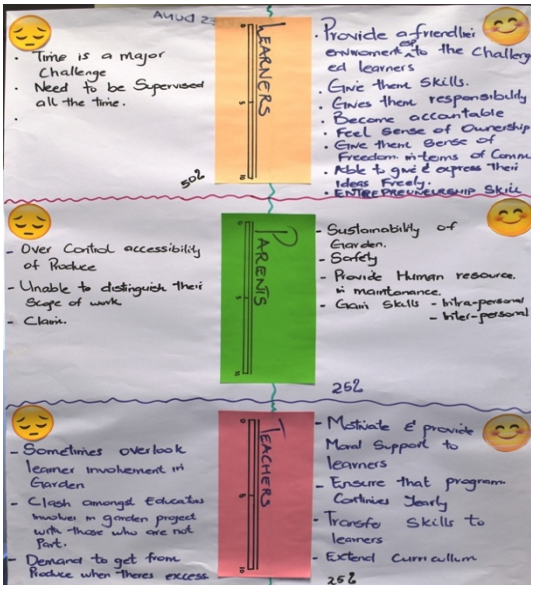
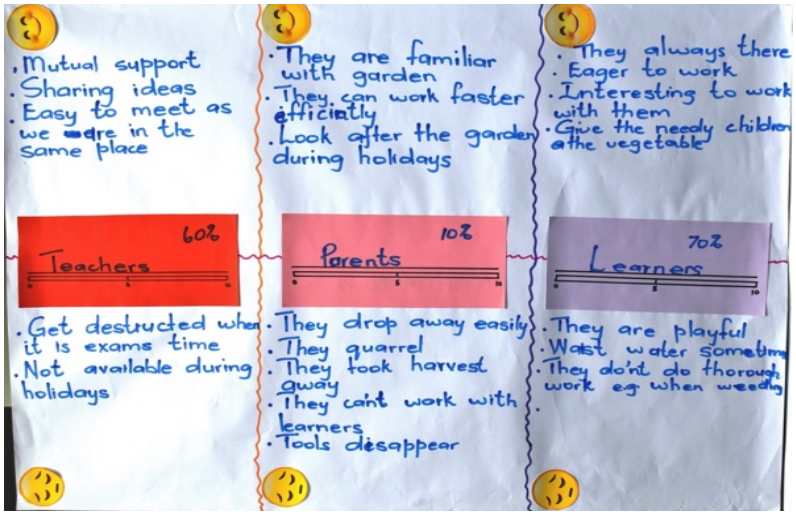
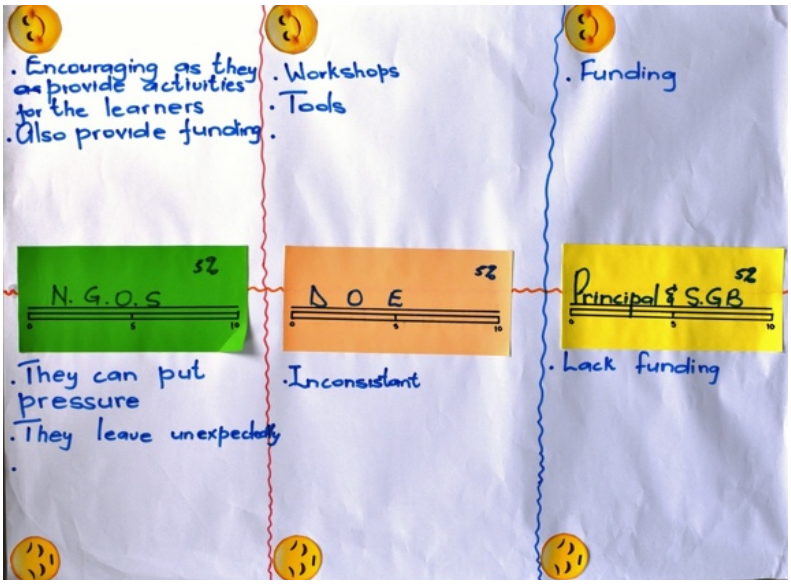
PRA activity 1	
School A – Poster 1	
	Role-players involved: • Learners • Teachers • Community • Government department • Tourists • Principal • Institutions of higher learning • NGOs
School B and C – Poster 3	
	Role-players involved: • School teachers • Learners • Community • Caretaker • Principal and SGB • DoA • Parents • DoE • Neighbouring schools • Caretaker
School D – Poster 8	
	Role-players involved: • Parents • Teachers • DoE • Municipality • Churches • NGOs • Vendors and nearby spaza shops • Immediate community • Funders • Learners

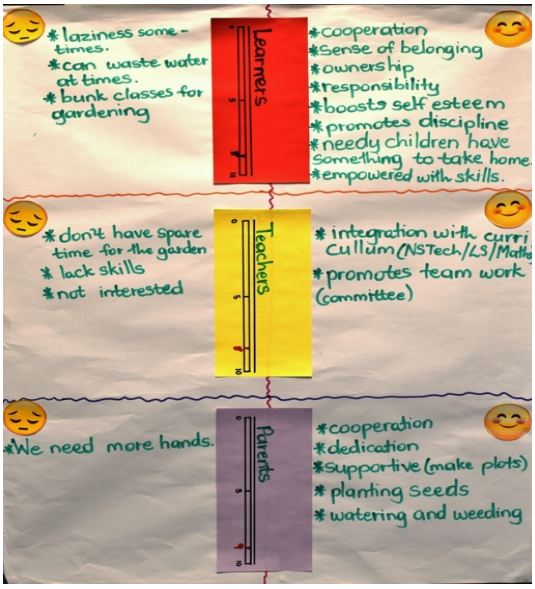
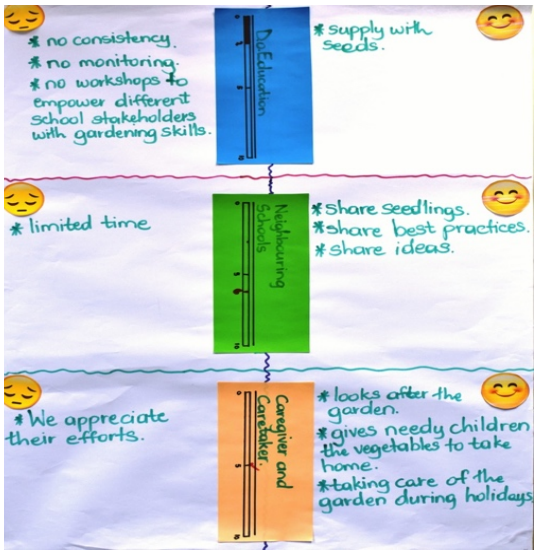
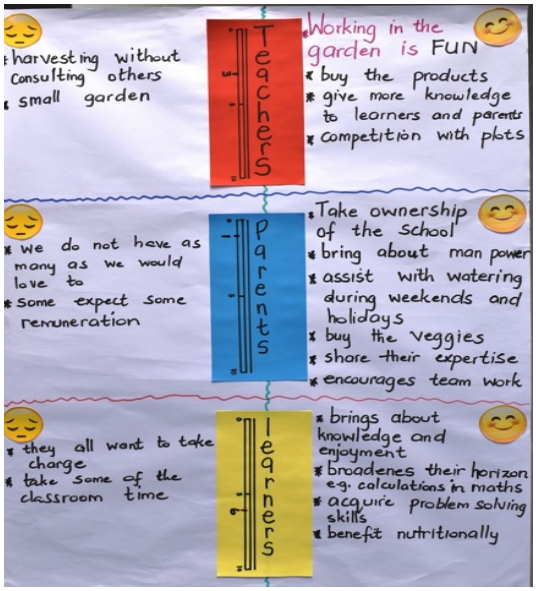
School E – Poster 10	
	Role-players involved: • Funders • Learners • Teachers • Parents • NGOs • Department of Education • Municipality • Churches • Community • Gardener
School F – Poster 12	
	Role-players involved: • Learners • Nelson Mandela University students • A firm • Teachers • DBE • Community • Pick 'n Pay • Borbet
School G – Poster 14	
	Role-players involved: • G.M. Foundation • Gardener • Learners • Volkswagen (VW) • School caretaker • Community group • Class teacher • Masifunde • NMMU

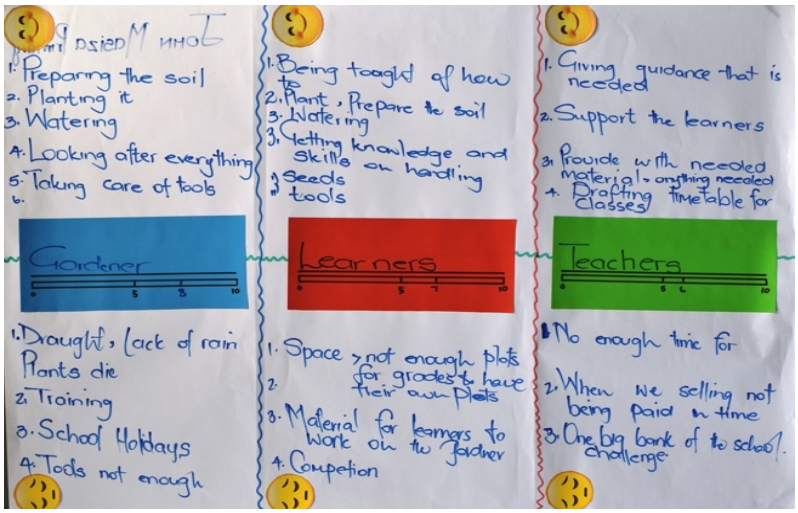
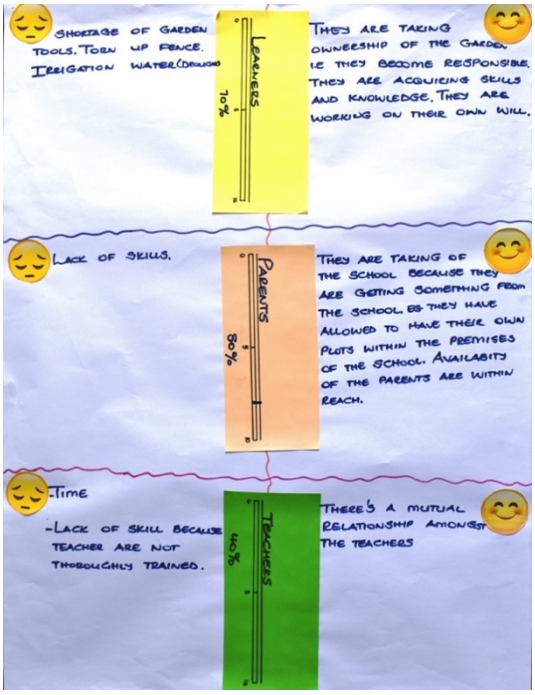
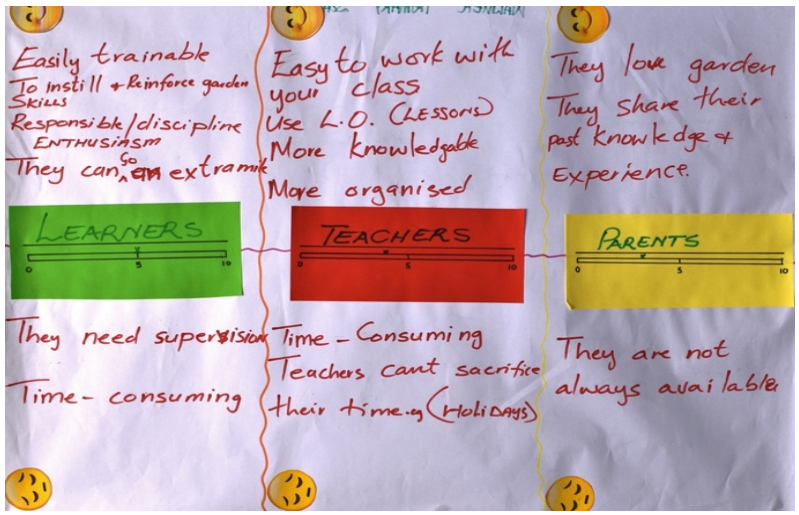
School H – Poster 17	

	Role-players involved:
	• Sponsors
	  ○ Builders Warehouse
	  ○ One Life Project
	  ○ Tree master
	• Learners
	• Teachers
	• Parents
	• Community members
	• Co-opt SGB
	• Garden members

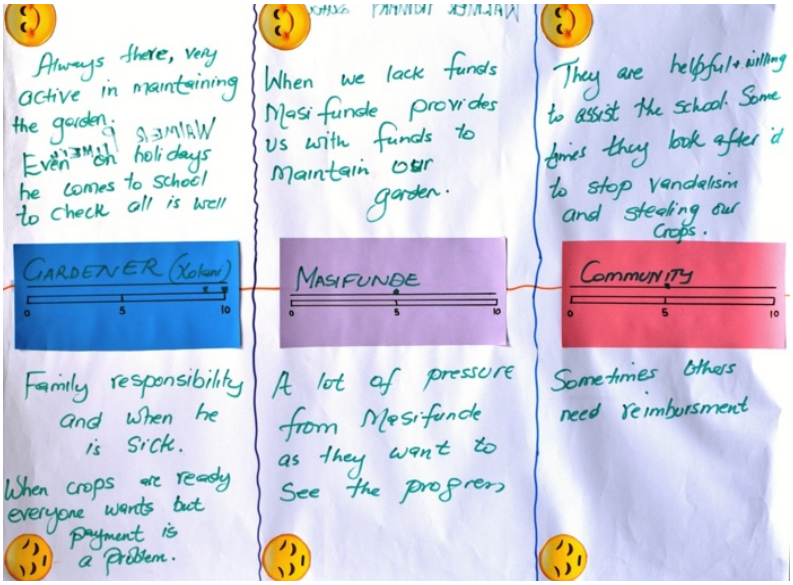
School I – Poster 19	
	Role-players involved: • EduPlant • Calabash • Department of Education • Masimyusame • Shoprite • Inmed • Correctional services • DRDAR • Community • Teachers • Learners

PRA activity 2	
School A – Poster 2	
	Learners • Develop skills • Need to be supervised Parents • Gain skills • No scope of work Teachers • Motivated and provide support • Overlook learner involvement
School B – Poster 4	
	Teachers • Share ideas • Not available during school holidays Parents • Look after garden during the holidays • They drop away easily Learners • Eager to work • Waste water
School B – Poster 5	
	NGOs • Provide funding • Leave unexpectedly DoE • Provide tools • Inconsistent Principal & SGB • Provide funding • Lack funding

School C – Poster 6	
	Learners • Cooperate • Waste water Teachers • Promote teamwork • Lack skills Parents • Supportive (have their own plots) • Not involved as much as teachers would like
School C – Poster 7	
	DoEducation • Supply with seeds • No monitoring Neighbouring schools • Share seedlings • Limited time Caregiver and caretaker • Look after the garden • Teachers appreciate their efforts
School D – Poster 9	
	Teachers • Give knowledge to the learners • Harvest without consulting others Parents • Take ownership of the garden • Not enough parents involved Learners • Benefit nutritionally • They want to take charge

School E – Poster 11	
	Gardener • Prepare the soil • Do not have enough tools Learners • Plant, prepare the soil • Not enough space Teachers • Support the learners • No time
School F – Poster 13	
	Learners • Take ownership • Tear up fences Parents • Are available • Lack skills Teachers • Mutual relationship amongst teachers • Lack skills
School G – Poster 15	
	Learners • They go the extra mile • Need supervision Teachers • More knowledge and organised • Teachers cannot sacrifice their time Parents • They share knowledge and experience • Not always available

School G – Poster 16

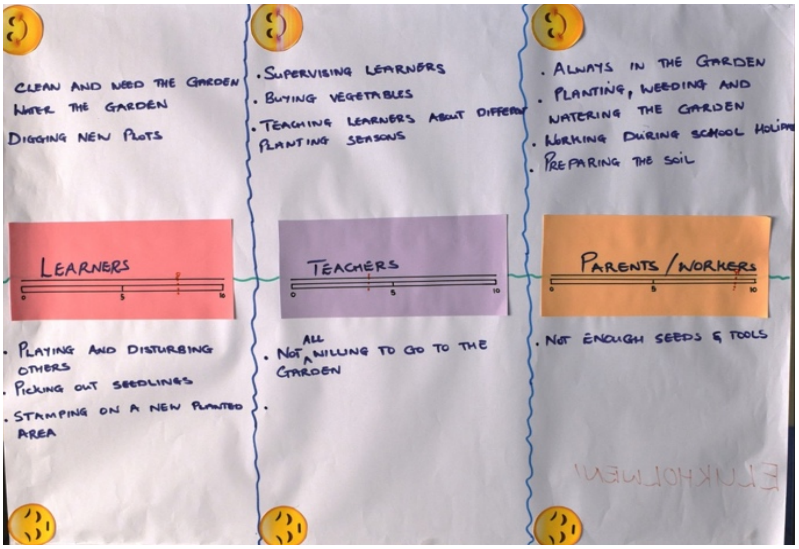


Gardener
- Always there maintaining the garden
- Cannot always be available

Masifunde
- Provides funds
- Pressure teachers for results

Community
- Helpful and assist school
- Need reimbursement

School H – Poster 18



Learners
- Clean and weed the garden
- Play and disturb others

Teacher
- Supervise the learners
- Not all teachers willing to go to the garden

Parents/workers
- Always helping
- Not equipment

School I – Poster 20

Learners
- They help maintain the gardens
- Need supervision

Teachers
- Gain knowledge
- No time for the garden

Community
- Providing support and security
- Stubborn to change

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APPENDIX F: INDUCTIVE THEMATIC ANALYSIS

The way in which I conducted inductive thematic analysis can be reviewed on the CD-ROM.

APPENDIX G: Inclusion and exclusion criteria

- G1: Inclusion and exclusion criteria for Theme 1
- G2: Inclusion and exclusion criteria for Theme 2
- G3: Inclusion and exclusion criteria for Theme 3
- G4: Inclusion and exclusion criteria for Theme 4

G1: Inclusion and exclusion criteria for Theme 1

Table G-1: Inclusion and exclusion criteria for Theme 1

Theme/Sub-theme	Inclusion criteria	Exclusion criteria
Theme 1: Potential role-players and their responsibilities	All data related to teachers' experiences of involving various role-players and their related responsibilities in their school-based vegetable gardens.	All data not related to the different role-players and their respective responsibilities, e.g. data referring to benefits and challenges of the involvement.
Sub-theme 1.1: School-based staff members	All data referring to the involvement of school-based staff members in school-based vegetable gardens.	All data referring to the involvement of learners, their parents, other community members and external stakeholders.
Sub-theme 1.2: Learners, parents and community members	All data related to the involvement of learners, parents and other community members.	All data referring to school-based staff members, and external stakeholders.
Sub-theme 1.3: External stakeholders	All data related to involving external stakeholders in school-based vegetable gardens.	All data related to the involvement of school-based staff members, learners, their parents and other community members in school-based vegetable gardens.

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G2: Inclusion and exclusion criteria for Theme 2

Table G-2: Inclusion and exclusion criteria for Theme 2

Theme/Sub-theme	Inclusion criteria	Exclusion criteria
Theme 2: Benefits of involving various role-players in school-based vegetable gardens	All data related to teachers' experiences of the benefits of involving various role-players in school-based vegetable gardens.	All data related to teachers' experiences of the factors supporting success of school-based vegetable gardens.
Sub-theme 2.1: Knowledge and practical skills acquisition	All data related to knowledge and skills acquisition as a result of being involved in school-based vegetable gardens.	All data referring to personal development, access to support and resources, or positive outcomes in terms of sustainability due to the involvement in school-based vegetable gardens.
Sub-theme 2.2: Personal development	All data related to personal development and growth due to the involvement of role-players in school-based vegetable gardens.	All data related to knowledge and skills acquisition, access to support and resources, and positive outcomes in terms of sustainability due to the involvement in vegetable gardens.
Sub-theme 2.3: Access to resources and support	All data related to having access to resources and support due to the involvement in school-based vegetable gardens.	All data related to knowledge and skills acquisition, personal development, and positive outcomes in terms of sustainability due to the involvement of various role-players in gardens.
Sub-theme 2.4: Positives outcome in terms of sustainability	All data referring to positive outcomes in terms of the sustainability of school-based vegetable gardens due to the involvement of various role-players.	All data related to f knowledge and skills acquisition, personal development, and access to support and resources due to the involvement in vegetable gardens.

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G3: Inclusion and exclusion criteria for Theme 3

Table G-3: Inclusion and exclusion criteria for Theme 3

Theme/Sub-theme	Inclusion criteria	Exclusion criteria
Theme 3: Factors supporting the success of sustainable school-based vegetable gardens	All data related to teachers' experiences of factors that may support the success of sustainable school-based vegetable gardens.	All data relating to teachers' experiences of factors that do not support the success of sustainable school-based vegetable gardens, or to the advantages and challenges of involving different role-players.
Sub-theme 3.1: Dedicated person driving the initiative	All data related to teachers' experiences of dedicated individuals as core to the success of school-based garden initiatives.	All data related to teachers' experiences of role-players implementing innovative plans, developing solutions to encountered problems and displaying commitment and ownership.
Sub-theme 3.2: Commitment, support and ownership by those involved	All data relating to teachers' experiences of role-players displaying commitment, support and ownership of their school-based garden responsibilities.	All data related to teachers' experiences of role-players implementing innovative plans, developing solutions to encountered problems and being dedicated.
Sub-theme 3.3: Implementing innovative plans and solutions to problems	All data related to teachers experiences of role-players implementing innovative plans and developing solutions to problems.	All data related to teachers' experiences of role-players being dedicated and displaying commitment and ownership in their school-based vegetable garden responsibilities.

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G4: Inclusion and exclusion criteria for Theme 4

Table G-4: Inclusion and exclusion criteria for Theme 4

Theme/Sub-theme	Inclusion criteria	Exclusion criteria
Theme 4: Challenges associated with the various role-players	All data related to teachers' experiences of challenges associated with the involvement of various role-players in school-based vegetable gardens.	All data related to teachers' experiences of challenges which cannot be associated with the involvement of other role-players in school-based vegetable gardens.
Sub-theme 4.1: Environmental and resource-related challenges	All data related to teachers' experiences of environmental and resource-related challenges.	All data relating to teachers' experiences of time-related challenges and a lack of commitment, compliance and involvement by role-players.
Sub-theme 4.2: Limited involvement, compliance and commitment by role-players	All data referring to the challenge of limited involvement, compliance and commitment by role-players in school-based vegetable gardens.	All data related to time-related, environmental and resource-related challenges when involving various role-players in school-based vegetable gardens.
Sub-theme 4.3: Time-related challenges	All data related to time-related challenges when involving different role-players in school-based vegetable gardens.	All data referring to teachers' experiences of environmental and resource-related challenges and a lack of commitment, compliance and involvement by role-players.

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APPENDIX H: Literature control

Table H-1: Comparison of existing literature to results of the current study

Theme	Main finding	Existing literature	Relation with existing literature
Theme 1: Potential role-players and their responsibilities	**Sub-theme 1.1:** School-based staff members can support the establishment and maintenance of vegetable gardens at school.	• Department of Planning, Monitoring and Evaluation & DBE, 2016 • Mawela & Van den Berg, 2018 • Rendall-Mkosi et al., 2013	Support existing literature
		• Departments of Health and Basic Education, 2012	Silences in the data when compared to existing literature
	Sub-theme 1.2: Learners, parents and community members can play a significant role in the establishment and maintenance of school-based vegetable gardens.	• Cilliers et al., 2018 • DBE, 2015 • Departments of Health and Basic Education, 2012 • Department of Planning, Monitoring and Evaluation & DBE, 2016 • Oldewage-Theron et al., 2018 • Rendall-Mkosi et al., 2013	Support existing literature
		• DBE, 2015 • Rendall-Mkosi et al., 2013	Contradict existing literature
	Sub-theme 1.3: External stakeholders can contribute to the establishment and maintenance of school-based vegetable gardens by providing resources and support.	• DBE, 2015 • Food and Trees for Africa, n.d.	Support existing literature
		• Departments of Health and Basic Education, 2012 • Department of Planning, Monitoring and Evaluation & DBE, 2016	Contradict existing literature
Theme 2: Benefits of involving various role-players in school-based vegetable gardens	**Sub-theme 2.1:** Role-players involved in school-based vegetable gardens can gain knowledge and skills as a result of being involved.	• Burt et al., 2017 • Laurie et al., 2017 • Mawela & Van den Berg, 2018 • Pourias et al., 2016 • Shimpo et al., 2019	Support existing literature
	Sub-theme 2.2: Personal development can occur as a result of role-players being involved in school-based vegetable gardens.	• Al-Mayahi et al., 2019 • Lucke et al., 2019 • Johnson & Duffek, 2008	Support existing literature
	Sub-theme 2.3: By involving various role-players access to various	• DBE, 2015 • Burt et al., 2017 • Lucke et al., 2019 • Pourias et al., 2016	Support existing literature

Theme	Main finding	Existing literature	Relation with existing literature
	resources and forms of support may be possible.	• Shimpo et al., 2019	
	Sub-theme 2.4: Role-players can contribute to the sustainability of school-based vegetable gardens in various ways.	• Collective School Garden Network, 2015b	Support existing literature
Theme 3: Factors supporting the success of sustainable school-based vegetable gardens	**Sub-theme 3.1:** A dedicated person driving a school-based garden initiative is key to the success of a sustainable garden.	• Collective School Garden Network, 2015b • DoE, 2009 • FAO, 2005 • Mawela & Van den Berg, 2018 • Rendall-Mkosi et al., 2013	Support existing literature
	Sub-theme 3.2: Committed, supportive role-players who take ownership of school-based vegetable gardens contribute towards the success of the gardens.	• Collective School Garden Network, 2015b • Departments of Health and Basic Education, 2012 • Mawela & Van den Berg, 2018	Support existing literature
	Sub-theme 3.3: Implementing innovative plans and solutions to problems can result in less challenges and improved sustainability of school-based vegetable gardens.	• Collective School Garden Network, 2015a, 2015b 2015c • Johnson & Duffek, 2008	Support existing literature
		• Collective School Garden Network, 2015a, 2015b • Qila & Tylio, 2014	New insight
Theme 4: Challenges associated with the various role-players	**Sub-theme 4.1:** Environmental and resource-related challenges can affect the way in which various role-players fulfil their roles and responsibilities.	• Al-Mayahi et al., 2019 • Cilliers et al., 2018 • Department of Planning, Monitoring and Evaluation & DBE, 2016 • Laurie et al., 2017 • Qila & Tylio, 2014 • Rendall-Mkosi et al., 2013	Support existing literature
	Sub-theme 4.2: Limited involvement, compliance and commitment are challenges associated with various role-players involved in school-based vegetable gardens.	• Department of Planning, Monitoring and Evaluation & DBE, 2016 • Laurie et al., 2017 • Mawela & Van den Berg, 2018 • Rendall-Mkosi et al., 2013	Support existing literature
	Sub-theme 4.3: Time-related challenges may limit role-player involvement and commitment, and negatively affect the success of school-based vegetable gardens.	• Collective School Garden Network, 2015b • Department of Planning, Monitoring and Evaluation & DBE, 2016 • Mawela & Van den Berg, 2018	Support existing literature

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