

Early Childhood Development as pathway to sustainable community development

By

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DECLARATION

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ABSTRACT

This study investigated the possibilities of early childhood development (ECD) as pathway to sustainable community development by means of a literature survey and practical research. The main objectives were to determine the usefulness of integrated, ecological ECD as entry point to sustainable community development, to determine how this might be achieved and to reflect on the benefits and limitations of sustainable community development through ECD.

A review of the literature emphasized the importance of ECD, as early childhood is foundational for the establishment of lifelong skills, knowledge, values and attitudes. The need to enhance capabilities for sustainable development from a young age is becoming increasingly urgent as the world braces itself for a future likely to be characterised by a 'global polycrisis' which includes climate change, resource depletion, poverty and food security. Integrated, ecological ECD exposes children to a worldview that acknowledges complexity and interdependence. This contributes to their ability to be agents of change that imagine and create alternative futures on community, national and global levels. Conceptualising ECD spaces as integrated ecological 'hubs' for sustainable community development is a way of enhancing community capabilities for sustainable development by facilitating synergies between various projects, promoting intergenerational learning and ensuring that children are central to all community development initiatives.

The practical research focused on the Lynedoch Crèche as a working example of an integrated, ecological ECD 'hub' for sustainable community development. The purpose of this case study was to contribute to the attainment of the research objectives by balancing theory with the intricacies of praxis. The main findings of the case study pertain to the need to inform ECD by a deeply ecological and integrated worldview that places children at the centre of sustainable community development. The importance of deriving context-specific methodologies and solutions that stem from an intricate knowledge of the socio-ecological environment was emphasized. The research indicated that the core challenges to this approach relate to capacity, leadership, financial viability and institutional arrangements.

The conclusions drawn from the literature survey and the practical research suggest a useful role for ECD as entry point for sustainable community development. I further conclude that there is no single conception of what an integrated, ecological hub for sustainable development might entail. Rather, these 'hubs' must be born from worldviews rooted in complexity and interdependence and an ecological educational paradigm that is inspired and informed by the local socio-ecological environment. The principle benefit to this approach relates to the fact that community capabilities for children-centred sustainable development are enhanced in concurrence with the high quality ecological education of its children. The greatest limitation of this approach is that its success hinges upon the capacity of teachers to fulfil multiple roles and provide leadership in largely uncharted territory.

OPSOMMING

Hierdie studie het die moontlikheid ondersoek dat vroeë kinder ontwikkeling (VKO) as ingangspunt vir volhoubare gemeenskapsontwikkeling gebruik kan word. 'n Literatuur-studie oor die onderwerp en praktiese navorsing by die Lynedoch kleuterskool is die kern van die studie. Die hoofdoel was om te bepaal of geïntegreerde en ekologies-georiënteerde kleuterskoolonderrig sinvol kan bydra tot volhoubare gemeenskapsontwikkeling, om te bepaal hoe dit bereik kan word, en wat die voordele en nadele van so 'n benadering is.

Die literatuurstudie het die belangrikheid van VKO as die fondament vir die vaslê van lewenslange vaardighede, kennis, waardes en houdings bevestig. Dit word al hoe dringender om kinders van 'n vroeë ouderdom af vir volhoubare ontwikkeling toe te rus sodat hulle leiding kan neem in 'n toekoms wat waarskynlik gekenmerk gaan word deur meervuldige krisisse soos klimaatsverandering, oorbevolking, uitputting van natuurlike hulpbronne, armoede en voedselskaarste. 'n Geïntegreerde- en ekologiese benadering tot VKO stel kinders bloot aan 'n wêreldsiening wat kompleksiteit en interafhanklikheid beklemtoon. Hierdie bewustheid help kinders om kreatief alternatiewe toekomsmoontlikhede raak te sien en te verwesenlik, tot voordeel van hul gemeenskap, land en wêreld. Kleuterskole kan geposisioneer word as een van die geïntegreerde spilpunte waarom gemeenskapsontwikkeling draai. Vaardighede vir volhoubare ontwikkeling word sodoende bevorder in beide kinders en gemeenskappe. Samewerking tussen verskeie projekte word aangemoedig, oud en jonk leer saam en kinders word 'n sentrale fokus van alle gemeenskapsontwikkelingsinisiatiewe.

Die praktiese navorsing is 'n gevallestudie van die Lynedoch Kleuterskool. Hierdie kleuterskool is gekies as 'n voorbeeld VKO wat poog om 'n geïntegreerde, ekologiese benadering te volg en om 'n rol te speel in volhoubare gemeenskapsontwikkeling. Die gevallestudie het die literatuurstudie aangevul deur moontlikhede en tekortkominge van 'n praktiese toepassing te demonstreer. Die bevindings bevestig die belangrikheid van 'n ekologiese- en geïntegreerde benadering tot VKO, en hoe noodsaaklik dit is om te verseker dat kinders as die sleutel tot gemeenskapsontwikkelingsinisiatiewe gesien word. Kennis van die unieke sosio-ekologiese konteks behoort te lei tot die ontwerp van geskikte onderrig metodes. Die gevallestudie dui daarop dat 'n tekort aan kapasiteit, onvoldoende leierskap, finansiële onselfstandigheid en swak organisasie dikwels van die grootste uitdagings is wat sukses belemmer.

Die gevolgtrekkings van beide die literatuurstudie en navorsing is dat geïntegreerde en ekologiese VKO wel 'n nuttige invalshoek kan wees vir volhoubare gemeenskapsontwikkeling. Dit blyk verder dat daar geen enkele universele model van geïntegreerde en ekologiese VKO is nie, en dat elke projek se leerinhoud en metodologie volgens eiesoortige konteks bepaal word. Wat wel belangrik is, is dat dié projekte gebou word op ekologiese wêreldsieninge wat kompleksiteit en interafhanklikheid benadruk. Die hoof voordeel van hierdie benadering is dat gemeenskapskapasiteit vir volhoubare gemeenskapsontwikkeling bevorder word terwyl kinders hoë kwaliteit ekologiese opvoeding ontvang. Die belangrikste beperking hierin is dat sukses grootliks afhanklik is van goed toegeruste

onderwysers wat verskeie rolle tegelyktydig kan vertolk, wat leierskap kan neem en wat alternatiewe maniere van doen kan demonstreer.

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LIST OF ACRONYMS AND ABBREVIATIONS

AI	Appreciative Inquiry
ANC	African National Congress
BATSA	British American Tobacco South Africa
CSD	Centre for Social Development
ECD	Early childhood development
EDTP SETA	Education, Training and Development Practice Sector Education Training Authority
EPWP	Expanded Public Works Programme
FAS	Foetal Alcohol Syndrome
FET	Further Education and Training
GHG	Greenhouse Gasses
HSRC	Human Sciences Research Council
IEA	International Energy Association
IPCC	Intergovernmental Panel on Climate Change
LDC	Lynedoch Development Company
LFS	Learning for Sustainability
MTSF	Medium Term Strategic Framework
NGO	Non-governmental Organisation
NIP	National Integrated Plan
NPO	Non-profit Organisation
NQF	National Qualifications Framework
NSC	National Senior Certificate
OLF	OLIVE LEAF Foundation
SI	Sustainability Institute
QDA	Qualitative Data Analysis
UN	United Nations
WCED	Western Cape Education Department
WWF	World Wildlife Fund

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Chapter 1: Introduction

1.1 INTRODUCTION

Early childhood development (ECD) is widely recognised as the first step in the process of lifelong learning, development and growth (Heckman, 2006; Barnett & Ackerman, 2006; McCain, Mustard & Shanker, 2007). Experiences deeply felt by children are likely to be carried with them for the remainder of their lives (McCain, Mustard & Shanker, 2007; Pressoir, 2008). As children grow older, they will face a multiplicity of new and interrelated crises (also referred to as the 'global polycrisis' (Morin, 1999: 14) including climate change, population growth, rapid urbanization, increasing poverty and inequality, peak oil, resource depletion and food insecurity (Barbier, 2007; WWF, 2008; IEA, 2008; IAASTD, 2008; IPCC, 2009). Given that the future is characterised by uncertainty and complex challenges, it is vital to ensure that today's children, who are the leaders of tomorrow, are equipped with the necessary knowledge, values and attitudes to confront these challenges and to develop appropriate solutions (Orr, 1992; Orr, 1994; Davis et al., 2009; Le Grange, 2008; Stone, 2009; Sterling, 2009).

The global polycrisis can largely be attributed to a reductionist worldview that fails to appreciate the systemic interrelatedness of all forms of life (Capra, 1996; Morin, 1999). Within the dominant neo-liberal developmental paradigm, resource-intensive growth is promulgated as the principal driver of development, regardless of the environmental and social devastation that it is bringing about (Clayton & Radcliffe, 1996; Capra, 1996; Morin, 1999). Several developmental alternatives, such as sustainable development and the 21st century developmental state (Sen, 1999; Evans, 2007; Swilling & Annecke, forthcoming) are becoming mainstream. A change in the course of development will, however, call for a worldview that is rooted in an understanding of complexity, transdisciplinarity, the interdependence of all life and systems thinking (Clayton & Radcliffe, 1996; Macy & Young-Brown, 1998).

To many it appears that mainstream education is failing to teach children alternative ways of thinking and doing. The unquestioned acceptance of a reductionist worldview, and the incongruity between the content of education and global realities, ultimately serve to perpetuate the thinking and doing that is causing the global polycrisis to begin with (Orr, 1992; Orr, 1994; Morin, 1999; Irwin, Siddiqi & Hertzman, 2007; Stone, 2009). While it is clear that there is no single solution to these challenges, an integrated, ecologically orientated approach to early childhood development may be one way in which young children could develop a grounded understanding of complexity and of their place within the web of life (Ball, 2005; Hornby, 2005). ECD centres could become 'hubs' for sustainable community development while ecological learning enhances capabilities for sustainable development in both young children and community members.

This study examines possible ways in which ECD can contribute toward sustainable community development. The theoretical argument set out in the literature review (Ch. 2) is supported by a detailed case study of the Lynedoch Crèche (Ch.3). The purpose of the case study is to ground the theory in the literature review in praxis, and to explicate the learning experiences of the Lynedoch

crèche in its endeavour to demonstrate an integrated, ecological approach to ECD within the wider context of poverty and development in South Africa.

1.2 MOTIVATION AND SIGNIFICANCE

An increasing number of studies indicate a likelihood that the global polycrisis is more threatening than we prefer to acknowledge, and that the effects thereof will hit closer to home than we would like to imagine (see, for example, the findings in the following reports: IPCC, 2007; WWF, 2008; IEA, 2008; IAASTD, 2008). Realising that it is predominantly my generation and the next that will have to negotiate these all-encompassing changes in the world as we know it, I am driven by a sense of urgency and purpose to imagine and create alternative futures. Within the paradigm of sustainable development, a strong emphasis is placed on intergenerational justice (see, for example, the well known WCED definition of sustainable development¹), yet, relatively little attention is given to ways in which young children should or could be prepared for this future (Orr, 1992; Davis, 1998). Moreover, it seems that little thought is given to ways in which children can actively contribute to and partake in the movement towards alternative futures. My hope is that this study will open the door for further discussion about the ways in which children can be central in the movement toward sustainable development.

My interest in this subject was sparked by a series of conversations with my supervisor, Eve Annecke, and my subsequent involvement with the OLIVE LEAF Foundation. Eve Annecke is a co-founder of the Lynedoch EcoVillage and the founding director of the Sustainability Institute, which is situated in the Lynedoch EcoVillage. From inception, the Lynedoch EcoVillage was designed as an approach to children-centred sustainable community development (Swilling & Annecke, 2006). Together with the baby centre, the Lynedoch Primary School, and the youth club, the Lynedoch Crèche forms part of the endeavour to create alternative futures for the children at the Lynedoch EcoVillage.

The OLIVE LEAF Foundation² is a non-governmental organisation with the vision of ‘enabling sustainable communities’ that works in 8 different sites across South Africa and in 5 other African countries (Botswana, Zambia, Nigeria, Kenya and Cote D’Ivoire). ECD is one of the focus areas of the OLIVE LEAF Foundation and the organisation is actively exploring ways in which their early childhood development programmes might contribute to the enablement of sustainable communities. The OLIVE LEAF Foundation and the Sustainability Institute entered into a partnership out of which emerged the need for research on the role that early childhood development might play in sustainable community development.

The OLIVE LEAF Foundation was gracious in offering me a scholarship to do the research, and Eve Annecke agreed to be my supervisor. In the design of the research, it was decided to capture, as a case study, the learning that has emerged from the Lynedoch Crèche’s endeavour to demonstrate integrated

¹ “sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987).

² For more information, please visit the website of the OLIVE LEAF Foundation at: www.olf.org.za

and ecological approaches to ECD within peri-urban areas in South Africa, and to provide theoretical underpinnings for this approach through a comprehensive review of contemporary literature.

The desired outcomes of this research are:

- To inform and supplement the ECD programmes and policies of the OLIVE LEAF Foundation, in the hope of improving the lives of African children.
- To document and support the efforts of the Sustainability Institute, the Lynedoch EcoVillage and the Lynedoch Crèche to demonstrate children-centred sustainable community development through integrated, ecologically orientated early childhood development.
- To facilitate reflexive learning on the part of the Sustainability Institute and the Lynedoch Crèche.
- To expand the limited research base of literature focussing on early childhood development and sustainable community development originating from the global south.
- To develop a practical research base that may benefit a multiplicity of organisations and individuals who might endeavour to enable sustainable community development, using ECD as entry point.
- To inspire and guide ECD practitioners, civil society organisations, governments, families and communities to imagine and work towards alternative futures for young children.

1.3 CLARIFICATION OF ROLES

This research has in many ways been a collaborative effort with many interests and overlapping responsibilities. I wish to clarify the roles and responsibilities of those involved as follows:

- 1) This research was conducted by me (Magdelien Spies) in partial fulfilment of an MPhil degree in Sustainable Development Planning and Management through the University of Stellenbosch, in partnership with the Sustainability Institute. The practical research for this study focuses on the Lynedoch Crèche, which is a project of the Sustainability Institute and is located in the Lynedoch EcoVillage.
- 2) This research was supervised by Eve Annecke. Eve Annecke is co-founder of the Lynedoch EcoVillage and founding director of the Sustainability Institute, which is situated in the Lynedoch EcoVillage. She played a vital role in the establishment of the crèche and continues to provide invaluable support and guidance to the crèche. She is also appointed extra-ordinary lecturer at the School of Public Leadership, University of Stellenbosch.
- 3) The OLIVE LEAF Foundation entered into a partnership with the Sustainability Institute whereby they jointly developed an NQF level 5 learner manual for sustainable community development. This research study was commissioned by the OLIVE LEAF Foundation with the purpose of informing and supplementing their ECD programmes and policies towards furthering their focus of 'enabling sustainable community development'. I am grateful to this organisation for a generous bursary that allowed me to conduct this study.

1.4 RESEARCH OBJECTIVES

The **research objectives** of this study are:

- 1) Determine whether ECD presents a useful entry point for sustainable community development.
- 2) Determine what an integrated, ecologically orientated approach to ECD might entail.
- 3) Reflect on the benefits and limitations of such an approach.

To achievement of these objectives, the following **research questions** are relevant:

- 1) Is ECD a useful point of entry for sustainable community development?
- 2) What might an integrated, ecologically orientated approach to ECD entail?
- 3) What are the benefits and limitations of using ECD as entry point for sustainable community development?

1.5 CLARIFICATION OF CONCEPTS

The following concepts are used in this study, and are defined below for clarity:

Early childhood development (ECD)

ECD is holistically defined by the Department of Education White Paper on Education and Training (South Africa, 1995: no page number) as “the processes by which children from birth to about 9 years grow and thrive – physically, mentally, emotionally, spiritually, morally and socially”. During my preliminary research, I found that policy and praxis tend to focus on pre- and postnatal child and maternal well-being, as well as the period from 5 to 9 years through pre-primary and primary education. The importance of the period from 2 and a half to 5 years is often neglected (Biersteker & Louw, 2006). In this research, I endorse the abovementioned definition, but place a strong focus on centre-based ECD for children aged 2 and a half to 5 years.

Sustainable Development (and sustainability)

“Improvement in the quality of life for all humans equitably, both intra and inter-generationally, within the context of the earth’s limited carrying capacity” (Schulschenk, 2010). Section 3.2 of Chapter 2 presents the theoretical foundations for this definition.

Community

In this study, ‘community’ is 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: 1). Different aspects of this definition may be emphasized according to the context. To accommodate these contextual differences, the term ‘community’ is flexibly employed in this study.

Community development

Community development is defined as a process that promotes human development by “empowering communities and strengthening their capacity for self-sustaining development” (Monaheng, 2000: 125). Community channels that promote solidarity and improve the social, economic and cultural well-being of residents are established (Yachkaschi, 2008).

Capabilities

The notion of ‘capabilities’ is taken from Amartya Sen’s capability approach which considers a person’s actual and potential achievements (Sen, 1999; Hodget, 2008). Capabilities, therefore, are determined by one’s ability to achieve: “capabilities [...] are notions of freedom, in the positive sense: what real opportunities you have regarding the life you may lead” (Sen, 1987: 36). Sen does not define and list required capabilities in a way that allows for a ‘check box’ approach to development. This study systematically attempts to develop an understanding of the capabilities required to enhance possibilities for ECD as pathway toward sustainable development.

Ecological learning

Ecological learning is an approach to education that seeks to enhance capabilities for sustainable development, which makes it possible for students to creatively imagine and create alternative futures. In the light of the global polycrisis, these capabilities relate to an understanding of the systemic interdependence of life, the urgency of the crisis, the root causes of the crisis and the development of a deep ecological consciousness (Orr, 1992; Davis, 1998; Le Grange, 2008).

Complexity theory and systems thinking

This study is grounded in the understanding that qualitative research investigates complex socio-ecological systems. Complexity theory and systems thinking are utilised as a theoretical framework to facilitate an understanding of these systems. For the purposes of this study, it appears that the best way to understand complexity is perhaps to examine the characteristics of complex systems as put forward by Cilliers (1998):

- 1) Complex systems consist of a large number of elements.
- 2) These elements interact in a dynamic way. The nature of the interactions change over time.
- 3) Interactions are fairly rich, which means that any element in the system influences, and is influenced by, many other elements.
- 4) Interactions are non-linear and therefore causes and effects are not proportional. Small causes can have large effects, and vice versa. This is a precondition for complexity.
- 5) Interactions usually have a short range, and elements interact mostly with those closest to them. Long distance interactions are possible and are facilitated by other elements.
- 6) There are many non-linear feedback loops, which can be positive (enhancing/stimulating) or negative (detracting/inhibiting).

- 7) Complex systems are open systems which interact with their environment. Because of this interaction, it is difficult to determine the scope of the system or to draw a boundary around the system.
- 8) Complex systems operate under conditions far from equilibrium. As soon as a system reaches a state of equilibrium, it dies. The energy that flows through the system keeps it alive.
- 9) Complex systems have a history. They co-evolve through time and their past is co-responsible for their present behaviour. This quality makes the description of systems radically contingent to its context and forgoes the possibility of making generalisations from a specific system.
- 10) No individual element has access to all information in the system. Each element can only respond to locally available information. Complexity therefore emerges as a result of the pattern of interaction between different elements.

1.6 OVERVIEW OF RESEARCH DESIGN AND METHODOLOGY

The research process and output has two main components.

The first is a comprehensive survey of contemporary literature. This was selected as the best strategy to familiarise myself with important current research in the fields of ECD, sustainable development, community development and ecological learning. Based on the insights gained from the literature survey I was able to develop a sound theoretical argument about the possibilities and limitations of ECD as pathway to sustainable community development. This argument is presented in the literature review (Chapter 3).

The second component is the practical research. The setting for this research is the Lynedoch Crèche, which is based in the Lynedoch EcoVillage near Cape Town. The purpose of this research was to gain insight into the practical realities of setting up and operating an integrated, ecological ECD hub. The research activities included participant observation, interviews, the study of documents, notes and archival records and an appreciative inquiry. The practical research is presented in the format of a descriptive case study (Chapter 4).

Qualitative Data Analysis (QDA) and sense-making theory was used to analyse data from the literature review and case study. This analysis is presented in a series of cross-cutting emerging themes (Chapter 5).

Conclusions from the literature review and the case study are drawn in Chapter 6, along with suggestions for further scholarship and brief recommendations.

1.7 ETHICAL CONSIDERATIONS

Studies that involve children risk overstepping ethical boundaries. I remained aware of this risk and took precautions to ensure the safety and well-being of children. These included:

- All contact with children took place in the presence of another adult – usually the principal or assistant teacher of the Lynedoch Crèche.
- Children were never questioned or interviewed for the purposes of the research.
- Due to my role as participant observer, I minimally interacted with children. I generally busied myself with helpful tasks, such as cooking or cleaning, which allowed me to observe without disrupting the daily routine.
- The research process did not impact children negatively in any way.

All information was legitimately obtained, with the formal consent of the parties involved. Interviewees consented to the use of a voice recorder. The transcript of the interview was given to the interviewee subsequent to the interview, allowing for any changes or omissions to be made.

I therefore foresee no ethical transgressions as a result of the process or output of the research.

1.8 THESIS OUTLINE

The thesis is structured in the following way (see figure 1.1 below):

Chapter 1 is an introductory chapter. Included in this chapter are the introduction, the motivation and significance of this study, a clarification of roles and responsibilities, the research objectives, clarification of concepts, an overview of the research design and methodology, and the outline of the thesis.

Chapter 2 explains in great detail the research design and methodology. Every aspect of the design, methodology and theoretical framework is motivated and justified.

Chapter 3 provides a comprehensive overview of contemporary literature relevant to this field of study, in order to formulate theoretical answers to the research questions (section 1.4).

Chapter 4 presents the practical research component in the form of a case study of the Lynedoch Crèche. The case study describes the Lynedoch Crèche, as well as the context in which it is embedded, in great detail. Learning points are illuminated throughout the case study.

Chapter 5 draws together the theoretical and practical research by presenting a series of cross-cutting themes that emerged from the analysis and interpretation of data, using techniques from qualitative data analysis and sense-making theory.

Chapter 6 concludes the study with a concise summary of the research findings as they relate to the research objectives set out in section 1.3. Suggestions for further study and a brief set of recommendations are included.

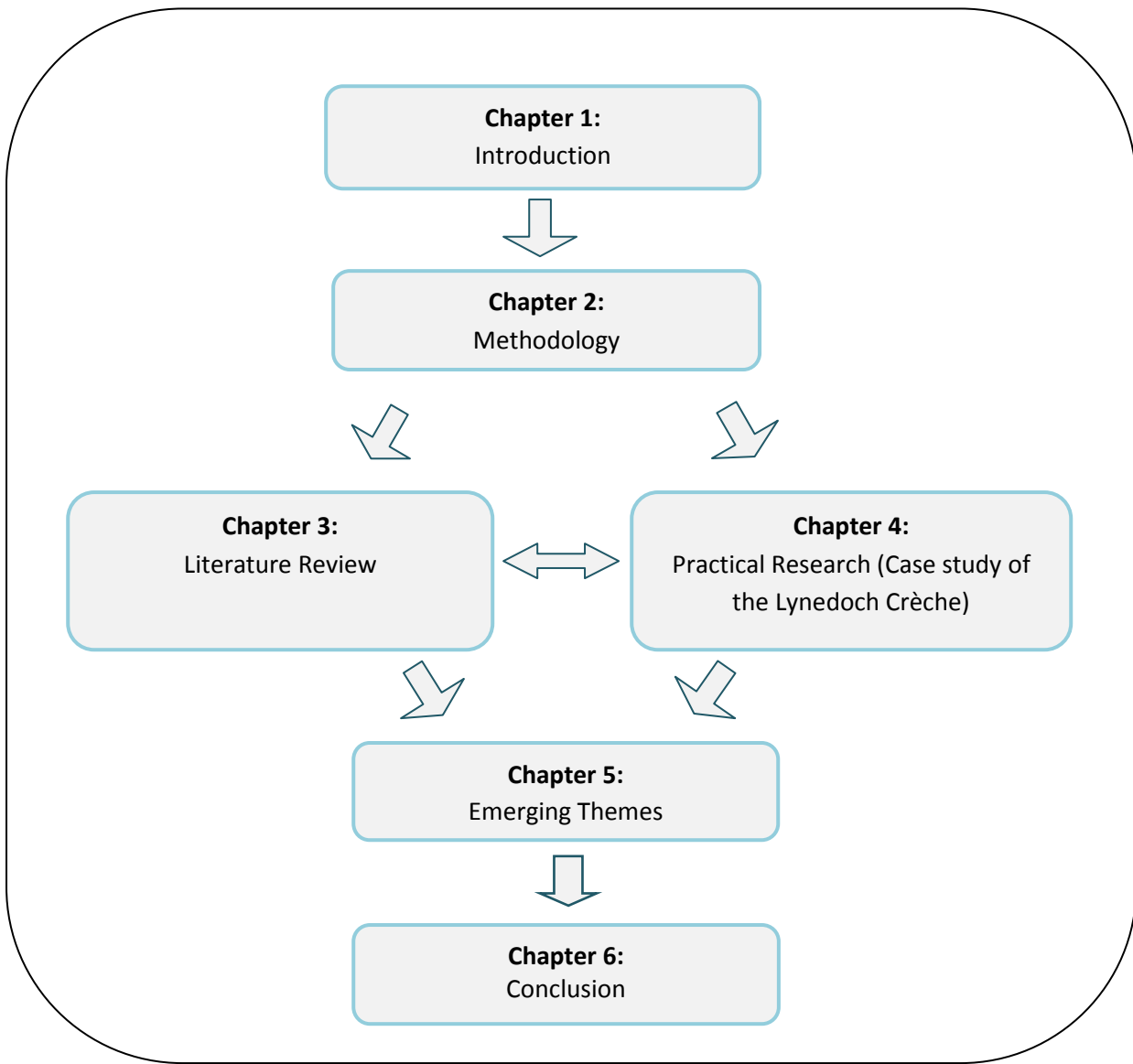


Figure 1.1: Structure of Thesis

Chapter 2: Methodology

2.1 INTRODUCTION

This chapter makes explicit the patterns of thought and investigation techniques employed in this study. The study is divided into two main components. The first is the literature review, where a theoretical argument is developed to support the research objectives. The second is the practical research, which is presented in the format of a case study. The purpose of the case study is to ground the theoretical argument made in the literature review in the praxis of authentic contextual experience. The combined findings of these two sections are analysed by means of a series of cross-cutting themes that emerged during the learning process. The analysis is grounded in complexity theory and systems thinking. Qualitative data analysis (QDA) and sense making theory are used as analytical tools.

2.2 LITERATURE REVIEW

A literature survey was selected as the most appropriate strategy to familiarise myself with important current literature in the fields of ECD, sustainable development, community development and ecological learning. Knowledge generated by the literature survey was used to formulate a sound theoretical argument that is in line with the 3 core research objectives. This is presented in the format of a literature review (chapter 2). Online academic research databases were the primary way in which scholarly articles were accessed. Additional literature was sourced from the J.S. Gericke Library (Stellenbosch University), as well as other libraries through inter-library loans. The subject librarian (Hanlie Strydom) was consulted a number of times. She assisted me with new research techniques and made me aware of additional literature that might be useful.

The literature search was guided by the main objectives of the study, namely to:

- 1) Determine whether ECD presents a useful entry point for sustainable community development.
- 2) Determine what an integrated, ecologically orientated approach to ECD might entail.
- 3) Reflect on the limitations of such an approach based on the findings of the literature review and the practical research.

The first part of the literature review sets the context by describing the current state of the world and the probable future that the world is heading towards if the status quo is maintained. This is the future that today's children will inherit. A number of internationally accepted documents were used to provide an overview of the global polycrisis (see below). Thereafter, I examined what I perceive to be the root of the problem, namely neo-liberal development and the modern world view. Finally, I examined the ways in which mainstream education is serving to perpetuate this problem.

- **The symptoms: the global polycrisis:** (main sources referenced: WCED, 1987; UNHDR, 1998; Morin, 1999; UNEP, 2007; IPCC, 2007; WWF, 2008; IEA, 2008; IAASTD, 2008; Barbier, 2009).
- **Getting to the core of the problem:** neo-liberal development and the modern world view: (main sources referenced: Sen, 1999; Morin, 1999; Cilliers, 2000a; Stiglitz, 2002; Rist, 2006; Bidwai, 2006; Backstrand & Ingelstam, 2006; Yachkaschi, 2008).
- **How mainstream education is perpetuating the problem:** (Main sources referenced: Orr, 1992; Orr, 1994; Davis, 1998; Le Grange, 2008; Sterling, 2009; Stone, 2009; Pearson & Degotardi, 2009).

As the symptoms of unsustainable development become increasingly apparent, a number of significant alternatives to neo-liberal development gain prominence. Two of the most important of these are sustainable development and the 21st century developmental state. I argue that sustainable community development will require an enhancement of capabilities for sustainable development. Literature for this section includes:

- **Sustainable Development:** (Main sources referenced: WCED, 1987; Mebratu, 1998; Dresner, 2002; Gallopin, 2003; Rogers, Jalal & Boyd, 2005; Backstrand & Ingelstam, 2006).
- **The 21st century developmental state:** (Main sources referenced: Evans, 2002; Swilling & Annecke, forthcoming; Dresner, 2002; Evans, 2007; Butler, 2010; Edigheji, 2010).
- **Enhancing capabilities for sustainable development:** (Main sources referenced: Swilling & Annecke, forthcoming; Dresner, 2002).

Thereafter, I explore the possibilities of ECD as entry point for sustainable community development, and reflect upon what this notion might entail (see objectives 1 and 2). For this purpose, I firstly discuss the importance of ECD; thereafter, I explore conceptions of ECD as an integrated, ecological hub for sustainable development. To this end, the concepts of 'integration' and 'ecological learning' are discussed in detail. Literature for this section includes:

- **The importance of ECD:** (Main sources referenced: Den Haan et al., 2004; Greenspan & Shanker, 2004; Heckman, 2006; McCain, Mustard and Shanker, 2007; Biersteker, Streak & Gwele, 2008; Pramling Samuelsson & Kaga, 2010).
- **Ecological learning in ECD:** (Main sources referenced: Feeney & Moravcik, 1987; Orr, 1992; Van der Ryn & Cowan, 1996; Davis, 1998; Fjørtoft & Sageie, 2000; Miller, 2002; Chilton, Chyatte, & Breaux, 2007; Irwin, Siddiqi & Hertzman, 2007; Hicks & Holden, 2007; Biersteker & Motala, 2008; Bell & Dymont, 2008; Littledyke, 2007; Herbert, 2008; Lamers, 2008; Louv, 2008; Birkeland, 2009; Hagglund & Pramling-Samuelsson, 2009; Stone, 2009; Sterling, 2009; Davis et al., 2009; Hacking, Barratt & Scott, 2010).

Finally, I briefly discuss the state of ECD in South Africa as a preface for the case study: Biersteker, Streak & Gwele, 2008; Gustafsson, 2010; Biersteker & Motala, 2008; Hornby, 2005; Department of Basic Education, 2009; Department of Education, 2010; Lotz-Sisitka, 2009.

2.3 CASE STUDY

2.3.1 Case study defined

The case study as research method is an empirical enquiry, which investigates contemporary phenomena in - depth and in context (Yin, 2008). Case studies predominantly employ a qualitative research approach, where the objective of the research is to gain a better understanding of social settings and the general human condition (Van der Merwe, 1996). The primary concern is not the verification of theories about human behaviour, but rather an improved understanding of social systems (Flyvbjerg, 2006). The research approach is often less structured, due to the complexity of the social setting and the need to follow cues as they emerge (Van der Merwe, 1996; Holliday, 2002; Yin, 2008).

Case studies are often criticized as a tool to promote scientific knowledge. One criticism is that context-specific cases are difficult to generalise. Underlying this critique is the outdated assumption that real scientific knowledge is constituted by general predictive theories and not practical, context-dependent knowledge (Holliday, 2002; Yin, 2008). Flyvbjerg (2006), however, purports that a lack of general or predictive epistemic theoretical constructions for the study of complex systems implies that context-dependent knowledge is the only reliable source of information.

Alternatively, it could be argued that the purpose of case studies is not to generalise across populations, as is the case with quantitative research, but rather to generalise to theoretical propositions (Yin, 2008). In this way, case studies explore unexpected or divergent relationships across cases, compare practical realities with theoretical assumptions and adjust existing theories. This aids and builds upon social theory in order to enhance its predictive and explanatory value (Modell, 2005; Yin, 2008; Levy, 2008).

Another criticism of case studies is that the scientific value is undermined because case studies embody an inherent tendency toward bias. Two reasons are cited for this criticism: a lack of rigour when it comes to research methodology, and a natural human tendency toward the verification of preconceived ideas (Flyvbjerg, 2006; Yin, 2008).

The case study remains a fairly contested research method, but within the academic debate there is acknowledgement of the relevance, significance and value of case-based qualitative research.

2.3.2 Selection of Case Study

The Lynedoch crèche was selected as case study for the practical research of this study with the goal of facilitating an understanding of the practical realities related to the effort of creating integrated, community-based models for ECD. Drawing from systematic observations in fifteen ECD centres in Stellenbosch and surrounding areas, I came to the conclusion that the Lynedoch Crèche is unique in its attempts to integrate early childhood education with sustainable community development. The crèche is situated at the heart of the Lynedoch EcoVillage, which provides numerous opportunities for both ecological learning and sustainable community building. It is one of a few Montessori-based crèches accessible to children from poor communities. There are many socio-economic challenges related to

this context, including one of the highest rates of Foetal Alcohol Syndrome (FAS) in the world (Viljoen et al., 2005; Gray et al., 2009; Giarelli et al., 2009). The Lynedoch crèche does not claim to have ‘the perfect model’ of ecological education or community development, but actively tries to create alternative futures amidst the intricacies of a violent social fabric, alcoholism, poverty, racism and many other challenges.

I was intrigued by the multiple layers of learning-by-doing in a context with very real developmental challenges. I set out to capture elements of this experiential learning that might be useful to encourage, guide and stimulate the imaginations of communities wanting alternative futures for their children. I also hoped to challenge my own perceptions about the Lynedoch Crèche and about the possibilities for ECD in South Africa. Finally, I intended for the literature generated from the case study to add to existing context-specific literature from the global south, as most literature which pertains to ecological learning, sustainable community development and early childhood development for sustainable community development that I have come across originates from, and is relevant to the global north.

The focus of the case study is in line with the research objectives. By examining the practical experiences of the Lynedoch Crèche, the findings from the literature review are supported to: i) determine whether ECD presents a useful entry point for sustainable community development; ii) determine what an integrated, ecologically orientated approach to ECD might practically entail; and iii) reflect on the benefits and limitations of such an approach.

2.3.3 Type of Case Study

I chose to conduct a single case study rather than to do a comparison of multiple case studies. I realize that a multiple case-study approach is beneficial, as it may enable broader generalisation and comparison through multiple reference points (Yin, 2008, Levy, 2008). My reasons for conducting a single case study as opposed to multiple case studies include:

- The compatibility of the Lynedoch Crèche with the theoretical argument set out in the literature review.
- The fact that the Lynedoch Crèche is (to my knowledge) somewhat unique in its approach and context.
- A personal conviction regarding the importance of documenting the history and efforts of the people involved at the Lynedoch Crèche.
- A limited time frame.

This is a descriptive or inductive case study. The aim of such a study is to:

Describe, explain, interpret and/or understand a single case as an end in itself rather than as a vehicle for developing broader theoretical generalisation [...] Inductive case studies are highly descriptive and lacking an explicit theoretical framework to guide the empirical analysis. These studies often take the form of “total history”, where everything is assumed to be connected to everything else and which consequently aims to explain all aspects of a case and their interconnections. (Levy, 2008:4)

2.3.4 Choice of research activities

In order to gain a rich and full understanding of the Lynedoch Crèche as an element within a wider ecosystem, the following research activities were pursued:

- 1) Interviews.
- 2) Participant observation.
- 3) Documents, notes and archival records.
- 4) Physical artefacts.
- 5) Appreciative Inquiry

Each of these research activities will now be discussed to convey the rationale behind their selection as research strategy, the reasons why they are appropriate and the protocol which will be followed.

2.3.4.1 Interviews

The case study relied heavily on personal interviews as a source of data³. The underlying assumption was that the people connected to the Lynedoch Crèche had an important voice and were experts regarding their own experiences (Theron & Saunders, 2009).

Interviews are mainly criticized for the possibility of information distortion due to interviewer bias that may be attributed to personal characteristics of the interviewer (such as perceived affiliation), race and gender effects, or the 'research selectivity effect' whereby the researcher has the power to utilize or ignore information according to his/her discretion (Mouton, 2001). Ways of overcoming these limitations include:

- An awareness of possible distortions of information.
- The utilisation of a diversity of research activities to ensure that interviews are not the sole source of information.
- Obtaining approval of the interview transcript from the interviewees.
- Including an objective third party in the interview to assist the researcher in transcribing and interpreting the interview (Mouton, 2001; Theron & Saunders, 2009).

I chose to record and transcribe each interview and send a copy of the transcript to the interviewee for approval.

Interview protocol

Unstructured interviews were selected for the people most intimately connected to the Lynedoch Crèche, as this type of interview allows space for the person interviewed to tell his/her story freely (Mouton, 2001; Theron & Saunders, 2009). The shortcomings of unstructured interviews include the

³ For a complete list of resource persons, their job descriptions, the type of interview used for each person and date of interview, please refer to Appendix A on page 120.

possibility of diverging from the topic of interest, and the fact that they are time-consuming (Theron & Saunders, 2009).

Semi-structured interviews were selected for interviewees who were indirectly connected to the crèche.

Structured interviews were conducted where a number of respondents answered a specific set of questions. This facilitated the comparison of answers.

2.3.4.2 Participant observation

Participant observation is defined as:

Studies which are usually qualitative in nature which aim to provide an in-depth description of a group of people or a community. Such descriptions are embedded in the life-worlds of the actors being studied and produce insider perspectives of the actors and their practices (Mouton, 2001: 100).

The researcher becomes an inter-subjective insider, and the conventional roles of researchers as experts and subjects as naive objects are reversed (Van der Merwe, 1996; Theron & Saunders, 2009).

The shortcomings of participant observation include a tendency towards bias and a possible decrease in the rigour of analysis. Because the researcher is embedded in the context and relationships are established, objective observation may be problematic (Mouton, 2001). It is useful to keep in mind that the goal is not to collect facts about human behaviour in order to prove or disprove certain theories, but to promote better self-understanding and increase insight into the human condition (Theron & Saunders, 2009).

I adopted the role of participant observer at the Lynedoch Crèche for two different periods of time during my research, and for a combined period of 14 days. My approach was relatively flexible, allowing me to follow cues where appropriate, with the intention of gaining as much knowledge and understanding as possible.

2.3.4.3. Documents, notes and archival records

The documents, notes and archival records studied include:

- Lynedoch EcoVillage code of conduct and design guidelines.
- The constitution of the Lynedoch Crèche.
- The 2010 financial statement of the Lynedoch Crèche.
- Funding proposals for ECD at Lynedoch.
- Crèche marketing brochures.

2.3.4.4 Objects and artefacts

Within the Lynedoch crèche there are many objects and artefacts of interest. Special attention was given to the learning space and the educational materials in use, especially in relation to their role in the

promotion of ecological education and sustainable community development. I was also interested in the sourcing of materials and the resources used to purchase or make the materials.

2.3.4.5 *Appreciative Inquiry*

An appreciative inquiry (AI) is a “strength based collaborative approach for study and change of reality” (Zandee & Cooperrider, 2007). It is a form of action research which celebrates that which is positive and excellent within a particular institution and builds upon those characteristics to improve and transform the institution. The life-giving elements of a human system are identified in a way that puts all actors in the centre of change and transformation (Ludema & Fry, 2007). This is a form of generative research, which is not value free but promotes a vigorous reference for life.

As researcher, I hoped to transcend my role of observing, interpreting and analysing in order to become a participating agent of change that is able to reinvest the knowledge gained into the Lynedoch Crèche. I chose to do so by offering to facilitate an appreciative inquiry as a tool to collaboratively deliberate on a way forward for the Lynedoch Crèche.

The process of an AI follows the “4 D” methodology, which is:

1) *Discover: What gives life to the organisation?*

In this section, the participants collaboratively identify the elements within the system that work excellently and that they are the most proud of. These elements then inform the strategic focus of the AI.

2) *Dream: What would the ideal organisation look like?*

Building on the strengths identified in the discovery phase, participants are encouraged to release their imagination and dream about the limitless potential of the organisation. They discover their vision for the organisation, which is imaginative yet grounded in reality.

3) *Design: What would the path toward the ideal organisation look like?*

In this phase, strategies are designed which would transform the organisation from its current state toward the ideal organisation. The design is co-constructed by everyone present and equal weight is given to all inputs.

4) *Destiny: Which inspired actions will support ongoing learning and innovation?*

The focus of this stage is usually on personal and organisational commitments toward alternative paths forward.

(Ludema & Fry, 2007)

2.3.4.6 *Feasibility*

The Lynedoch crèche was a feasible case study for several reasons.

1) **Access**

- i. *Physical site*: the physical site (the Lynedoch EcoVillage) was 14 km from my home in Stellenbosch. It was also walking distance from my office at the OLIVE LEAF Foundation and my academic base at the Sustainability Institute. I was granted free access to come and go as I pleased.
- ii. *Resource persons*: I had excellent access to all the resource persons needed for interviews. All resource persons were willing to participate in the research.
- iii. *Documents, notes and archival records*: I was able to access relevant documents, notes and archaic records by requesting them from resource persons or accessing them via the website of the Sustainability Institute (www.sustainabilityinstitute.net).
- iv. *Language*: all the resource persons spoke Afrikaans or English, and I am fluent in both languages.

2) **Financial viability**

Conducting the case study was financially viable since there were no additional costs involved besides my tuition fees. I am thankful to the OLIVE LEAF Foundation for granting me a bursary, which was enough to cover this cost.

3) **Time Allocation**

This study was conducted within a limited time frame. It is also important to bear in mind that the crèche was closed during school holidays. For the purposes of a MPhil thesis, however, this time frame was deemed sufficient.

2.4 ANALYSIS AND INTERPRETATION

The analysis of data refers to “‘breaking up’ data into manageable themes, patterns, trends and relationships” (Mouton, 2001: 108). Interpretation involves “the synthesis of one’s data into larger coherent wholes”. The data generated by this study is analysed and interpreted using qualitative data analysis (QDA) and sense-making theory to identify a set of cross-cutting themes. These themes are presented in Chapter 5. Throughout the study, I remained centred in complexity theory and systems thinking.

For qualitative data analysis (QDA) I selected a methodology proposed by Seidel (1998). Seidel puts forward three steps for the analysis of qualitative data: noticing, collecting, and thinking (see figure 2.1 below).

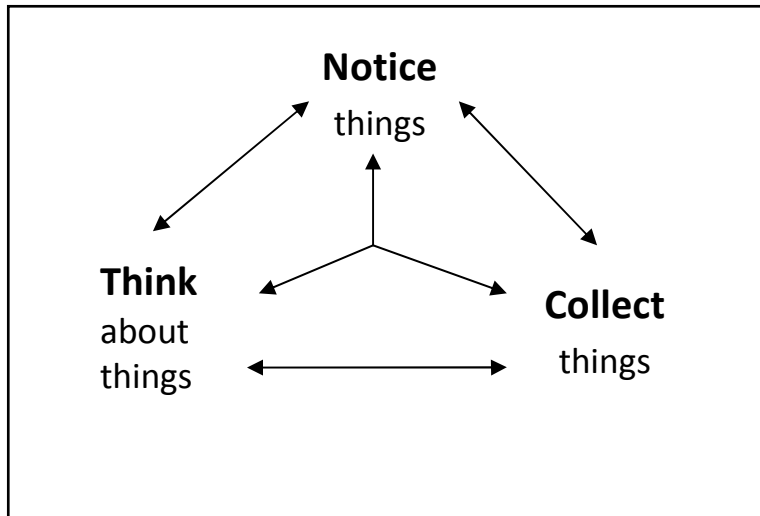


Figure 2.1: The three steps of qualitative data analysis
(Source: adapted from Seidel, 1998)

The three steps are discussed below:

- *Notice interesting things*

Noticing refers to observations, field notes, tape recording, interviews, readings, gathering documents and so forth. A record is produced of the things that were noticed. This record is then deeply studied, and new things that are noticed within these records are named, or 'coded'.

- *Collect interesting things*

The various codes that were identified in the previous section are then collected and sorted into categories or groups.

- *Think about interesting things*

In this step, the researcher examines the coded and sorted data, allowing cross-cutting themes to emerge. The researcher searches for patterns and relationship within and across collections and attempts to make general discoveries about the phenomena.

(Source: Seidel, 1998)

Seidel remarks that the process is non-linear, and has three important characteristics. Firstly, it is iterative and progressive, meaning the process has no clear beginning or end. Secondly, it is recursive, and finally, it is holographic, which means that each step in the process contains the entire process in itself.

In addition to QDA, sense-making theory is employed for the analysis and interpretation of data. According to Weick, Sutcliffe and Obstfeld (2005): "sense-making involves the ongoing retrospective development of plausible images that rationalize what people are doing" (2009: 409). Dervin further

adds that sense-making “seeks to find a way of thinking about diversity, complexity and incompleteness that neither drowns us in a tower of babel, nor imposes homogeneity, simplicity or completeness” (1998: 39). In his book *Sense Making in Organisations*, Weick (1995) proposes seven properties of sense-making:

- 1) It is grounded in the identity construction of the sense-maker.
- 2) It is retrospective of ‘meaningfully lived experiences’.
- 3) It is enactive of sensible environments (this emphasizes the importance of action in the process of sense-making, since people contribute to their environments).
- 4) It is a social and collaborative process.
- 5) It is ongoing, with no clear beginning or end.
- 6) It is focused on and by extractive cues (cues are seeds from which people develop a larger sense of what might be occurring).
- 7) It is driven by plausibility rather than accuracy.

Throughout the process of gathering, analysing and interpreting data, I remained grounded in complexity theory and systems thinking⁴. These frames emphasize the importance of linkages, interdependencies and whole systems, and reject compartmentalisation and reductionism (Morin, 1999). The subject of interest is thus studied ecologically and in relation to the cultural, social, economic, political and natural environment (Morin, 1999).

By utilising QDA and sense-making theory, and by grounding myself in complexity theory and systems thinking, I would identify a series of cross-cutting themes which emerged during the research process (see Chapter 5). These themes draw together the literature review and the case study and extrapolate the findings to the greater South African context.

2.5 LIMITATIONS OF THE STUDY

This study was conducted within the time frame of one year, and therefore had to be constrained accordingly. Limitations to this study include:

- 1) Early childhood is normally defined as the period of 0 – 9 years (Biersteker, 2006). This study, however, disproportionately focuses on children aged 2 and a half to 5 years. This was done to narrow the focus of the study and to accommodate the fact that centre-based ECD (including the Lynedoch Crèche) predominantly caters for children in this age range.
- 2) This study is biased toward centre-based ECD. Research in South Africa indicates that less than 20 per cent of children under the age of 5 are enrolled in a registered ECD centre (Statistics South Africa, 2008). Enrolment is strongly linked to household income levels. This implies that in South Africa access to high quality ECD is limited for 65.5 per cent of children under the age of 5, who are classified as poor (Biersteker, Streak & Gwele, 2008). In recognition of the low enrolment rate

⁴ See section 1.5 (page 19) for a brief description of complexity theory.

in South Africa, intervention strategies now emphasize the importance of home-based ECD (NIP for ECD, 2005). Neither the case study nor the literature review includes an in-depth discussion of non-centre-based ECD. This might wrongly lead to the conclusion that centre-based ECD is the only or the most appropriate way for ECD to be a pathway toward sustainable community development.

- 3) The Lynedoch Crèche is a centre-based ECD institution which is embedded within the emerging Lynedoch EcoVillage. This embeddedness allows the Lynedoch Crèche to slot into the larger ethos of sustainable development within the EcoVillage, and opens many opportunities for ecological learning and sustainable community development. The case study might unintentionally convey the message that possibilities for ecological learning and sustainable community development through ECD are limited to ECD centres in similar settings. This is false. I hope that the analysis sufficiently emphasises the importance of creating context-specific solutions to convey the message that every context presents unique opportunities for ecological learning and sustainable community development, using ECD as entry point.
- 4) I realise that two years' involvement with the Sustainability Institute and the Lynedoch EcoVillage, and my supervisor's connectedness to these establishments may have influenced my observation and analysis. While there is no guarantee against researcher bias, I took precautions to limit this bias – notably by seeking inputs from people unconnected to the Sustainability Institute and the Lynedoch EcoVillage, and by consistently triangulating data from fieldwork.
- 5) This study was completed within the time frame of one year. This allowed a very short time for fieldwork. To really investigate the impact that the crèche has in terms of the creation of alternative futures, a longitudinal study following children from the Lynedoch crèche would have been ideal.

2.6 CHAPTER SUMMARY

This chapter analysed the research strategy and methodology of this study. A literature review was selected as the most appropriate strategy to formulate a theoretical argument based on relevant and current literature. The practical research is presented in the format of a descriptive case study. This case study was selected because of its potential to demonstrate the practical realities of the theory developed in the literature review. Research activities for the case study included participant observation, interviews, the study of documents, objects and artefacts and an appreciative inquiry. This study is embedded in complexity theory and systems thinking and results are analysed using a qualitative data analysis technique and sense-making theory. The limitations of this study include a limited time frame, a nearly exclusive focus on centre-based ECD, a narrow focus in terms of the age range included in the discussion of ECD and the possibility of researcher bias because of my (and my supervisor's) association with the setting of the case study.

Chapter 3: Literature Review

3.1 INTRODUCTION

The purpose of the literature review is to utilise contemporary literature to answer the research questions set out in Chapter 1. The research strategy and methodology are presented in Chapter 2. The argument is divided into four sections. Section one describes the global polycrisis and the dominant neo-liberal developmental trajectory to illustrate the detrimental effects of a reductionist and mechanistic worldview on human and environmental well-being. I argue that mainstream education serves to perpetuate this worldview rather than to imagine alternative futures for current and future generations. The second section focuses on the emergence of developmental alternatives in response to the global polycrisis, in particular sustainable development and the developmental state. I argue that just and sustainable futures will require a concerted effort to enhance capabilities for sustainable development, and that this endeavour should start with integrated and ecologically orientated ECD. The third section focuses on ECD and the ways in which ECD might contribute to the development of sustainable and resilient communities through the enhancement of capabilities for sustainable development. To start with, the importance of high quality ECD for children's development and as national investment is highlighted. I then emphasise the importance of ensuring that the content and praxis of education is ecologically orientated and rooted in nature. I further suggest an approach to ECD that integrates learning with sustainable community development. Finally, the current status of ECD in South Africa is discussed as a preface for the case study in Chapter 4.

3.2 THE FUTURE

3.2.1 Introduction

Today's children are the leaders of tomorrow. The experiences that children have in the present have unequivocal implications for the future, as the future depends largely on the knowledge, skills and attitudes that children acquire in the present (Davis, 1998; Barnett & Ackerman, 2006; Heckman, 2006; McCain, Mustard & Shanker, 2007; Pressoir, 2008). In early childhood education, policy and development it is therefore critically important to creatively imagine alternative futures.

Whether in regards to our schools, societies or species, when taken-for-granted ways of thinking about the future are left unexamined, a closure of horizons occurs. Futures are foreclosed and 'inevabilities' are confirmed as 'realism' (Hutchinson quoted in Hicks & Holden, 2007: 503).

This section examines the 'inevitable' future that the world is heading towards within the dominant developmental paradigm. This future is characterised by multiple interdependent and interrelated crises which Edgar Morin (1999: 14) refers to as the "global polycrisis". I argue that the global polycrisis is largely brought about by the neo-liberal development trajectory which embodies a mechanic,

disjointed and compartmentalised worldview. This mode of reasoning has not only permeated politics and economics, but also education, which currently serves to perpetuate this worldview. Because education fails to enable children to examine 'taken-for-granted ways of thinking about the future', the future is effectively 'foreclosed', confirming 'inevitable' as 'realism' (Hicks & Holden, 2007: 506).

3.2.2 The Symptoms: The Global Polycrisis

The world is facing multiple crises that are inextricably interrelated and interdependent (Van Breda, 2008; Morin, 1999; Sterling, 2009). Edgar Morin refers to this convolution of crises as the 'global polycrisis' (1999: 14). While the future cannot be predicted, the trends outlined below provide a disquieting insight into probable future scenarios (Hicks & Holden, 2007). Today's children are the professionals, business leaders, politicians, economists, activists and community leaders of tomorrow. It is, therefore, vital to examine the ways in which children are prepared to survive in and transform a future which seems to be heading for disaster (Davis et al. 2009; Stone, 2009; Sterling, 2009). The following paragraphs outline a few of the most urgent challenges.

World population is projected to grow from the current 6 billion to 8 billion by 2030. This increase in population is combined with a steady trend towards urbanisation as over 60 million people move to cities per year. In 2007, more than half the world's population already lived in cities. The majority of the incoming urban population is expected to be absorbed by cities in Africa and Asia, that are the least equipped to deal with the influx in terms of infrastructure and services. In 2006, approximately one third of the total urban population – more than one billion people – lived in slums (United Nations, 2006)

The challenge of slums is but one manifestation of the poverty crisis. Some of the indicators of global urban poverty include:

- 1.1 billion people lack access to safe drinking water; 2.4 billion lack access to adequate sanitation.
- 1 billion people lack adequate shelter.
- 800 million people are malnourished.
- 22 per cent of children do not go to school (United Nations, 1998).

This is exacerbated by global inequality, as the richest 20 per cent of the world account for 86 per cent of total consumption expenditure, while the poorest 20 per cent account for only 1.3 per cent (United Nations, 1998).

It is also the poor who will be affected the most severely by the increase in global temperatures, even though they have 'contributed the least' (Stern, 2007). According to the Intergovernmental Panel on Climate Change (2007), climate change will affect the basic elements of life for people around the world, including access to water, food production, health, and the environment. The greatest contributor to global climate change is greenhouse gas emissions (GHGs), such as carbon dioxide, which increased by 70 per cent between 1970 and 2004 (IPCC, 2007).

The increase in GHG emissions is linked to an expanding global economy built on cheap oil. Currently, oil supplies more than 60 per cent of the world's energy. However, there is ample scientific evidence that the era of cheap oil is over (Campbell, 2002; Swilling, 2008; Barbier, 2009; Bentley, 2009). According to reports from the Oil Depletion Analysis Centre (Bentley, 2009), 90 per cent of oil resources have been discovered, and nearly half of that has been produced. Because the price of extraction increases as the quantity and quality of oil in the reserves decline, this effectively means that most of the cheap oil has already been produced (Campbell, 2002; Bentley, 2009). The decrease in supplies and increase in price will profoundly impact on the way in which the economy is configured.

Apart from its dependence on fossil fuels, the global economy is also heavily reliant upon natural resources. According to the Millennium Ecosystem Assessment (United Nations, 2003), 60 per cent of the key ecosystem services are degraded or unsustainably used. This includes fresh water, capture fisheries, air and water purification, and the regulation of regional and local climate, natural hazards and pests (United Nations, 2003; WWF, 2008; IEA, 2008). Even though the costs of unsustainable resources use are rising, the appropriation of these costs is being shifted from one group to another and to future generations (Swilling, 2008). The costs of unbridled economic growth will be paid predominantly by future generations (United Nations, 2003).

Our ability to produce food is being undermined as the land is poisoned by the excessive use of pesticides and industrial farming techniques. The findings of the International Assessment of Agricultural Knowledge, Science and Technology for Development Report (IAASTD, 2008) reveal that

- 23 per cent of agricultural land is degraded.
- 70 per cent of all freshwater is used for irrigation.
- Salinisation is increasing.
- Agriculture contributes 60 per cent of methane gases and 50 per cent of nitrogen oxide.
- Pesticides and chemical fertilisers cause groundwater pollution and loss of biodiversity.

Crises of overpopulation, environmental degradation, rapid urbanization, global warming, oil depletion and abject poverty constitute what is now becoming known as the global polycrisis. In the light of the global polycrisis, the future seems grim. Many scholars (Sen, 1999; Stiglitz, 2002; Rist, 2006; Hyden, 2006; Backstrand & Ingelstam, 2006; Bidwai, 2006; Swilling & Annecke, forthcoming) maintain that the problem lies with the development paradigm itself. The belief that neo-liberal development, as measured by Gross Domestic Product (GDP), is the path toward human well-being and happiness is brought into question by the reality described above. The following section argues that the polycrisis is largely a result of the fragmented and mechanistic worldview embodied by the neo-liberal developmental project.

3.2.3 The root causes: neo-liberal development and the modernist worldview

The predominant developmental paradigm for the past three decades is neo-liberal development, that relies on market forces to regulate and bring about development (Sen, 1999; Rist, 2006; Bidwai, 2006; Sterling, 2009). Government intervention is understood to create market distortions. Developmental

strategies, therefore, rely on policies that decrease the role of the state through structural reform, liberalisation, deregulation, privatisation, flexible exchange rates and the protection of intellectual property rights (Nederveen Pieterse, 2001; Stiglitz, 2002; Yachkaschi, 2008; Swilling & Annecke, forthcoming).

The overarching goal of neo-liberal development is economic growth as measured by GDP, since economic growth is understood to reduce poverty and increase societal well-being (Sen, 1999; Evans, 2002). Amartya Sen (1999)⁵ rejects this narrow view of development and purports that other factors beside GDP growth or increase in personal income contribute to human freedom. Hindsight seems to indicate that GDP growth serves not to reduce poverty but rather to further inequality and environmental degradation (Stiglitz, 2002; Kotzé, 2003; Yachkaschi, 2008).

What has actually emerged in place of these visions and proposals is a world that is better in some respects, considerably worse in many more respects and, in a few respects at least, a monstrosity. Today's world is more unjust; more skewed in the concentration and distribution of wealth between and within countries; more cruel to its underprivileged people; more violent, strife-torn and turbulent; and more divided than ever before along religious, ethnic and social fault lines (Bidwai, 2006).

The failure to anticipate the host of negative consequences can be, in part, attributed to modernist assumptions underlying neo-liberal development that promulgate the belief that humans are superior to the natural environment and have the ability to influence their surroundings in order to achieve predetermined outcomes (Capra, 1996; Morin, 1999; Van Breda, 2008). Human progress is seen as a linear, mechanistic process whereby desired end goals are identified ('being developed') and mechanisms that enable the achievement of these goals are adopted (Capra, 1996; Hyden, 2006; Backstrand & Ingelstam, 2006).

The realities of the global polycrisis accentuate the need for a shift away from a modernist, reductionist way of thinking towards an ecological worldview that embraces complexity and the interdependence of life⁶. Current and future leaders will require an ability to link the compartmentalized, respect diversity, discern interdependencies and facilitate a constant movement between parts and the whole (Morin, 1999; Cilliers, 2000a,b).

The following section points out that mainstream education remains centred in the linear and reductionist style of reasoning and is therefore failing to prepare children for leadership in an unstable and unpredictable future (Diaz, 2008; Le Grange, 2008).

⁵ Winner of the 1998 Nobel Prize for Economic Science.

⁶ The 'deep ecology' movement is one school of thought that promotes a worldview based on the rich connections between all living things. According to supporters of the deep ecology movement, all living beings are interconnected and have inherent value. Such an understanding necessitates a thorough re-examination of the root causes of the environmental crisis in order to fundamentally reform the dominant developmental trajectory. This is contrasted with 'shallow ecology', which seeks only to ameliorate the crisis, but fails to alter the status quo (Drengson, n.d.).

3.2.4 The problem of mainstream education

No problem can be solved from the same consciousness that created it. We have to learn to see the world anew - Albert Einstein (quoted in Sterling, 2009: 12).

The polycrisis is a result of multiple decisions taken over a period of time by various actors seeking to bring about 'development'. These actors were mostly educated in the same way that children are educated today (Davis, 1998). If Einstein is right (see quote above), it seems logical to suggest that the most important task of education is to enable children (who are the leaders of the future) to question dominant worldviews and taken-for-granted perceptions critically (Littledyke, 2007; Sterling, 2009; Stone, 2009).

I agree with many who feel that mainstream education is yet to respond to the realities of the global polycrisis. Although education is widely heralded as the hope for the future⁷, it serves to perpetuate a status quo that is disconnected from nature and driven by consumerism (Orr, 1992; Irwin, Siddiqi & Hertzman, 2007; Stone, 2009). According to E.F. Schumacher:

The volume [...] of education continues to increase, yet so do pollution, exhaustion of resources, and the dangers of ecological catastrophe. If still more education is to save us, it would have to be education of a different kind: an education that takes us into the depth of things (E.F. Schumacher, quoted in Sterling, 2009: 21).

The foundation on which mainstream Western education is built can be traced back to thinkers such as Bacon, Galileo and Descartes.

Historically, Francis Bacon's proposed union between knowledge and power foreshadowed the contemporary alliance between government, business and knowledge that has wrought so much mischief. Galileo's separation of the intellect foreshadowed the dominance of the analytical mind over that part given to creativity, humour and wholeness. And in Descartes' epistemology, one finds the roots of the radical separation of self and object (Orr, 1994: 8).

The modernist paradigm is auspicious in the reductionist and mechanistic worldview which informs educational philosophy, pedagogy and practice (Orr, 1992; Orr, 1994; Le Grange, 2008; Diaz, 2008; Sterling, 2009; Stone, 2009). Consider, for example, the way in which most educational institutions are organised according to specialized disciplines: disciplines hardly interact and factual knowledge is prized above values, responsibility, ethics, feelings and emotions (Orr, 1992; Orr, 1994; Morin, 1999; Max-Neef, 2005; Van Breda, 2008; Sterling, 2009). This specialization is blind to the way in which complex issues are interconnected (Herbert, 2008; Sutton, 2009). This partially explains the host of unforeseen consequences that are often attached to modern-day 'solutions' (Orr, 1994; Morin, 1999, Cilliers, 2000a).

⁷ The second of the eight United Nations Millennium Development Goals, for example, is to achieve universal education by 2015. The global 1Goal campaign is another widely supported movement seeking to ensure access to education for 69 million children by 2015.

The division of knowledge into specialised disciplines implies that the subject in question is taken from its context and studied in isolation, thereby denying all spatial and temporal links to other phenomena in its natural context (Morin, 1999; Cilliers, 2000a; Max-Neef, 2005; Le Grange, 2008; Sterling, 2009). When the rational, analytical, and reductionist mind is perceived to be superior, other ways of being and knowing that are as valid as rationality are neglected, such as intuition, feeling, or sensing (Morin, 1999; Max-Neef, 2005). This robs education and science of much of its richness. According to Johan Wolfgang von Goethe:

Science is as much an inner path of spiritual development as it is a discipline aimed at accumulating knowledge of the physical world. It involves not only a rigorous training of our faculties of observation and thinking, but also of other human faculties which can attune us to the spiritual dimension that underlies and interpenetrates the physical: faculties such as feeling, imagination and intuition (in Max-Neef, 2005: 16).

Another shortcoming of mainstream Western education is that it prepares children to become members of the capitalist workforce (Orr, 1992; Orr, 1994; Sutton & Kemp, 2002; Le Grange, 2008; Stone, 2009; Sterling, 2009). By focusing primarily on competition and consumption, this educational paradigm uncritically accepts and promotes existing social structures and hierarchies (Fien, 1993; Le Grange, 2008; Sterling, 2009).

The purpose of education is to increase levels of knowledge and understanding. The irony is that increased levels of education appear to increase human ignorance, as humans are no longer able to inhabit the planet sustainably (Orr, 1992; Orr, 1994; Sterling, 2009). Increased levels of literacy seem to correlate with environmental destruction. Hitherto, only illiterate people have lived sustainably (Orr, 1992). In the words of Chateaubriand (quoted in Orr, 1992: 65): “forests precede civilisations and deserts follow”. It is possible that the problem, therefore, is not a lack of education, but a lack of a sense of belonging to the biosphere. Re-education and de-learning is needed to bring about change in all aspects of human behaviour in order to respond to the global polycrisis (Littledyke, 2007; Diaz, 2008; Herbert, 2008; Louv, 2008).

2.3.5 Section Summary: The future

This section sketched a grim picture of the future that this planet is heading towards if the status quo is maintained. Various elements of the global polycrisis were explored, including global warming, ecosystem collapse, rising poverty and inequality, population growth and urbanisation and peak oil. The modernist worldview that underpins the neo-liberal developmental trajectory was identified as a core instigator of the global polycrisis. Mainstream education appears to be exacerbating the global polycrisis by instilling in children the same worldview that is causing the global polycrisis in the first place.

3.3 CHANGING THE COURSE OF DEVELOPMENT

3.3.1 Introduction

The number, complexity and interrelatedness of the issues now indicate that a strategy that consists of relatively unconnected adjustments to social or economic policies is less likely to be successful than a systematic attempt to construct socio-economic systems that engage and interact appropriately with the ecological systems of the planet (Clayton & Radcliffe, 1996: 43).

This quote (above) highlights the fact that the elements of the global polycrisis are interdependent to the extent that only a radical and systemic approach would stand any chance of bringing about transformation. Solutions, therefore, must be wrought from a radical paradigm shift from a reductionist, mechanical worldview to one that acknowledges complexity and promotes resilience through an appreciation of diversity (Capra, 1996; Macy & Young-Brown, 1998; Folke et al., 2002).

Alternative developmental paradigms are emerging in response to this need for a change in consciousness (Nederveen Pieterse, 2001; Castells, 2004; Hawken, 2007; Yachkaschi, 2008). Hawken (2007) argues that the dominant developmental paradigm is already being challenged by a series of embedded global and local movements (including non-profit groups, community organisations and individuals) working towards sustainable livelihoods, food security, peace, healthy environments and freedom from tyranny (Nederveen Pieterse, 2001; Castells, 2004; Hawken, 2007; Yachkaschi, 2008).

Two important alternative developmental paradigms are sustainable development, which encompasses a more holistic and ecologically sound approach to development, and the developmental state, which looks beyond GDP as measure of well-being toward other developmental indicators such as the enhancement of people's capabilities to lead the kinds of lives they value (Mebratu, 1998; Sen, 1999; Evans, 2002; Folke et al., 2002; Evans, 2010). The following section considers sustainable development and the developmental state as two alternative developmental paradigms that correspond with the goals of the emerging movements described above. The argument will be made for integrating the strands of thinking that inform sustainable development and the 21st century developmental state to the purpose of enhancing capabilities for sustainable development.

3.3.2 Sustainable Development

The goal of sustainable development is to create and maintain prosperous social, economic and ecological systems (Folke et al., 2002; Lehtonen, 2004; Rogers, Jalal & Boyd, 2005). The concept emerged in response to the realisation that unbridled economic growth that externalises environmental and social costs is unsustainable, and detrimental to the planet and to human well-being (Dresner, 2002; Rogers, Jalal & Boyd, 2005; Schulschenk, 2010). The most influential definition of sustainable development, put forward in 1987 by the World Commission on Environment and Development (WCED) in the well-known report, *Our Common Future*, was that "sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987:42).

Our Common Future marked the inclusion of sustainable development as an important item on the international policy agenda. The definition is much contested, but remains valuable in the debates, literature, meetings and discussions which emerged from it. One of the limitations of the Brundtland definition is its anthropocentric worldview, which seems to value nature in instrumental terms only (Mebratu, 1998, Hattingh, 2001, Dresner, 2002; Swilling & Annecke, forthcoming). Another limitation is the failure to refer explicitly to social development and environmental limits. Moreover, the definition is criticised as being sufficiently ambiguous to suit political and corporate agendas (Dresner, 2002; Rogers, Jalal & Boyd, 2005). While the multiplicity of interpretations might result in the term losing power, diverse interpretations might render it useful in diverse contextual realities (Backstrand & Ingelstam, 2006).

A forward looking interpretation might look beyond the conventional understanding of sustainable development as a trade-off between social, economic and environmental 'spheres' towards the understanding that any endeavour to bring about an improvement in quality of life will have to take place within environmental limits (see figure 3.1 below) (Gallopín, 2003; Schulschenk, 2010). This understanding emerges from the recognition that humans and nature form part of a web of life, and are interdependent and interconnected parts of a greater system (Capra, 1996; Macy & Young-Brown, 1998). While nature sustains human life on earth, human activities threaten the health of nature to a point of ecosystem collapse. It is imperative, therefore, to pursue pathways toward human well-being that do not depend upon increased levels of material wealth or resource intensive economic growth (Capra, 1996; Sen, 1999; McLaren, 2003; Evans, 2010).

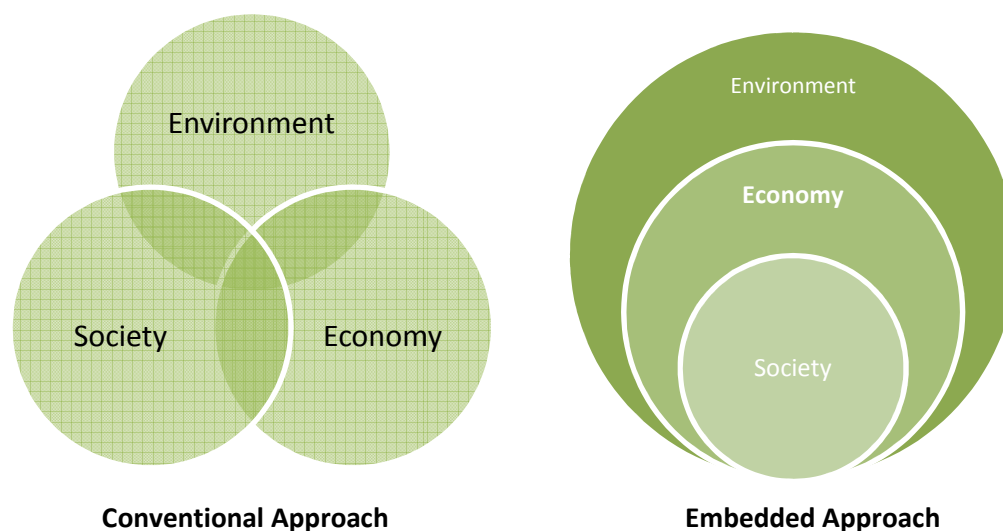


Figure 3.1: Conceptions of sustainable development

(Source: Adapted from Bartelmus, 1994; Mebratu, 1998 and Schulschenk, 2010)

For the purposes of this essay, I will endorse the definition of sustainable development put forward by Schulschenk (2010):

Sustainable development improves the quality of life for all humans equitably, both intra and inter-generationally, within the context of the earth's limited carrying capacity.

3.3.3 The 21st century developmental state

The 20th century East Asian developmental state is lauded for the way in which it changed the developmental status of countries such as Korea and Taiwan from “underdeveloped” to “developed” in a matter of two generations. This ‘success’ is measured by a variety of indicators such as the Human Development Index (HDI), GDP growth per capita or more specific measures of industrial competitiveness (Evans, 2007; Swilling and Annecke, forthcoming). Evans (2007: 12) describes the 20th century developmental state as “a coherent capable state apparatus [is] paired with dense ties to private entrepreneurial elites to produce forward-looking investments that enhance productivity, grow incomes and lead to increased well-being”. In South Africa, the ruling African National Congress (ANC) adopted the developmental state as official ideology in 2002. This signals the ANC's willingness to distance itself from the neo-liberal fundamentalism. It remains questionable whether the adoption of the 20th century East Asian developmental model is appropriate (Swilling and Annecke, forthcoming; Butler, 2010; Edigheji, 2010).

The 21st century, however, presents new challenges to the developmental state. The global economy is shifting increasingly towards ‘bit-driven growth’, where “value added comes from new ways of arranging bits of information in formulas, software code, and images and less from the physical manipulation of materials to make tangible goods” (Evans, 2007:4). Manufacturing employs a rapidly shrinking number of people, even in the global South. According to Evans (2007), there are three strands of developmental economics that could, in a type of synthesis, provide a possible basis for the 21st century developmental state. These are:

- **Endogenous growth theory:** Lucas, 1988; Aghion and Howitt, 1998; Helpman, 2004.
- **Capability Approach:** Mahbub Ul Haq, 1995; Sen, 1999.
- **Institutional Approaches:** Rodrik, 1999; Stiglitz, 2001; Rodrik, Subramanian & Trebbi, 2004; Hoff &, Acemoglu & Robinson, 2005.

Endogenous growth theory (or “new growth theory”) suggests that “the diminishing returns on increasing capital intensity are counter-acted by the returns on technological innovation” (Swilling & Annecke, forthcoming: no page number). This effectively means that it is not capital accumulation that creates economic growth, but intangible assets such as ideas, skills, and networks that fuel technological innovation (Aghion & Howitt, 1998; Evans, 2005; Yachkaschi, 2008; Swilling & Annecke, forthcoming). Therefore, public investment in education and training becomes critical, and dense ties between the state and society are needed to capture and utilise new knowledge (Aghion & Howitt, 1998; Evans, 2007; Yachkaschi, 2008; Swilling & Annecke, forthcoming).

The capability approach, as put forward in Amartya Sen's book *Development as Freedom* (1999), highlights the fact that growth in GDP per capita (which is the dominant indicator of development) can not necessarily be equated to an increase in well-being, and should be valued only to the extent that it can be empirically connected to improved well-being. There is no single measure of progress. Rather, developmental goals should be publically deliberated through deep democratic institutions (Sen, 1999). This is one of the greatest divergences from the 20th century developmental state where the political and economic agendas were mostly implemented from the top down (Sen, 1999; Evans, 2002; Evans, 2007; Yachkaschi, 2008; Swilling & Annecke, forthcoming). The principle purpose of development, according to Sen, is to "increase people's capabilities to lead the kind of lives they value – and have reason to value" (1999: 10). The notion of capabilities includes not only a person's actual achievements, but also a person's ability to achieve: "capabilities [...] are notions of freedom, in the positive sense: what real opportunities you have regarding the life you may lead" (Sen, 1987: 36).

Where endogenous growth theory and the capability approach converge, the expansion of human capabilities becomes both the means and the end of development. Both these approaches emphasise the importance of collaboration between the state and society. The extent and nature of collaboration between the state, industrial elites and civil society is determined by the institutional arrangements within a particular country. According to the line of thinking of institutional approaches, solid institutional frameworks are needed to create shared normative expectations which bring about optimal collaboration (Evans, 2007). Evans (2005) puts forward the concept of 'embedded autonomy' whereby the state is intricately connected to industrial elites and civil society. Through connectedness and interdependence, synergies are created and, according to Evans, "creative action by government organisations can foster social capital; linking mobilized citizens to public agencies can enhance the efficacy of government" (Yachkaschi 2008: 14). As a result of synthesizing endogenous growth theory, the capability approach and institutional approaches, the core question underlying the configuration of the 21st century developmental state becomes: "What kind of institutional arrangement will best enable societies to generate new skills, knowledge and ideas and the networks needed to diffuse and take advantage of them?" (Evans, 2007:6).

3.3.4 Enhancing capabilities for sustainable development

Swilling and Annecke (forthcoming) expands Evans' argument by questioning the ability of the 21st century developmental state, as embodied by the synthesis of these three developmental theories (endogenous growth theory, the capability approach and institutional economics), to meet the challenges created by the global polycrisis. Both institutional economics and endogenous growth theory continues to propagate economic growth as measure of development. Economic growth as we know it, however, is heavily reliant on fossil fuels and resource exploitation (Barbier, 2009). In the light of the ecological limits that the planet faces, the 21st century developmental state will have to adopt growth strategies that are decoupled from the intensive use of finite natural resources (Barbier, 2009; Swilling, 2010; Swilling & Annecke, forthcoming).

Therefore, if growth is attained by means of intangible assets such as ideas, innovation, networks and enhanced human capabilities, the question to ask is: ‘what kind of growth?’. The ecological and social unsustainability of limitless economic growth requires that the 21st century developmental state pursue a kind of growth that occurs within ecological limits – growth that is sustainable and decoupled from resource exploitation. Decoupling growth from resource exploitation will not be possible without innovation, and innovation will not be possible without the enhancement of capabilities. Capability enhancement for sustainability therefore becomes the means and the end toward sustainable development (Swilling & Annecke, forthcoming). I therefore agree with Swilling and Annecke (forthcoming: no page number) in proposing that “the 21st century developmental state fundamentally requires an enhancement of capabilities for *sustainable* development”.

The urgency of the global polycrisis emphasises the importance of rethinking the purpose of development. Is the purpose to continue the production of endless amounts of goods, while ultimately creating unsustainable futures? If alternative futures are desired, then it is imperative to take immediate steps toward the enhancement of capabilities for sustainable development within current leadership structures, corporate spheres and political regimes. At the same time, and keeping in mind that today’s children will soon be the leaders who take this movement forward, it seems sensible to place children at the centre of all efforts to enhance capabilities for sustainable development (Le Grange, 2008; Diaz, 2008; Didonet, 2008; Davis et al., 2009;). Early childhood is formative for the establishment of lifelong values, attitudes, knowledge and skills (McCain, Mustard & Shanker, 2007; Littledyke, 2007; Pressoir, 2008). For this reason, ECD may significantly contribute to the enhancement of capabilities for sustainable development (see section 3.4 below) (Davis, 1998; Evans, 2007; Pearson & Degotardi, 2009).

3.3.5 Section Summary: Changing the course of development

This section highlighted the emergence of alternative developmental paradigms in response to the global polycrisis, which was largely brought about by the modernist worldview which underpins neo-liberal development. Sustainable development and the 21st century developmental state were discussed as important elements contributing towards a shift in the developmental discourse. The argument was made that an appropriate response to current and future challenges might be to integrate these two paradigms through the enhancement of capabilities for *sustainable* development. It is vital that the enhancement of capabilities for sustainable development commence in early childhood, as this is the time when lifelong values, attitudes and skills are developed.

3.4 EARLY CHILDHOOD DEVELOPMENT

3.4.1 Introduction

I have suggested that Early Childhood Development (ECD) is vital for the enhancement of capabilities for sustainable development, which are integral to the 21st century developmental state (Evans, 2007; Swilling & Annecke, forthcoming). This view values children as the very fabric of communities, and suggests that the prosperity of communities depend on children’s opportunities to develop, grow and

learn to their full potential during the early years. It is not new to say that ECD lays the foundations for children's development in terms of cognitive, social and emotional abilities (Barnett & Ackerman, 2006; Heckman, 2006; McCain, Mustard & Shanker, 2007; Pressoir, 2008). Beyond that, in order to break from the mould of modern, mechanistic education, it seems vital that ECD is also an introduction into the wonders of our universe, the diversity of nature, the beauty of our planet and the importance of each person's story in the universal timeline (Davis, 1998; Herbert, 2008). Instead of separating ECD from parents and communities, ECD facilities have the possibility of becoming community hubs where the transformative energy that children exude is channelled into multiple interrelated projects. In addressing not only ecological challenges, but social and poverty-related challenges as well, the ECD space becomes one where ecology and equity meet (Ball, 2005; Hornby, 2005; McCain, Mustard & Shanker, 2007).

In this section I re-emphasize the importance of integrated solutions, grounded in complexity, that start in early childhood. Firstly, the importance of ECD is discussed by looking at children's rights, children's development, socio-economic equality and the economic benefits of investment in high quality ECD. Secondly, the content of and approach to ECD is examined, and ecological learning is suggested as a possible way to move away from the modernist educational mould in order to help children to connect deeply with, and learn from nature. Following an explanation of what ecological learning is, I describe ecological design, beauty, food security and place-based education as elements that are central to an integrated, ecological approach to early childhood development. Thirdly, the concept of embedded and integrated ECD is explored. Theoretical propositions are supported by three cases that were selected because of their demonstrative value regarding different approaches to integrated, community-based ECD.

3.4.2 The case for ECD

3.4.2.1 *Children's rights*

In a rights-based approach to early childhood development, children are seen as stakeholders of a country who have the right to 'legitimise claims to state resources and to participating in decisions that affect their daily lives' (Hornby, 2005: 9; Hagglund & Pramling-Samuelsson, 2009). The UN Convention on the Rights of the Child (1989) guarantees children of all ages the right to survival, development, protection and participation. In line with the UN Convention on the Rights of the Child is the recognition in the Constitution of the Republic of South Africa, Act 108 of 1996, Chapter 2: Bill of Rights, of the need to secure the well-being and future development of all children. The importance of ECD in the 'well-being and future development' of children is internationally recognized (Davis et al., 2009; Biersteker & Louw, 2006).

3.4.2.2 *Children's development*

High quality early childhood education is one of the most important gifts that a community and child can receive in the child's journey towards becoming a confident, well-rounded and well-educated human being. Early childhood is a time of unparalleled learning and absorption. What a child sees, hears and feels intensely during the early years becomes an integral part of the child (De Haan et al., 2004;

Greenspan & Shanker, 2004; McCain, Mustard & Shanker, 2007; Didonet, 2008; Pressoir, 2008; Pramling-Samuelsson & Kaga, 2010).

Children's experiences have far-reaching and solidifying effects on the development of their brains and behaviour. Diverse experiences affect the brain, the expression of genes, bio-chemistry and physiology of the body – all of which mediate our cognitive, emotional and social behaviour (McCain, Mustard & Shanker, 2007: 13).

The neurological pathways in the brain that determine children's core capacities and developmental trajectories are mostly developed in early childhood (Gage, 2003). Connections form between neurons and neural networks that determine children's ability to concentrate, process and retain information, recognize patterns, absorb new information, and understand social situations (Gage, 2003; Knudson, 2004; McCain, Mustard & Shanker, 2007). Frequent use strengthens and solidifies neural pathways. Once they are established, however, they are difficult to alter (Gage, 2003; McCain, Mustard & Shanker, 2007).

This partially explains why exposure to neglect, maternal depression, family violence, caregiver substance abuse and physical, sexual or verbal abuse have long-term negative effects (De Haan et al., 2004; Mustard, McCain & Shanker, 2007). A study by Teicher et al. (2003) revealed that such early childhood stresses are likely to manifest in learning difficulties and behavioural problems at school, and in depression, anxiety, stress, aggression, hyperactivity or substance abuse in adulthood. Conversely, early environments filled with love, beauty and affection contribute to children's development into confident adults, who are more able to engage in relationships maturely (Greenspan & Shanker, 2004; McCain, Mustard & Shanker, 2007). It seems clear that stimulating, nurturing early childhood environments are critically important for the long-term development and well-being of children (Greenspan & Shanker, 2004; McCain, Mustard & Shanker, 2007; Pressoir, 2008; Davis et al., 2009).

The family is the child's primary environment (Greenspan & Shanker, 2004; Heckman, 2006; Marchuk, 2007; McCain, Mustard & Shanker, 2007; Pressoir, 2008). Many children, however, spend the larger part of the day with a caretaker, a playgroup or a crèche. In Western countries, approximately one third of all children are cared for outside the home from the age of one, and most children attend some form of early childhood programme for at least two years before starting primary school (Pramling-Samuelsson & Kaga, 2010). Globally, the percentage of children enrolled in an early childhood development programme of some sort grew from 33 per cent to 40 per cent between 1999 and 2006. Global disparities in access to ECD facilities are significant, with enrolment figures of 81 per cent in North America and Europe, 45 per cent in East Asia and the Pacific, 65 per cent in Latin America and the Caribbean, and only 14 per cent in sub-Saharan Africa (Jaramillo & Mingat, 2006; Pramling-Samuelsson & Kaga, 2010).

Centre-based ECD programmes have the potential to contribute significantly to children's development and well-being. A child can never be compensated for opportunities lost because of poor early childhood environments (McCain, Mustard & Shanker, 2007).

3.4.2.3 Equity

Children born into poverty confront their greatest and most long-lasting disadvantage during the gestation period and the first years of their lives (De Haan et al., 2004). More than 200 million children in sub-Saharan Africa (approximately 39 per cent) are not fulfilling their developmental potential, due to a lack of resources, stimulating environments and sufficient nutrients (Young & Mustard, 2007; Chilton, Chyatte & Breaux, 2007). This has profound implications for the children, their families, communities and the national development of their country (Hornby, 2005; Biersteker & Louw, 2006; Chilton, Chyatte & Breaux, 2007; Pressoir, 2008).

Childhood poverty is one of the most accurate predictors of adult failure, both socially and economically (Esping-Anderson, 2002). Low income families are associated with low parental cognitive abilities and inadequate stimulation in early childhood (Barnett & Ackerman, 2006; Irwin, Hertzman & Siddiqi, 2007). There is a very strong correlation between family income and the cognitive abilities of the child as she/he enters preschool (Esping-Anderson, 2002; McCain, Mustard & Shanker, 2007).

In South Africa, 65.5 per cent of children are classified as poor (Biersteker, Streak & Gwele, 2008). A large portion of these children are raised by uneducated parents. Low parental cognitive abilities are coupled with limited resources and other poverty-related issues including hunger, malnutrition, crime, substance abuse and teenage pregnancy (Esping-Anderson, 2002; McCain, Mustard & Shanker, 2007; Biersteker, Streak & Gwele, 2008). It seems imperative to secure universal access to high quality ECD programmes for these children, as they deserve the opportunity to enter life on an equal footing to their more privileged peers (Lynch, 2004; Biersteker & Louw, 2006; Irwin, Hertzman and Siddiqi, 2007).

3.4.2.4 The Economic Argument

Nobel Prize winner J.J. Heckman claims that “investing in disadvantaged young children is an economically efficient policy” (Heckman, 2006:1). The long-term economic benefits of high quality ECD relate to the development of children’s capabilities to complete school, find adequate employment and integrate successfully as a participating member of the community (Lynch, 2004; Biersteker & Louw, 2006; Heckman, 2006; McCain, Mustard & Shanker, 2007). Longitudinal studies find that children enrolled in high quality ECD are more likely to complete school and pursue further education. They are also more likely to be employed, to earn higher wages and to rely less on external economic support. The propensity to engage in criminal activities later in life declines (Barnett et al., 2006; Barnett & Ackerman, 2006). To the national economy and society as a whole, this implies higher tax contributions, decreased expenditure on social welfare and decreased costs of criminal justice (Lynch, 2004; Barnett et al., 2006; Heckman, 2006; Barnett & Ackerman, 2006).

A further keystone in the economic argument for ECD is the high cost and low success rate of remedial education (Esping-Anderson, 2002; Lynch, 2004; Heckman, 2006). Remedial education is only successful if students have already acquired an ability to learn. Investment in remedial education endeavours to bring about equity and equal opportunities for all, yet such investments are economically inefficient (Esping-Anderson, 2002; Lynch, 2004; Heckman, 2006; McCain, Mustard & Shanker, 2007).

Varying monetary values have been assigned to the benefits rendered to society through ECD. Lynch (2004), assigns a benefit–cost ratio exceeding 3:1 to investment in high quality ECD. McCain, Mustard and Shanker (2007) estimate this ratio at 8:1 as opposed to a benefit–cost ratio of 3:1 for investment in primary or secondary school. Heckman (2006) calculates the returns per dollar invested at between 15 per cent and 17 per cent through gains in earnings. In a longitudinal cost–benefit analysis of the High/Scope Perry Preschool Program⁸, the net present value of the benefits to society per child (in terms of higher earnings, reduced crime and reduced welfare transfers) was calculated at \$76 077⁹, which is more than six times the total cost of the programme (\$12 356) (Barnett et al. 2006).

3.4.2.5 *Summary: the case for ECD*

The importance of early childhood development is widely acknowledged. This section examined the importance of ECD from four perspectives. The first articulates children’s rights to develop, participate and survive. It follows, therefore, that every child has the right to stimulating and nurturing early childhood environments. The second perspective describes the impact that a child’s environment has on his/her brain development. Thirdly, ECD is a way to level the playing field in terms of opportunities for learning and development. Finally, research indicates that investment in high quality ECD is an efficient economic investment that reaps many long-term economic benefits in terms of increased productivity of the labour force, increased tax returns through higher earnings, decreased national expenditure on crime and welfare and a decline in the need for remedial or adult education.

3.4.3 **Towards Ecological Learning**

3.4.3.1 *Introduction*

Today’s children [...] are already in a world where environmental damage, social injustice, and appalling ill-health are major features of the global landscape. Surely one of the greatest tasks for any society is to equip its children with the attitudes, values, knowledge and skills necessary to rethink and change current patterns of action and to secure healthy, just and sustainable futures for all (Davis, 1998: 117).

The reform of education has already begun. In recognition of the global polycrisis, and acknowledgment of the shortcomings of mainstream education previously discussed¹⁰, the last couple of decades have produced a plethora of international institutions, conventions, debates, publications and declarations concerned with the need for educational reform that would enable learners to address the global

⁸ Barnett et al. (2006) conducted a longitudinal cost-benefit analysis of the High/Scope Perry Preschool Program in Ypsilanti, Michigan, USA. In the 1960’s, 123 three- and four year old African American from this programme randomly assigned to either a treatment or control group. The treatment group received high quality, intensive ECD interventions consisting of a centre-based program for 2.5 hours per day each weekday, home visiting for 1.5 hours per week and parent group meetings (Barnett, 1985). This American-based study was selected because I am not aware of similar longitudinal cost-benefit studies of ECD within a South African context.

⁹ Data derived from 1992 dollars, discounted at 3 per cent.

¹⁰ See section 3.2.4 on page 39.

ecological crises¹¹. One outcome of the World Summit on Sustainable Development held in Johannesburg in 2002 was that the United Nations declared 2005 – 2014 the ‘Decade of Education for Sustainable Development’ with the goal of:

Integrating the principles, values and practices of sustainable development into all aspects of education and learning. [...] This educational effort will encourage changes in behaviour that will create a more sustainable future in terms of environmental integrity, economic viability and a just society for present and future generations (UNESCO, 2010).

The term ‘environmental education’ has also been linked to the reform in education. There are many debates and controversies surrounding the meaning of both ‘education for sustainable development’ and ‘environmental education’, and which of the two is more appropriate. The scope of this study does not allow for an in-depth exploration of these debates. Instead, the term ‘ecological learning’ is employed to denote an approach to education which is rooted in complexity and ecology. I agree with Le Grange (2008), who emphasizes the importance of determining how education can be uniquely imagined and expressed by individuals and institutions in accordance to their environment and context.

Up to this point, I have explained why high quality ECD is critically important. It seems as important to consider the approach to and content of ECD to ensure that ECD not only prepares children as consumers of the future, but equips children with the “attitudes, values, knowledge and skills needed to rethink and change current patterns of action” (Davis, 1998: 117) The following section suggests ecological learning as a possible framework for ECD to enhance capabilities for sustainable development and prepare children as agents of change, who are deeply connected to nature. To begin with, the meaning of ecological learning is discussed. Subsequently the importance of beauty, ecological design, food security, nature and the study of resource flows are explored as elements that contribute to and reinforce ecological learning in early childhood. To illustrate the application of these elements of ecological learning, I then make brief reference to the Montessori method as a useful pedagogy for ecological learning. The intention is not to suggest this method as the only one, or superior to others, but to demonstrate a practical and viable option for ways of learning that are cognitively enriching, integrated and connected to nature.

3.4.3.2 *What is ecological learning?*

While mainstream Western education is concerned with the search for knowledge, ecological learning is inspired by a sense of wonder (Carson, 1965; Orr, 1992; Orr, 1994). This wonder is born from the mystifying delight of being alive in a world that is intricate, beautiful and filled with diversity; it is the urge to be part of something that is beyond human reason. Learning driven by a sense of wonder starts

¹¹ See, for example:

- The Tbilisi Declaration (<http://www.gdrc.org/uem/ee/tbilisi.html>).
- The Bonn Declaration (www.esd-world-conference-2009.org/.../ESD2009_BonnDeclaration080409.pdf).
- The Earth Charter (http://www.earthcharterinaction.org/invent/images/uploads/echarter_english.pdf).
- Article 26 of Agenda 21 (<http://www.un.org/esa/dsd/agenda21/>).
- The United Nations Decade on Education for Sustainable Development 2005–2014 (<http://www.unesco.org/en/esd/>).

in childhood, when the flicker of a leaf and the wings of a butterfly urge children to see and experience more (Carson, 1965; Orr, 1992; Louv, 2008; Herbert, 2008). This sense of wonder relates to E.O. Wilson's concept of 'biophilia', which is an affinity for the living world (Louv, 2008). Knowledge about nature and facts about the environmental crisis are inadequate if not coupled with a love for nature. One fights only for that which one loves (Orr, 1992; Herbert, 2008; Louv, 2008; Pressoir, 2008).

An ecologically literate person is described by Glenn Gray as:

One who has fully grasped the simple fact that his/her self is fully implicated in those beings around him, human and nonhuman, and who has learned to care deeply about them. Ecological learning serves to develop the capacity for clear thought and compassion in the recognition of the interrelatedness of life (Orr, 1992: 100).

Herbert (2008) asserts that learning should equally engage minds, hearts, spirits and hands. The ecologically literate person is able to simultaneously use intellect and feeling, heart and hands (Orr, 1992; Herbert, 2008).

David Orr (1992) identifies five principles which constitute ecological learning:

1) Understanding the interrelatedness of life

Ecological learning is based on an understanding of the interrelatedness of life (Orr, 1992; Miller, 2002; Herbert, 2008; Hagglund & Pramling- Samuelsson, 2009). Many of the problems which exacerbate the global polycrisis result from disjointed and compartmentalised thinking (Taylor, 1987). Ecological learning, therefore, seeks to help children understand links and systems so that they know their place in the 'web of life', and the importance of their story in the continuum of time (Orr, 1992, 1994; Capra, 1996; Sandhu, 2008). This does not mean that the theory of complexity must be taught to small children. Complexity and interrelatedness are best learned through the cycles of nature. Young children might learn where food comes from, participate in growing it and rework the organic waste into the soil for the next round of crops. This can be further expanded to learning about the carbon cycle, nutrient cycles, the cycle of water, wind patterns, temperatures, the effects of fire in fynbos and many of the other life-giving elements within the natural world (Miller, 2002).

2) A sense of urgency

Ecological learning fosters an understanding of the speed of the crisis which is upon us by reading the vital signs of the earth. In this regard, information about soil erosion, population growth, climate change, species extinction, deforestation, pollution and resource exploitation is useful (Orr, 1992; United Nations Millennium Ecosystem Assessment, 2005; IPCC, 2007; Hicks & Holden, 2007).

3) Understanding the root causes of the environmental crisis

An ecologically literate person seeks to understand the root causes of the environmental crisis. To this purpose she/he critically examines social structures, religion, science, politics, technology,

patriarchy, culture and agriculture in order to grasp how, why and when people became destructive (Orr, 1992; Clayton & Radcliffe, 1996; Rogers, Jalal & Boyd, 2005).

4) Developing an ecological consciousness

Developing an ecological consciousness necessitates some probing into questions of ethics and values. One might ask questions relating to the place that humans have in the continuum of time on earth, or which solutions will be required to ensure the future health and well-being of both humans and nature (Orr, 1992). An ecological consciousness also implies a certain mindfulness regarding one's place and way of living. Typical questions which stimulate such mindfulness include:

- *Where does my waste go?*
 - *Where does my water come from?*
 - *Where does my food come from?*
 - *Which rivers run through my town?*
 - *Which trees are indigenous?*
 - *What type of soil forms the earth where I live?*
 - *Which birds and animals live near me?*
 - *Which plants and flowers live near me?*
 - *What foods are in season where I live?*
 - *When is the next full moon?*
- (Orr, 1992; Lamers, 2008; Stone, 2009; Sterling, 2009)

5) Ecological learning as a preface to the development of capabilities for sustainable development

The ultimate purpose of ecological learning is to ensure that children have the capabilities required to be agents of change in their own families, communities and countries (Orr, 1992). Education can be in the environment, whereby nature experiences are continuous and emphasized, or about the environment, where children are taught the processes and cycles of nature (Davis, 1998). However, neither of the preceding paradigms is sufficient. What is needed for a sustainable future is education for the environment. This paradigm has an overtly political element because it embodies a social critique and action for change (Davis, 1998; Herbert, 2008; Pearson & Degotardi, 2009). Children are not regarded as mere recipients of information, but as the agents who bring about change. The future will require more than simply the survival of crises. It will require of each individual to work toward the radical remake of institutions and patterns currently constituting the status quo (Orr, 1992; Davis, 1998; Hebert, 2008; Pearson & Degotardi, 2009).

Of all the educational institutions, ECD may be the easiest to reform (Davis, 1998; Davis et al., 2009). ECD “provides a window of opportunity for nurturing children’s love of nature and the habits, practices, and lifestyles that favour sustainability” (Pramling-Samuelsson & Kaga, 2010: 75). ECD practitioners are likely to present the curriculum in an interdisciplinary and holistic way already, and are already likely to

stimulate children's curiosity and sense of wonder (Davis, 1998; Herbert, 2008; Pramling-Samuelson & Kaga, 2010).

In the effort to enable a generation that is aware of the interconnections and dependencies between various forms of life, it is important to note that children are not like empty vessels needing to be filled up. Rather, children are already richly connected with all life. Ecological learning seeks to make the profound and relational integration with nature (including people) that is already within the child more explicit (Davis, 1998). Often important aspects of ecological learning are prohibited by adults who fail to recognise the importance of ecological learning, or are entrenched in a worldview that emphasizes analytical and rational ways of knowing, reductionism and consumption over a worldview that encourages, through ecological learning, an appreciation of complexity, relationality, experience, quality, indigenous wisdom and other ways of knowing (Herbert, 2008; Hacking, Barratt & Scott, 2010).

The remainder of this section relates to some elements of ecological learning that might be useful in the development of an integrated, ecological approach to ECD. These elements are: beauty, ecological design, food security, relating to nature, and the study of resource flows.

3.4.3.3 *Beauty*

Experiences of beauty, aesthetics and wonder have intrinsic value. Flannery (in Feeney & Moravcik, 1987) describes the intrinsic value of beauty as:

The times when we allow feeling to command our full attention. Aesthetic feeling, because it completely floods consciousness, increases the intensity of feeling. It is feeling with the volume turned up. It does not lead to practical, efficient or productive ends in and of itself. It is its own end (1987: 7).

Children sense with their whole bodies and have not yet created a separation between thinking and feeling. They are fascinated by beauty from a very early age. This can be seen in the selection of a colourful toy, an eagerness to eat beautifully prepared food and the absolute wonder when experiencing nature with its burst of colour, texture, shapes and scents (Feeney & Moravcik, 1987). A beautifully prepared environment nurtures and develops children's innate sense of wonder and appreciation, which in turn helps to foster a love of and sense of belonging to nature (Sutton, 2009).

Taylor (1987) proposes that everything can be art, and that we are unrightfully accepting ugliness as a part of life. Classrooms can be artfully designed, buildings skilfully put together and grounds can be living gardens. This is one of the most important ways to promote holistic and interdisciplinary learning (Taylor, 1987; Fjørtoft & Sageie, 2000; Bell & Dymont, 2008). It is therefore important for teachers to rekindle their sense of wonder and appreciation of beauty in order to share it with children (Sutton, 2009).

Van Damme (1996) asserts that conceptions of beauty vary according to context and culture, and do not suggest an uncritical endorsement of consumerism or Western ideas of beauty. Beauty can also be seen in simplicity or intricate cultural art forms. It is visible in the care with which classroom equipment is handcrafted to be used and looked after by children. True beauty enhances the contextual environment

in which it is located and celebrates the culture and combined efforts that inspired and created it (Van Damme, 1996).

3.4.3.4 *Ecological design*

Schools and pre-schools are often designed as unsightly, lifeless buildings which reflect nothing of the processes of life and nature. This manifests in learner apathy, boredom, vandalism and violence. The response to such behaviour is generally to fortify boundaries, restrictions, walls and locks (Taylor, 1987; Orr, 1994). This increases the disconnection between learning and nature, and integrates ugliness into curriculum and pedagogy.

The destructive impacts of buildings on the environment (both on site and in terms of the life cycle of building materials) are also often ignored. Buildings account for 40 per cent of the world's annual energy and raw material consumption (Du Plessis, 2002; Omar, 2008), use significant amounts of fresh water (Du Plessis, 2002), add to the loss of arable land and biodiversity, and release large volumes of poisonous toxins and greenhouse gasses (Du Plessis, 2002; Birkeland, 2008; Omar, 2008).

Lost educational opportunities and harmful environmental impacts can possibly be addressed by innovative approaches to design and construction. Ecological design is defined by Van der Ryn and Cowen (1996) as "any form of design that minimizes environmentally destructive impacts by integrating itself with living processes". Birkeland (2002) goes beyond minimization of environmental destruction to the concept of 'ecologically positive development', which is "a product, building, system or urban area that leaves the ecological base and public estate better off than if no development had occurred" (Birkeland, 2002, 2009).

Ecologically designed buildings present numerous opportunities for ecological learning as it "brings natural flows to the foreground" and "integrates human purpose with nature's own flows, cycles and patterns" (Van der Ryn & Cowan, 1996: 24). One of the greatest challenges in the endeavour to enhance capabilities for sustainable development is a profound disconnection from nature. Ecological design might be a way to rekindle that connection, starting with the youngest in the community (Orr, 1992; Stone, 2009).

Designing early learning spaces in this way has multiple benefits. Children have the privilege of learning in beautifully designed and constructed buildings that promote interaction with nature and an understanding of one's place within the processes of nature (Taylor, 1987; Orr, 1994). The very walls of the learning space demonstrate an ethos of positive development and ways to create synergies between humans and nature (Stone, 2009). Buildings can also be designed in a demonstrative way to increase learning opportunities embedded in the structure. The ethos of positive development becomes integral to the way in which the building is inhabited – recycling waste and water, minimizing resource use, gardening, composting, growing food and partaking in the cycles of life (Orr, 1992; Davis, 1998; Stone, 2009).

Ecological design does not necessarily require vast amounts of money. Many design principles are free, such as building orientation, use of natural light and ventilation, layout and form. While some

technologies imply higher capital costs (for example solar water geysers or solar roof tiles), decreased operational costs result in long-term savings (Halliday, 2008). Further savings include decreased waste, decreased energy usage, decreased liability, decreased health and social costs and increased productivity and learning (Grobler, 2002; Halliday, 2008; Birkeland, 2008).

Once again, it is important to note that design for sustainability and beauty is true to context and avoids emulating wealthy consumerism (Van Damme, 1996; Worby, 2010). In very poor communities, ecologically designed buildings and grounds demonstrate alternative ways of living that increase the resilience of the community by reducing their dependency upon outside sources of water, electricity and waste removal. An integrated and ecological ECD hub can be a demonstration site for contextually appropriate solutions, and those who are incredulous can see the ways in which small children are engaging with their environment and buildings. The capabilities for sustainable development which are fostered in young children are thus transferred to other community members. This adds to the community's collective capabilities and overall resilience (Worby, 2010).

3.4.3.5 Food

Child development is dependent on multiple factors beyond food and micronutrients, but we cannot ignore the centrality of good nutrition. Nutrition provides the building blocks for brain development. Thus, it has a strong influence on cognitive and fine and gross motor skill development, educational attainment, and psychosocial disorders and is linked to a child's nutritional status along with linguistic and social development and self-regulation. Adequate nutrients are required to support this period of rapid growth and development and therefore even mild nutritional deficits during critical periods of brain development during infancy and toddlerhood could be detrimental (Chilton, Chyatte, & Breaux, 2007: 264).

Addressing issues of child malnutrition and hunger is one of the greatest challenges of ECD – both one a local and global scale. Globally, a child dies every five seconds due to malnutrition-related diseases (Chilton, Chyatte, & Breaux, 2007). One in 10 people in the world are chronically hungry, while more than 1 billion people in the world are obese (Patel, 2007). In South Africa, 17.6 per cent of children under the age of 17 report to be hungry “sometimes”, “often” or “always” because there was not enough food (Statistics South Africa, 2008). Children grappling with chronic poverty, persistent hunger or inadequate nutrition during the first years of their life will always be disadvantaged. Sub-optimal development manifests in poor school performance and inadequate parenting, which perpetuates the vicious cycle of poverty (Chilton, Chyatte, & Breaux, 2007).

Studies find that the most effective way to address hunger in early childhood is through interventions aimed directly at the child, such as nutritious, balanced school meals. Ideally, nutrition programmes should be integrated, combining centre-based nutrition with family nutrition (Chilton, Chyatte & Breaux, 2007; Irwin, Siddiqi & Hertzman, 2007). In poverty-stricken areas, most ECD centres already struggle to make ends meet¹². Serving meals to children on a daily basis is a considerable financial burden and

¹² See section 3.5 on page 69 for the state of ECD in South Africa.

therefore it is imperative to explore cost-friendly alternatives to supermarket shopping (Biersteker & Motala, 2008; Stone, 2009).

Growing food in the ECD hub might be a way to bypass rapidly increasing food prices whilst increasing children's intake of nutritious food on a daily basis. Food gardens promote school meals that are made from fresh, healthy, seasonal ingredients. Children are exposed to a variety of vegetables that might not be served at home. This establishes positive eating preferences and habits in young children (Bell & Dymment, 2008; Stone, 2009). Food gardens might also be a way for the ECD hub to include the broader community through the transferral of gardening skills and knowledge and by involving the community in the cultivation and upkeep of the garden. In this way the nutritional and social benefits of food gardens are extended to beyond the school into the wider community (Fjørtoft & Sageie, 2000; Bell & Dymment, 2008).

On a different level, the planting, growing and nurturing of food is one of the most basic ways to establish deep connections with beauty and nature: "the way we eat represents our most profound engagement with the natural world. It can also be the occasion for deepening our appreciation of that engagement, for the benefit of the natural world and our relationship with it" (Pollan quoted in Stone, 2009:19). Children's participation in the 'process of lunch' (Bell & Dymment, 2008) is a way of transferring hands-on knowledge about nutritious food and the way in which it is produced. It is also a useful way in which children can learn the basic concepts that constitute ecological literacy, such as the flow of energy between the sun, the soil, the seed and the human body (Bell & Dymment, 2008; Stone, 2009). The word 'agriculture' has its origin in the Latin *agricultura*, meaning 'cultivation of the land'. *Cultura*, meaning 'cultivation' or 'the tilling of the land', is the Latin origin of the word 'culture', which is defined as: "the totality of socially transmitted behaviour patterns, arts, beliefs, institutions, and all other products of human work and thought". The etymology of the word 'agriculture' demonstrates that the cultivation of the land is a fundamental part of our human existence, and that the disconnection from the food we eat is a relatively new phenomenon (Online Etymology Dictionary, 2010).

Cultivating crops is a physical activity that helps children to release excess energy while connecting with nature. Learning that takes place in the garden engages all senses simultaneously. Children who do not excel in cognitive classroom learning often become leaders in the outdoors where alternative skills and capabilities are stimulated (Bell & Dymment, 2008; Stone, 2009). Social relations are strengthened as children work towards common goals that require teamwork, cooperation, patience and persistence. Seeing the results of one's work fosters a sense of ownership, pride and confidence (Bell & Dymment, 2008; Stone, 2009).

Another benefit of food gardens is the ability to ground all aspects of the indoors curriculum (science, geography, history, social-studies, mathematics, art and economics) in the practical learning that takes place outside. These subject areas are intricately related to the growing, processing, transporting, marketing, preparation and disposal of food. Food also presents a useful entry point to the fundamentals of sustainability. The food system (local and global) is densely connected to resource use, energy, pollution, water and soil conservation, hunger, trade policy, energy use and climate change.

From a young age, children gain a systemic understanding of the food that they eat every day (Orr, 1992; Stone, 2009)¹³.

3.4.3.6 Nature

The garden is the essential matter. Not the lessons, or the pictures or the talk. The lessons and the talk are about things seen and done in the garden, just as the best of all the paintings in the picture galleries are shadows of the originals - Macmillan (quoted in Littledyke, 2007: 116).

Journalist and nature activist Richard Louv (2008) claims that less time is being spent outdoors and that people suffer from 'Nature Deficit Disorder' as a consequence. He argues that most adults who experience a strong love and commitment toward the preservation of nature developed those feelings as a child, spending unstructured time in a natural setting. According to Davis (1998:19):

Providing opportunities for exploration in the outdoors; playing with water, sand, and mud; collecting fallen leaves; creating habitats for birds and lizards; and gardening are all foundational practices for building responsive and earth-nurturing attitudes.

As children become attuned to the comings and goings of other beings and to their purposeful existence, a relationship with and stewardship towards nature is created (Orr, 1992; Bell & Dymont, 2000; Fjørtoft & Sageie, 2000; Stone, 2009).

A growing body of research confirms the importance of free play in nature for the physical, social, cognitive and emotional development of young children (Titman, 1994; Fjørtoft & Sageie, 2000; Wells & Evans, 2003; Dymont, 2005; Bell & Dymont, 2008). A study conducted by Bell & Dymont (2008) found that the complexity of the school grounds positively correlates with the amount, quality and diversity of play activities that children engage in. Children generally enjoy interacting with physical environmental features which consist of a variety of materials and shapes, smells, textures and weights. Within green spaces there are endless possibilities to make new discoveries, to explore, experiment and imagine (Fjørtoft & Sageie, 2000). The research of Titman (1994) indicates a positive correlation between the design of the school ground and the behaviour and attitudes of children:

Conventional school grounds, by their design, provide a limited range of play opportunities that privilege certain individuals. Expanses of pavement and manicured grass offer opportunities primarily for large group, competitive, rule-bound games. They satisfy some children, but provide few choices for those who prefer to play in smaller groups, who do not wish or are not able to compete, or who prefer different kinds of games which may be more open ended or creative (Titman in Bell & Dymont, 2008: 82).

¹³ Examples of food-based learning and community development projects in South Africa include:

- School's Environmental Education and Development (SEED) (<http://www.seed.org.za/>).
- Umthathi Training Project (<http://www.umthathi.co.za/>).
- Earth Child Project (<http://www.earthchildproject.org/>).

A study of 45 schools in Toronto, Canada, supports this claim (Dyment, 2005). Greening of school grounds was shown to decrease boredom (74 per cent), decrease negative and aggressive play (66 per cent), increase communication and cooperation (63 and 69 per cent respectively) and promote inclusivity in terms of gender, class, race and ability (Dyment, 2005). The findings are relevant for both learners and teachers. Other outcomes include improved concentration and engagement in schoolwork, as well as improved critical reflection.

One of the greatest challenges in the promotion of nature-based exploration and learning tends to be the attitudes of parents and teachers. These attitudes might stem from security concerns (especially in neighbourhoods with high crime rates and busy streets), fears that children might get hurt during play, or the fact that many adults are biophobic and lack environmental competence (Littledyke, 2007; Hacking, Barratt & Scott, 2010). The power of outdoor learning, however, lies in the shared experiences and discoveries of teachers and children. Experiential outdoor education has been shown to change the attitudes of adults who were initially sceptical about the benefits of outdoor learning (Littledyke, 2007). A growing number of 'forest schools' are exploring the value of nature in ECD. Box 3.1 (below) expands upon the forest school movement.

Box 3.1: The Forest School Movement

The forest school movement, which originated in Scandinavia, creates opportunities for interactive nature-based learning alongside mainstream education. As the name indicates, forest schools literally take place in the forest or a similar natural setting. This setting provides numerous opportunities for exploration, discovery and child-led learning (Littledyke, 2007). The area is well defined with clear boundaries and is surveyed to ensure that it is as safe as possible for little children. Following the ethos of the forest schools: ‘there is no such thing as bad weather, only bad clothing’, these excursions occur on a regular basis regardless of the weather conditions. In the forest, the learning is play-based and child-initiated (Knight, 2009).

The outcomes of forest schools include:

- Freedom, time and space to explore independently. This translates into increased levels of self-esteem and confidence.
- Children tend to become more aware of the actions of those around them, and more able to play in a cooperative manner.
- The large variety of visual and sensory experiences encourages sophisticated use of language - both written and oral.
- Increased motivation to explore, learn and discover.
- Improved ability to concentrate on specific tasks for extended periods of time.
- Development of physical stamina and gross motor skills.
- Development of fine motor skills and effective use of tools to make structures and objects.
- A sense of stewardship towards the local environment.
- Heightened ability to make observations regarding natural phenomena such as seasons, light, wildlife and weather.
- Teachers are presented with opportunities to assess children’s learning styles and skills holistically, which in turn influences planning and assessment.
- Trust is fostered between children and teachers, as learning takes place jointly and both parties engage with the same challenges.
- (Littledyke, 2007; Knight, 2009)

3.4.3.7 *Place-based education*

A possible and pragmatic way of addressing the human–nature disconnect is by studying the flow of resources in one’s specific place (Orr, 1992; Lamers, 2008). According to Lamers (2008), there is no better way to understand the complex nature of global forces and flows than to begin by figuring out where one falls within them all. Place-based education encourages teachers and children alike to actively engage with local realities by becoming familiar with the natural features of their place (rivers, hills, valleys, habitat, vegetation, animals) and to formulate an understanding of the interdependencies of humans and nature in their context (knowing where resources – food, water, energy – come from, and where waste goes) (Lamers, 2008). Noddings (2005) suggests that an understanding of place and

the resource flows that connect humans with nature enhances the collective capabilities of communities to care for their place and to communicate their place by telling and listening to stories.

Learning to care for one's place may mean that new habits and lifestyles are adopted. Many of these habits are familiar to those seeking to live sustainably: reducing, re-using and recycling waste, composting organic waste, saving and harvesting water, minimizing electricity usage, growing food and cultivating gardens, eating in a healthy and sustainable manner, finding alternative modes of transport and many more (Marchuk, 2007; Pearson & Degotardi, 2009). Early childhood is the ideal time to internalize these habits and values. Learning which connects the head and the hands, translate into the Aristotelian concept of *phroenesis*, or practical wisdom (Orr, 1992). All of the abovementioned habits are easy to integrate in all areas of the curriculum. Classrooms and school grounds can become exemplars of sustainable living and alternative ways of being (Pearson & Degotardi, 2009; Davis et al., 2009).

3.4.3.8 *The Montessori Method as a possible pedagogy for ecological learning in early childhood*

A number of educational paradigms are conducive to ecological learning in early childhood, of these the Montessori and Waldorf pedagogies are very well known (Edwards, 2002; Sutton, 2009). The scope of this essay does not allow for a full exploration of all the paradigms. The following section briefly explores the possibilities of ecological learning in early childhood within a Montessori educational framework. I have selected this partly because it will be helpful in the interpretation of the case study in chapter 4, and partly because it seems worth noting that the concept of educational systems rooted in nature are not new. The work of Maria Montessori as educationist began in 1907, and Rudolph Steiner in 1919 (Edwards, 2002). For the purpose of this literature review, I focus on the aspects of the Montessori approach that highlight ecological learning, not the method in its entirety.

Introduction to the Montessori Method

Maria Montessori was the first female physician in Italy. After designing a methodology for working with children with disabilities, she started her Casa dei Bambini (children's house) in 1907 for children aged 4 – 7 in a housing project in the poor slums of Rome. She envisioned a system of education which engaged rationality, empiricism and spiritual development. She purposely avoided the abstraction and specialisation of knowledge by working across disciplines (for example combining mathematics and language) in a way that is deeply rooted in nature (Edwards, 2002; Edwards, 2003). The child is conceptualised as a 'spiritual embryo' – the most sacred treasure of humankind – because the spiritual power of every child is needed to transform the world (Miller, 2004). Within the framework of a complex, cosmic worldview, she proposed that all things in the universe are connected to form a whole unity (Haskins, 2008). Montessori education strives to foster in each child a vision of the grandeur and complexity of the universe and each one's personal destiny therein. The purpose of education is not only to stimulate the intellect, but also to nurture the spirit of the child so that he/she can self-confidently step into their lives and fulfil their role in a creative and awe-inspiring universe (Miller, 2004).

The prepared environment

One of the ways in which children's spirits are nurtured is through a classroom environment characterised by beauty, order and simplicity (Edwards, 2003). An orderly environment where everything has a place helps children to gain confidence. Beauty soothes the spirit, and enhances aesthetic appreciation. Beautifully and carefully prepared environments also convey messages of importance, love and appreciation to children. This ethos of care and appreciation is further manifested in the careful handling of equipment and furniture, and in making sure that nothing is broken or incomplete (Taylor, 1978; Feeney & Moravcik, 1987; Mabeba, N, 2010).

The inclination to value and appreciate beauty, and to care for and respect one's surroundings is likely to inform the way in which children relate to and discover nature.

Cosmic education

It seems that Maria Montessori understood that sustainability requires systems thinking (Sutton, 2009). The teaching philosophy is grounded in an understanding of the world as a complex set of interrelated and interdependent phenomena (Miller, 2004; Sutton, 2009). This is reflected in the integrated nature of the curriculum (as opposed to isolated, specialised disciplines) and the commitment to a whole systems approach (Edwards, 2003; Miller, 2004; Sandhu, 2008; Sutton, 2009).

Lessons always commence from the whole before proceeding to the parts. This helps children to connect smaller components of knowledge to the bigger picture and to make links between different pieces of knowledge and disciplines (Edwards, 2003; Sandhu, 2008; Sutton, 2009). For example, when children are taught geography, the teacher might stimulate their imaginations by telling them about the colossal universe with all the stars and planets. Systematically she/he would narrow down the story by discussing our planet earth, its continents, the various countries, provinces, regions and towns. In this way children are able to understand the place that their street, neighbourhood, town, province, country and continent has within the larger planet earth and the infinite galaxy. Learning through stories is supported by the use of "Montessori material", in this case by exploring a sensorial sandpaper globe with the water and the land, later progressing to doing puzzles of continents, countries and provinces. Within this cosmic story the significance of human life on earth is explored, as children discover the importance of their own narrative within the larger story of life (Sutton, 2009; Annecke, 2010; Mabeba, N, 2010).

Interdependence

The Montessori classroom and curriculum mimics the full cycles and interdependent communities of life that are found in nature. In support of the community-based approach to each Montessori class, and within an approach that celebrates the universe in its entirety, there are only three rules:

- Always put an activity away the way you found it.
- Do not hurt others.

- Do not interrupt others.

These are simple measures that make real the golden rule: do not do to others what you do not want them to do to you. In every activity, children are expected to complete the entire process, interacting with the environment and classroom community in a way that at the very least does no harm and at best improves upon it (Sutton, 2009; Annecke, 2010; Mabeba, N,2010).

According to the Montessori philosophy, learning takes place in three year cycles. Classrooms are made up of children spanning an age range of three years. This allows children to progress at their own pace, but also promotes internal cooperation as children learn from each other. It is often the case that a child who has mastered a certain activity teaches another child how to do it (Miller, 2004). Within this three year time frame a strong sense of internal community and interdependence is fostered (Sandhu, 2008; Haskins, 2010).

Independence

The Montessori classroom is designed to be a learner-led learning environment. This implies that the child is largely responsible for the content and direction of the learning (Sandhu, 2008; Haskins, 2010). The Montessori learning materials are designed to be self-correcting so that children can master the activity independently (Edwards, 2003; Haskins, 2010).

The independence granted to the individual child stimulates their intrinsic motivation to learn and concentrate. From her observations, Dr. Montessori deduced that children have an intrinsic desire to engage in meaningful activity, which she termed 'work'. To the child, this is not tiring but energising (Haskins, 2010). Moreover, the learner-led curriculum and self-correcting nature of the learning materials stimulate independence, self-discipline and self-confidence in children. This is vital in the process of enabling capabilities for sustainable development, because children learn that they are capable of independent activity and are prepared to be agents of change in their own lives and communities.

Nourishment for the brain and the spirit

For Dr Montessori, education was as much a spiritual exercise as an intellectual one. She strongly asserted that "the real danger threatening humanity is the emptiness in men's souls; all the rest is merely a consequence of this emptiness" (Montessori, 1974: 44). She asserted that education that prepares children only for mechanical production in the world economy radically diminishes visionary creativity, moral insight and the loving compassion that children's divine energies promise for humanity's problems. If these divine energies are nurtured and enhanced, they can be released into the world as a powerful source of good (Miller, 2004).

As a concluding remark, it is important to note that although the Montessori method was designed approximately 100 years ago by a physician in Italy, the Montessori principles of ecological learning can be translated into simple, practical activities that are appropriate to a variety of contexts. There are Montessori schools in over 110 countries, serving more than a million children (Edwards, 2002). Chapter

4 demonstrates how the Montessori method can also be appropriate to a very poor communities in South Africa.

3.4.3.9 *Summary: ecological learning*

In the light of the polycrisis and the challenges that children will face as they grow up, it is essential to ensure that education prepares children to survive in and transform the future. While mainstream education has been criticised for perpetuating the worldview that brought about the polycrisis in the first place, ecological learning endeavours to develop in children a deep relationship with nature and an ability to appreciate complexity and uncertainty. In this section, the meaning of ecological learning was explained. This was followed by a discussion on the importance of beauty, ecological design, food security, nature, and place-based education as elements which reinforce ecological learning. The Montessori method was identified as one of the possible pedagogies for early childhood ecological learning.

3.4.4 ‘Hubbing’: ECD centres as integrated community-building ‘hubs’

3.4.4.1 *Introduction*

Many of the central principles of ecology are variations on a single fundamental pattern of organization: nature sustains life by creating and nurturing communities. Organisms cannot exist long in isolations. Animals, plants and micro organisms live in webs of mutual dependence. Qualities that keep natural ecosystems vibrant and resilient, such as diversity and interdependence, shape healthier schools and other human communities as well (Stone, 2009:11).

Community development is identified as one of the most appropriate strategies to combat poverty and promote resilience (Hornby, 2005). Monaheng describes community development as a process which promotes human development by “empowering communities and strengthening their capacity for self-sustaining development” (2000:125). According to Kolybashkina, community development aims to:

- 1) “Stimulate local initiative by involving people in the process of social and economic change;
- 2) Build channels of communication that promote solidarity; and
- 3) Improve the social, economic and cultural well-being of community residents” (Kolybashkina, 2005: 5)

Chilean economist Manfred Max-Neef links ecologically sustainable development with the need for ‘Human Scale Development’, which is driven and designed according to fundamental human needs, the achievement of self-reliance and the promotion of ‘organic articulations’¹⁴ (Max Neef, 1992). The 9 fundamental human needs identified by Max-Neef are: subsistence, protection, affection, identity, freedom, leisure, participation, understanding and creation. Fundamental human needs are ‘few’ and ‘unchanging’ (Max Neef, 1992: 199-200). They are satisfied on individual, community and environmental levels. Neo-liberal development promotes individual (or societal) needs at the expense

¹⁴ ‘Organic articulations are defined as the “construction of coherent and consistent relations of balanced interdependence among given elements” (Max-Neef, 1992: 197).

of the environment. This results in unsustainable societies and the long term failure to satisfy fundamental human needs at all levels (Max-Neef, 1992; OLF & SI, 2010).

Max-Neef further emphasises the importance of development that takes place from the bottom-up. Democratic grassroots developmental initiatives embody greater possibilities of meeting fundamental human needs (now and in the future) by ensuring that humans are active and participating ‘subjects’ in development as opposed to ‘objects’ that passively ‘receive’ development. In the endeavour to promote sustainable community development, it is important for communities to reflect upon their fundamental needs and the best ways to satisfy these. Choices of satisfiers should be specific to the lifestyles, systems and structures, strategies and living spaces that contribute to a sustainable community in each context (Max-Neef, 1992; OLF & SI, 2010).

Folke et al. (2002) further links the concept of sustainable development to the resilience of a socio-ecological system such as a community. More resilient communities are able to absorb larger shocks and are better able to cope, adapt and reorganize without sacrificing the provision of ecosystem services. Resilience is further associated with diversity and human opportunities that maintain and encourage adaptation and learning.

Acknowledging the urgent reality of the global polycrisis and a future characterised by uncertainty and complexity, it appears necessary to build individual and community capabilities that promote sustainability and resilience in order to meet fundamental human needs presently and in the future. I suggest that it is vital to include in this endeavour integrated and ecological early childhood development (Orr, 1992; Ball, 2005; Hornby, 2005; Herbert, 2008). I use the term “hubbing” as a verb which refers to ECD facilities that serve as integrated ‘hubs’ seeking to facilitate sustainable community development. ‘Hubs’ promote integration between developmental initiatives, strengthen intergenerational learning, and create spaces where children are central to community development initiatives (Ball, 2005).

The following section explores the concept of “hubbing” by highlighting the experience of three case studies. These case studies were selected because they demonstrate ways in which the concept of an ECD hub is emerging as developmental approach in various international contexts. It also demonstrates the importance of ensuring that sustainable community development initiatives centred on young children are contextually appropriate.

2.4.4.2 Case Study I

The first case study reports the research findings of Jessica Ball (2005) who documented the conceptualisation, development and implementation of ECD in three different groups of First Nations in Canada. These communities had the common goal of “advancing community development by improving conditions for young children and their families” (2005: 21).

The model of ECD employed by these communities entails a conception of ECD programmes as a ‘hook’ for mobilizing community involvement in supporting young children and families, and as a hub for meeting a range of service and support needs of community members:

Co-location of child care with other services enables ready access to health monitoring and care, screening for special services and early interventions. Once parents are involved in bringing a child to a community centre-based program, many learn about and access programs for themselves and other family members. The research showed how multi-purpose community-based service centres can become a focal point for social cohesion and can provide a cultural frame around service utilization that informs external service providers and offers cultural safety for community members (Ball, 2005:2-3).

One of the first steps was to develop certified post-secondary education and skills training programmes, guided by explicit, community-derived goals of supporting the development of the 'whole child' and of keeping the family, community and cultural ecologies of children clearly in focus. These programmes are:

- Caring for Children (basic certification).
- Caring for infants and toddlers (Post-Basic certification I).
- Caring for children with special needs (Post-Basic certification II).

The training curriculum follows a 'community of learners' approach of which elders form an integral part to ensure that the course is culturally and contextually relevant: "In each community, this process has generated community-specific, culturally grounded knowledge and ideas for moving forward with actions to support child well-being" (Ball, 2005: 21). This programme has been more successful than any other post-secondary program in Canada in terms of indigenous student completion rates, community-involvement in training, incorporation of indigenous knowledge, revitalization of intergenerational teaching and learning, and retention of graduates in employment in their communities (Ball, 2005).

One community designed and built an inter-sectoral multiplex to accommodate their integrated ECD programme. The multiplex now accommodates an infant and toddler care centre, a child care centre for preschool-aged children, indoor and outdoor after-school care facilities, a cultural centre, health centre, social service centre, administration offices, community kitchen and community gathering space. It operates on principles of integrated and co-located services which facilitate access to services and also increase parental and community involvement in the centre. The multiplex has created employment for 15 of the graduates from the training programme (Ball, 2005: 28).

3.4.4.3 *Case Study II*

A research project undertaken by Shumba et al. (2008) illustrates the link between ecological learning, education and the community. The research team set out to gain an understanding of the quality, relevance and sustainability content of education found in a community in the Masvingo province in the south of Zimbabwe. The community lives in a context of extreme poverty and quality of life is greatly threatened by a multiplicity of interdependent ecological, social, economic and cultural problems. The quality of education was perceived to be very low, and the daily problems that the school faced were absenteeism (teachers and children), a lack of adequate infrastructure, limited teaching materials and racial tensions. The research team convened a series of meetings where children, teachers, parents and

other members of the community assembled with the purpose of mapping out environment and sustainability issues and practices, proposing and implementing local educational and development projects to deal with those issues and mapping out perspectives on quality and relevance of education. This translated into three questions, namely

- 1) How does a local community understand and make sense of sustainability and its sustainability issues?
- 2) What are the perspectives of the local community on how sustainability issues must be addressed in education and in development projects?
- 3) How does a local community make sense of quality and relevance of education and learning vis-à-vis its sustainable livelihood? (Shumba et. al, 2008: 82–83)

This process had the catalytic effect of stimulating (for the first time) teacher–community engagement where common sustainability goals were identified. These goals, defined collectively by the community, were then incorporated in the educational curriculum. In this way, education served to enhance community efforts, while simultaneously growing in relevance and contributing to a higher quality of education for both children and adults. Another outcome was that it brought about a shift in the perception of education being school based only. The community decided that the school should be a place where children and teachers meet, a community centre where positive ideas can be shared and disseminated, a centre of learning for all (especially elder community members) and a place where the community could meet on days of rest. Instead of the school being a place removed from daily life, the school became a medium for teacher – community cooperation and reciprocation (Shumba et al., 2008).

Even though the study conducted by Shumba et al. was based on a primary school, it seems a logical extrapolation to consider using the same principle in a crèche, where the entire community takes ownership of the building, which in effect becomes a hub of community-based activities.

3.4.4.4 Case Study III

The Raglan Road Community Centre in Grahamstown, South Africa, uses its preschool as entry point to holistic community development. This preschool was established by the Centre for Social Development in 1990 as a child care centre in response to the lack of child care facilities (Hornby, 2005). Teachers soon noted that children and their families were vulnerable due to malnutrition, lack of health care, lack of services resulting in poor quality of life, material poverty, neglect, abuse, HIV and AIDS, poor community and home environments and a lack of capacity and capability of adults in the community (Vallabh, 2007). It was decided to follow an integrated, community-based approach to ECD in order to develop both children and parents in an attempt to address community needs in a holistic and immediate way (Hornby, 2005; Vallabh, 2007; Schäfer, 2010).

The process of departing from a narrow preschool focus to that of an integrated community development hub took four years. In 2000, the preschool changed its association with the Centre for Social Development to that of a partnership and established its own school governing board made up of teachers and parents. The school governing board acted as animator for community development by

in identifying and establishing community projects that would increase community resilience by generating income, reconnecting with culture and heritage and improving skill and knowledge levels in the community (Hornby, 2005; Vallabh, 2007). Strengthening the social fabric in this way contributes to the establishment of a community conducive to holistic child development. The projects included an indigenous herb project, adult literacy and computer training, catering, food gardens, sewing and a service centre for the elderly. With time, new projects were added, such as the bingbee kiosk (a small building with 10 computer kiosks accessed from an outside veranda by way of touch screen technology), community workshops on relevant issues such as HIV/Aids, a conference facility, a toy library and an ECD resource library. The Fingo Village Community Library has recently been built on the premises. This, together with the abovementioned projects, ensures that the Raglan Road Community Centre is a hive of activity during the day (Hornby, 2005; Vallabh, 2005; Schäfer, 2010).

In response to a wider need for qualified ECD practitioners, the Centre for Social Development now presents ECD training courses for:

- 1) Early Childhood Development Certificate (NQF Level 4).
- 2) National Diploma in Early Childhood Development (NQF Level 5).
- 3) Advanced Certificate in Early Childhood Development (NQF Level 6).

A community development practitioner was appointed to assist teachers and parents in the facilitation and coordination of these projects. The transition to an integrated community was often difficult. One of the biggest challenges was the change in institutional arrangements and the fact that teachers were qualified only in education, not in community development (Hornby, 2005; Vallabh, 2005; Schäfer, 2010).

3.4.4.5 Analysis

The three case studies (above) are examples of ECD institutions that try to move away from reductionist conceptions of education and community development towards contextually appropriate, integrated ECD 'hubs' as a pathway to sustainable community development. In all three of the case studies, community developmental goals were collaboratively defined by teachers, parents and community members. Parents and community members became actively involved in the process of improving the quality of education whilst working towards community development goals. The goals, as well as the approach, varied according to context, reflecting the culture, needs and resources of the community and its environment. The three case studies each explored possibilities of ECD centres functioning as 'hubs' to facilitate the initiation and integration of various community development initiatives. These hubs differed from one another – in the first case study the focus of the hub was on integrated service delivery, in the second case study the school hub served as a community gathering and meeting place, and in the third case study, the hub served as central location from which various projects could operate. Only in the second case study is the environmental aspect of sustainable development explicitly addressed. Vallabh (2007), referring to challenges faced by community-based ECD centres, suggests that the contextual nature and embeddedness of integrated ECD programmes might implicitly open pathways to education about and action towards environmentally sustainable development. In the first case study, this might be through active engagement in intergenerational learning, where

community elders transfer knowledge about the local environment, indigenous knowledge and livelihood practices. In the third case study, the involvement of elders and the establishment of indigenous herb gardens and vegetable gardens might serve the same purpose. If an embedded conception of sustainable development is followed¹⁵, where actors realise that all social and economic activity occurs within, and is dependent on, the natural environment, then it follows that environmental issues will be addressed in concurrence with social and economic issues.

From these case studies one can also deduce that there is no 'recipe' for sustainable development. Although the philosophy underpinning the efforts in all three examples are similar, the outcomes differ markedly. The case studies also fail to reflect the initial and ongoing challenges that each project is confronted with. Because community development takes place in a complex socio-ecological system, there are many emergent outcomes which might not be anticipated. Some outcomes are positive, such as the enhancement of social cohesion or synergies between different service delivery sectors. Others, however, might be more challenging, such as antagonism from other community-based organisations due to territorial disputes or competition for limited funding.

Capacity remains a core challenge of developmental work. The three projects described above all attempt to increase community capacity through training, skills development or empowerment. What is often lacking, though, is capacity within the ECD hub. In the second case study, for example, one might ask whether the teachers will be skilled enough to adapt the curriculum to address local environmental and sustainability issues, following the parent-teacher meetings. In the third case study, one might ask what is needed to enable ECD teachers to expand their roles from classroom-based teachers to community development practitioners.

Finally, it is important to consider funding arrangements. The first case study, which is located in Canada, enjoyed sufficient financial support from the Canadian government. The second and third, however, are situated in poverty stricken contexts where government services are unavailable and there are no excess funds within the community. In these instances it often becomes difficult to sustain projects. One solution might be to initiate income-generating projects. In the third case study, the sewing project, the vegetable garden, the catering service and the conference venue generated income, which boosted the financial viability of the initiative as well as providing additional income for community members and parents.

To conclude, I argue that it is essential to develop integrated, contextually appropriate and ecologically orientated approaches to sustainable development that contributes to the welfare and development of children and communities simultaneously. It appears as if ecological learning within an ECD space which serves as a community development hub may be an appropriate way to enhance collective capabilities for sustainable development at a local level.

¹⁵ See section 3.3.2 on page 41 for the embedded model of sustainable development.

3.4.5 Section summary: Early Childhood Development

This section demonstrated the importance of early childhood development in the endeavour to enhance capabilities for sustainable development. Firstly, I highlighted why high quality, integrated ECD is fundamentally important for the optimal and equal development of children. I then proposed ecological learning as a possible framework within which learning for sustainability in early childhood might take place. Various elements of ecological learning were explored, including the importance of beauty, ecological design, food security, exposure to nature and place-based education. The Montessori method was identified and discussed as a pedagogy that might be useful for ecological learning. Finally, I argued for an integrated, ecological approach which extends the scope of ECD beyond the classroom into the community so that ECD might become a hub for sustainable community development.

3.5 ECD IN SOUTH AFRICA

3.5.1 Introduction

As mentioned, in 2002 the African National Congress (ANC) announced their intention to shift development policy towards a developmental state (Yachkaschi, 1998; Butler, 2010; Edighedji, 2010; Swilling & Annecke, forthcoming). In section 2.3, the case was made for the 21st century developmental state which prioritises the creation of ideas, skills and networks which enhances people's capabilities to lead the kind of lives they value, and have reason to value (Sen, 1999). It was further argued that the developmental state would necessitate capabilities for sustainable development that decouples growth from resource exploitation. Integrated and ecologically orientated early childhood development was identified as one of the pathways toward sustainable community development.

At this point in the South African developmental trajectory it is critical to recognise the importance of early childhood development. While government commitment towards high quality early childhood development is expressed (see below), several interdependent challenges are yet to be overcome in order to create communities and towns where children can develop and thrive.

The following section provides an overview of the current state of early childhood development in South Africa. Firstly, the government commitment towards ECD is set out in legal and institutional terms. Thereafter, I present a quantitative overview of the access to ECD in the country and the effects that a lack of access to high quality ECD has on later academic performance. Interdependent economic and capacity challenges are identified as major obstacles in the achievement of universal high quality ECD. In the light of these challenges, a role for civil society is proposed for the support and enhancement of centre-based ECD and ECD training.

3.5.2 Government efforts

The South African government continues to express a strong commitment toward increased access to and improved quality of ECD. The 2009 Medium Term Strategic Framework (MTSF) of the Presidency has two main goals in terms of ECD. The first is universal access to a reception year (Gr. R) by 2014 and

the second is to double the number of students aged 0 to 4 enrolled in early learning institutions. Underlying both these goals is the need to improve the quality of new and existing institutions (Gustafsson, 2010). ECD has also been included in one of the government's short-term anti-poverty measures, the Expanded Public Works Programme (EPWP), with the aim of utilising ECD not only as a fundamental stepping stone for children, but also as a significant generator of career opportunities. Further commitment toward the expansion in access and quality of ECD is the inclusion of ECD as one of the government's Apex priorities¹⁶ (Biersteker, Streak & Gwele, 2008; Motala, 2009).

The National Integrated Plan (NIP) for ECD was released in 2005 with a specific focus on poor and vulnerable children aged 5 and under. According to this plan, all children under five should receive an integrated bundle of ECD services, including primary health care services, birth registration, child support grants and early stimulation which can be accessed via homes, ECD centres or a range of community programmes. Other objectives include training caregivers and educating parents; promoting community development; strengthening institutional resources and capacity building; raising public awareness; and enhancing the demand for ECD (South Africa, 2005; Maaga, 2008; Biersteker, Streak & Gwele, 2008).

The implementation of the NIP for ECD is the responsibility of three government departments, namely the Department of Health, Department of Education and the Department of Social Development (South Africa, 2005). While the NIP is in itself a significant step in the right direction, some issues of concern remain. Firstly, the Department of Education places an almost exclusive focus on five year olds and the creation of a universal Gr. R reception year. While this is important, the responsibility of care from 0 to 4 years is largely shifted to the Department of Social Development (Hornby, 2005). The integration between the three departments is proving to be extremely problematic. Despite setting up an Interdepartmental Committee for Early Childhood Development, no specifications were laid out in terms of budgetary responsibilities or accountability. As a result, ECD seems to be falling through the gaps. The fact that these three departments share the responsibility for ECD indicates, to some extent, the government's perspective of ECD as being situated within a wider community development context (Hornby, 2005). To realise ECD models based on integrated community development models, however, will require a radical reform of state apparatus (Hornby, 2005).

3.5.3 Access to ECD

Enrolment in centre-based care for children aged 0 – 4 increased from 7.4 per cent in 2002 to 16.9 per cent in 2008. In 2009, 646 491 children were enrolled in 13 736 registered ECD sites throughout the country (Statistics South Africa, 2008). Despite the marked increase, enrolment figures remain appallingly low. Access to high quality ECD programmes strongly correlates with household income levels. With 65.5 per cent of South Africa's young children being classified as poor, the exclusion is especially troublesome (Biersteker, Streak & Gwele, 2008). Accurate statistics are difficult to access

¹⁶ In the 2008 State of the Nation Address, former president Thabo Mbeki announced 24 Apex Priorities to be incorporated into the government's Plan of Action. For more information, please refer to <http://www.info.gov.za/otherdocs/2008/Apex-priorities0208.pdf>.

because of their exclusive focus on registered sites which excludes informal day-care centres or gogo's (older women or grandmothers). Gustafsson (2010) estimates that the inclusion of non-registered sites would augment the enrolment figure to 51 per cent.

3.5.4 Effects on further education

The lack of access to high quality ECD partially contributes to the dismal performance of South African learners in international and national studies of learner achievement (Department of Basic Education, 2009). In 2003 literacy and numeracy skills of Gr. 3 learners were tested by the Western Cape Education Department (WCED). Only 37 per cent of children were at or above the standard numeracy level for Gr. 3, only 32 per cent were at the standard literacy level for Gr. 3 and 15 per cent had no reading or writing skills at all. This means that 60 per cent of our children are not up to standard, and that the implementation of high quality ECD is of urgent importance (Biersteker & Louw, 2006)¹⁷.

Secondary education is also faring dismally. In 2008, school enrolment in Gr. 1 was more than double that of Gr. 12. Of the students that remain in school until grade 12, only 62 per cent of full-time students with seven or more subjects passed – a rate that is 3.2 per cent lower than the previous year. Pass rates differ markedly between provinces. In the Western Cape, 78.7 per cent of learners passed in 2008 compared to 50.6 per cent in the Eastern Cape. Of the 6 414 schools in South Africa that offered the National Senior Certificate (NSC) examination, only 8.4 per cent (approximately 539) of schools obtained a 100 per cent pass rate, while 0.5 per cent (approximately 32 schools) scored a 0 per cent pass rate (Department of Education, 2010).

With a low Gr. 12 pass rate, only a handful of students meet the requirements for higher education enrolment. Institutions of higher education in South Africa are also in the midst of a crisis. According to a recent Human Sciences Research Council (HSRC) policy brief:

In 2005 the Department of Education reported that of the 120 000 students who enrolled in higher education in 2000, 36 000 (30 per cent) dropped out in their first year of study. A further 24 000 (20 per cent) dropped out during their second and third years. Of the remaining 60 000, 22 per cent graduated within the specified three years duration for a generic Bachelors degree. [...] The drop-out rate is costing the National Treasury R4.5 billion in grants and subsidies to higher education institutions without a commensurate return on investment. It has since emerged that at some institutions the drop-out rate is as high as 80 per cent. Even when the movement of students between institutions is taken into account, close to 50 per cent of undergraduates drop out. (Letseka & Maile, 2008: 7).

No single reason can be attributed to the predicament that South Africa faces regarding the status of education. Many socio-economic factors, including unqualified teachers, inadequate school administration, poverty, gangsterism, substance abuse, lack of access to basic services, violence and crime are likely to contribute to a lack of academic achievement (Lotz-Sisitka, 2009). Studies have,

¹⁷ Academic achievement is only one of the areas which reflect the quality of ECD. For a full analysis of the long term implications of high quality ECD, please refer to section 3.4.2 on page 46.

however, shown that the early years are fundamental in the development of cognitive abilities that enable future academic success¹⁸ (Esping-Anderson, 2002; Heckman, 2006; Barnett & Ackerman, 2006; McCain, Mustard & Shanker, 2007). A lack of access to high quality ECD puts children at a considerable disadvantage as they enter school. It is clear that a systemic solution is needed to rectify this problem, which starts in early childhood.

3.5.5 Economic considerations

Access to high quality ECD is strongly correlated to higher levels of household income. For the first four income quintiles, the monthly fee per child is less than R100, while fees within the fifth quintile average around R700 per child per month. Higher costs correlate with higher quality institutions, highly trained teachers and professional service delivery, while lower fees are often an indication of poor service delivery and untrained teachers (Biersteker, Streak & Gwele, 2008; Gustafsson, 2010). With no minimum wage for ECD teachers, many of the teachers earn a salary too low to survive on. There is also a significant loss in capacity building investments as trained teachers opt out because of low salaries. This implies that capacity within the ECD sector remains inadequate (Biersteker & Motala, 2008; Motala, 2009). The inequality within ECD provision based on household ability to pay further emphasizes the need for a pro-poor educational strategy.

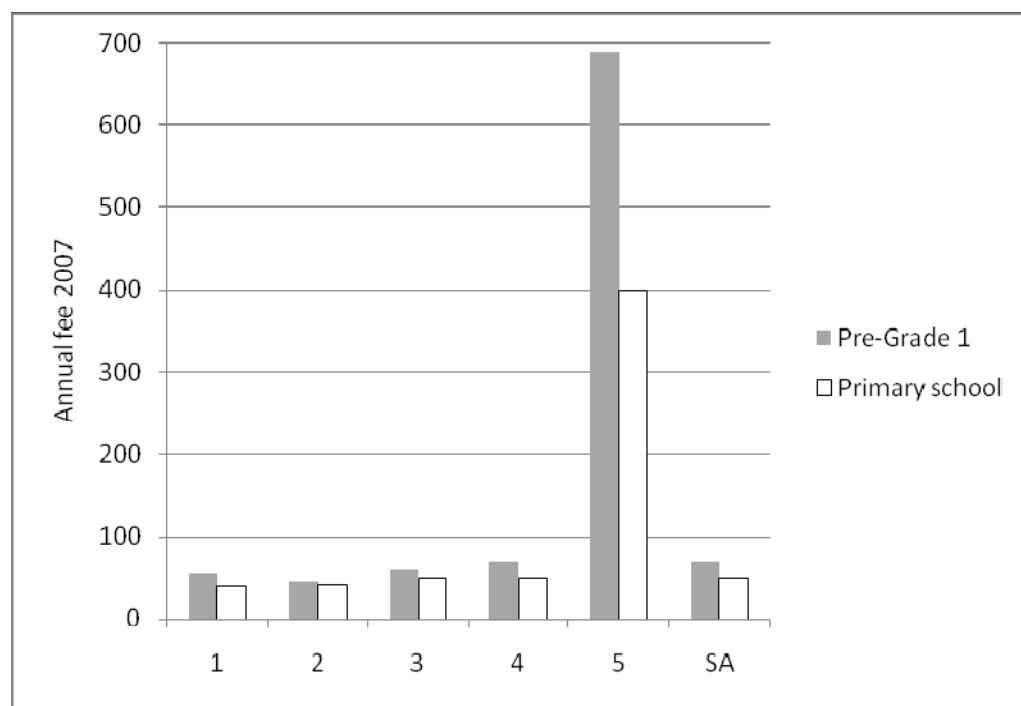


Figure 3.2: ECD fees per income quintile in South Africa.
(Source: Gustafsson, 2010).

¹⁸ See section 3.4.2 on page 46.

The government's response was to create an ECD subsidy of R12 per child per day, accessible to registered centres. This is a significant contribution, and in some cases provides up to 70 per cent of the centre's monthly income (Biersteker, Streak & Gwele, 2008). In a costing study done by Biersteker, Streak and Gwele (2008) it was found, however, that the subsidy covers only 41 per cent of the costs per child per day. The remaining costs had to be made up from school fees, donations and other sources. Fundraising is problematic for many centres in poor areas, because there is no excess money within the community.

A further problem is that the government offers no support in the line of infrastructure or initial material acquisition (Motala, 2009). Only after the centre is registered can the subsidy be accessed and many centres do not survive their first year without external assistance (Motala, 2009). The basic registration requirements include:

- A centre must be a fenced, secure building with toilets/potties for children.
 - A daily menu should be in place.
 - A daily programme, toys and other playing material should be in place for children.
 - Adequate staff is required.
 - Administrative and financial management systems have to be satisfactory.
 - Services provided to the children in terms of physical, emotional, intellectual and social care must be satisfactory.
 - The physical condition of the centre has to be satisfactory.
 - The general functioning of the centre has to be satisfactory.
- (Department of Social Development, 2010)

Meeting these criteria may be difficult for ECD centres with no financial resources and inadequately trained teachers. A further issue is that the fact that subsidies are allocated to centre-based ECD only – other ECD mechanisms, such as home-based care or community care set-ups, are unable to access government support.

One of the greatest challenges at present is the fact that the majority of ECD practitioners are unqualified and underpaid. The growth of high quality ECD in South Africa will largely depend on its ability to generate attractive career options and competent practitioners (Gustaffson, 2010). In recognition of limited government capacity, ECD training is largely conducted in partnerships with NGOs or NPOs, registered as Further Education and Training (FET) institutions. Through the FET colleges, trainees are able to access a stipend from the government, which, ironically, is often much higher than their salary as ECD practitioner. Due to low income trajectories, retention within the ECD sector is very low and investment in capacity building is often lost (South Africa, 2005; Biersteker & Motala, 2008).

3.5.6 A role for civil society

Civil society¹⁹ has an important role to play in the improvement of access to and quality of ECD in South Africa (Jagwanth, 2003). Where state capacity is lacking, partnerships between the state and civil society may be of benefit. Civil society groupings work on different levels of society (from local to global), and can be of benefit to the welfare and development of children in various ways (Irwin, Siddiqi & Hertzman, 2007). On a policy level, civil society can adopt an advocacy role on behalf of children at national and international levels to ensure that policies promote the well-being of children. Grassroots organisations are often useful in mobilizing community engagement in and support for ECD and may be instrumental in the design of local ECD intervention strategies (Irwin, Siddiqi & Hertzman, 2007).

The South African government is aware of the contributions of civil society to the attainment of universal high quality ECD. The Department of Social Development's position paper on early childhood care and development states:

The Department recognises that the ECD sector [...] is largely a developing sector, rather than a formalized sector, requiring support and guidance. The Department has a long and rich history in working with NGO's at different levels and stages and recognises that implementation of any programme requires partnerships with the NGO sector. Recognition should be given to the fact that the major lifeline for the provisioning of early childhood care and development services to communities has been the non-governmental organisations and the private sector (South Africa, 2005: 26).

The document further states that the Department of Social Development has the responsibility of ensuring that ECD provision, support and training by NGOs are of a high quality, and that the necessary funding should be made available to allow for "innovative responses to early childhood care and development" (South Africa, 2005: 27).

3.5.7 Conclusion

The preceding section highlighted the need for universal access to high quality ECD in South Africa, along with the realities associated with the implementation of ECD policies in the country. Firstly, there is a urgent lack of capacity within government to implement government policies successfully. This is mirrored by a lack of teacher capacity at ECD level. This lack of capacity is partially explained by the low income trajectories in the sector and the financial insecurity of ECD centres. Sub-standard ECD is part of the reason for the crisis in education in South African at primary, secondary and tertiary level. In the light of these challenges, it is clear that civil society is important for ECD training, capacity development, centre support, registration and access to funding.

¹⁹ In this paper, the term civil society is used in the broad sense to include all organisations and associations that exist outside the state. This includes non-governmental organisations (NGOs) and non-profit organisations (NPOs) as well as cultural, political, social and religious groupings (both formal and informal) (Jagwanth, 2003).

3.6 CHAPTER SUMMARY

This chapter presented the theoretical findings of this study in the format of a literature review. The findings were organised into four sections. The first section explored the current and future state of the world by highlighting the urgency of the global polycrisis, identifying the neo-liberal development and its underlying modernist worldview as root causes of the crises, and suggesting that mainstream education is teaching children to maintain the status quo rather than to transform it. The second section examined a possible change in the course of development by identifying sustainable development and the 21st century developmental state as important emerging developmental alternatives. I argued for the integration of these two strands of thinking to bring about the enhancement of capabilities for sustainable development. The third section explored ways in which ECD is integral to sustainable community development through the enhancement of capabilities for sustainable development. To this purpose, I firstly outlined the reasons why ECD is fundamentally important for children's development. Subsequently the content of and approach to ECD was discussed, and ecological learning was identified as a possible early learning approach that creates a deep ecological awareness in children and consequently equips them to be leaders in an uncertain future. The concept of 'hubbing' was introduced to demonstrate an integrated, ecological approach to ECD, where the centre effectively becomes a hub for sustainable community development. The fourth and final section gives an overview of the main challenges and potentialities of ECD in South Africa, as a preface for the following chapter.

Chapter 4: Case Study of the Lynedoch Crèche

4.1 INTRODUCTION

The Lynedoch Crèche is situated within the Lynedoch EcoVillage, approximately 30km from Cape Town, South Africa. Thirty-seven, mainly farm-worker, children between the ages of 2 and a half and 5 years attend the crèche. These children have the opportunity to receive high quality early childhood education in an ecologically designed building, to play in the expansive gardens of the Lynedoch EcoVillage, to participate in the growing, harvesting and cooking of organic produce from the community gardens, to be part of the daily comings and goings of an economically and socially mixed community, to interact with older children from the primary school and the youth club and to partake in healing and bodywork (such as tai chi and massage), which are part of the daily routine. Parents and community members are confronted with alternative ways of living through the education of their children, as well as through various workshops, ranging from healing to non-violent communication. The crèche building is shared with the Gr. R (reception year) class of the Lynedoch Primary School (also situated within the Lynedoch EcoVillage) and the Youth Club, which is an after-school facility for children aged 10 to 18. The crèche also serves as an observation centre for the NQF level 4 and 5, and National Diploma level 5 Childhoods Learning programme presented by the Sustainability Institute.

It is important to note that the Lynedoch Crèche is by no means a 'perfect' example of an integrated, ecological ECD hub. Rather, it remains a work in progress and an institution which grapples with gritty daily developmental challenges such as limited resources and a lack of capacity. This, in a sense, is its value – that it is a real, working example of ecological learning, not as an intellectual construct, but in the day-to-day practice of transforming children's experiences of poverty, alcohol abuse, inequality and frequent violence through learning in a place of dignity, beauty and healing. This case study endeavours to describe the Lynedoch Crèche as an element within the wider Lynedoch EcoVillage in order to capture useful learning experiences and discover untapped opportunities that may be helpful to the crèche itself, the Lynedoch EcoVillage and others endeavouring to work in the complex arena of sustainable community development.

This case study adds a practical research element to the pursuit of the research objectives set out in Chapter 1, section 1.3²⁰. In this sense, the case study balances and supplements the theoretical argument of the literature review in the intricacies of praxis, as demonstrated by an integrated, ecologically orientated approach to ECD within the Lynedoch EcoVillage in the Western Cape, South Africa.

²⁰ The research objectives are:

- 1) Determine whether ECD presents a useful entry point for sustainable community development.
- 2) Determine what an integrated, ecologically oriented approach to ECD might entail.
- 3) Reflect on the benefits and limitations of such an approach.

To start with, a description is given of the context within which the Lynedoch Crèche is embedded. Thereafter, the physical building and grounds of the Lynedoch Creche is described, highlighting the important role that ecological design and integration with nature plays. The food system of the Lynedoch Crèche is examined, followed by a description of the content and approach to ecological learning. The Lynedoch Crèche positions itself as an ecological hub for sustainable community development. The ways in which this is achieved are described, followed by an overview of the financial and institutional arrangements. Sections 4.3 to 4.7 are concluded with a set of ‘learning points’ that are structured according to the three research questions of this study²¹. These learning points draw together learning from the literature review and the practical research that relate to each section, with the purpose of answering the study’s research questions. A tentative way forward, derived from the process of an Appreciative Inquiry, is presented in the final section.

4.2 SETTING THE CONTEXT

4.2.1 Introduction

ECD as integrated hub for sustainable community development requires a grounded understanding of the local community and social environment. This section describes the Lynedoch Valley and gives an overview of the history, philosophy and principle features of the Lynedoch EcoVillage within which the Lynedoch Crèche is embedded. The socio-economic challenges of this wine-making region are explained as introduction to the circumstances of the children of Lynedoch.

4.2.2 The Lynedoch Valley

The Lynedoch valley is situated in the Cape Winelands District, an area well known as tourist destination, with picturesque mountains, vineyards and export quality wines. It is a peri-rural area encompassing approximately 86 square kilometres. The vegetation of this bioregion was originally characterised by renosterveld (shrubby vegetation, mainly dominated by renosterbos – *Dicerothamnus rhinocerotis*) (Hase et al., 2003). This has now mostly been replaced by chemically farmed vineyards, fruit orchards, strawberry farms and pastures. Due to urban pressure, two golf courses, a shopping centre, restaurants and housing estates have been added. Chemically-based farming practices and urban development are detrimental to the region’s biodiversity, as well as human and environmental health (Hase et al., 2003; Swilling & Anneck, 2004)

The regional economy is built primarily on the white-owned winemaking industry. The legacy of this industry, however, is its instrumentality in the systematic exclusion and disenfranchisement of black people in the area prior to democratization in 1994 (Giarelli, 2009). A hundred year lease on most commonage land in the district was strategically renewed prior to 1994 with the basic intention of

²¹ The three research questions are:

- 1) Is ECD a useful point of entry for sustainable community development?
- 2) What might an integrated, ecologically orientated approach to ECD entail?
- 3) What are the benefits and limitations of using ECD as entry point for sustainable community development?

preventing land reform. Land ownership, housing and good quality education were largely reserved for whites since the advent of agriculture in this region (Annecke & Swilling, 2004).

4.2.3 The Lynedoch EcoVillage

The seven hectare property that is now the Lynedoch EcoVillage was purchased in 1999 by the Lynedoch Development Company. Mark Swilling and Eve Annecke both served on the board along with Sharifa Ismail (a professional accountant) and Robert Davids (a development consultant), as well as community members Ross van Niekerk and Grantham Jansen. Jansen chaired the board. At the time, the land was occupied by informal settlers and was rife with drug and alcohol abuse. The vision of the board was to develop the land into a community that served as “an explicit intervention to demonstrate in practice an alternative to the power and social relations that have shaped the history of the Cape Winelands” (Swilling & Annecke, 2006: 318).

Three goals were formulated to guide the planning and implementation of this project:

- 1) Lynedoch EcoVillage should be a socially mixed community (both in terms of race and class), organised around a child-centred learning precinct.
- 2) It should strive to be a working example of a liveable ecologically designed urban system.
- 3) It should be a financially and economically viable community that would not require external funding to sustain itself (Swilling & Annecke, 2006: 318; 2004: 3)

In a descriptive brochure, the vision is articulated as follows:

Above all else, the Lynedoch EcoVillage must provide a safe space where South Africans from all backgrounds can live in peace with each other and in harmony with nature. It must also be a place where people from all over the world can come

Box 2: People of Lynedoch [1]

Eve Annecke is the founding director of the Sustainability Institute. She is a specialist in Montessori ECD and leadership development. Other roles include being a wife, mother and community member of the Lynedoch EcoVillage.

Mark Swilling is the academic director of the Sustainability Institute and founder of the BPhil and MPhil programme in Sustainable Development Planning and Management at the School for Public Management and Planning, Stellenbosch. He is also a husband, father and community member of the Lynedoch Eco-Village.

Both Annecke and Swilling were executive directors of the Spier group that helped the company to align its values strategically, according to the new South Africa and global sustainability challenges. The Spier Group was instrumental in the acquisition of the Lynedoch EcoVillage property, the establishment of the Sustainability Institute and the building of the Lynedoch Primary school. A strong relationship remains integral to the success of both institutions within the Lynedoch Valley (Annecke, 2010; Swilling, 2010).

and share in the life of the community while they learn, think, and create works of art and knowledge that will contribute to the making of a better world. It must, above all else, be a place where all life is celebrated and beauty in all its forms treasured for this and future generations (Swilling & Annecke, 2004: 4).

The Sustainability Institute (SI), which is located in the Lynedoch EcoVillage, was established as a non-profit trust in 1999. It is an international centre of living and learning, focussing on studies and experience of ecology, community and spirit (Swilling & Annecke, 2006 Sustainability Institute, 2010). It serves as animator of the design innovation, institutionalization and community building processes at Lynedoch. A programme of learning for sustainability was established in partnership with the School of Public Management and Planning (SOPMP) (now the School of Public Leadership) at the University of Stellenbosch. Out of this partnership Masters and PhD Programmes in Sustainable Development were developed. Other learning areas include sustainable community development, project facilitation to establish sustainable neighbourhoods, the Childhoods Learning Programme, sustainable agriculture, and policy research in sustainable development (Swilling & Annecke, 2004; Swilling & Annecke, 2006; Sustainability Institute, 2010).

Approximately ten years later, Lynedoch EcoVillage includes the following features:

- The Lynedoch Primary School (Gr. R – Gr.8), which serves approximately 300 children from local farm-worker families. This is a non-fee-paying public school, administered by the Western Cape Department of Education.
- The Lynedoch crèche for up to 40 children. The crèche shares a building with the Gr. R class of the Lynedoch Primary School.
- An ecologically renovated main building with a large multi-purpose community hall, which accommodates the Sustainability Institute and the Lynedoch Primary School.
- Offices and classrooms for the Sustainability Institute.
- The historic Drie Geuwels Hotel which was converted into the Lynedoch Guest House and a conference venue.
- A mixed-income and mixed-racial ecologically designed housing development with 16 houses, expanding to 38 in the first phase.
- Ecological innovations that demonstrate practical, cost-efficient ways of sustainable living, such as:
 - sustainable construction and renovation,
 - ecological design,
 - a solar powered street lamp,
 - solar water geysers and solar roof tiles,
 - a wind turbine,
 - waste separation at source, and
 - on-site waste water treatment and recycling by means of Biolytix and a vertically integrated wetland system.

- Community food gardens laid out in accordance with permaculture principles, and an organic seedling nursery.
 - An emerging forest.
 - An organic land reform farm in partnership with the Spier Wine Farm.
 - Commercial space for offices or small manufacturers and crafters.
 - Various small business development initiatives.
 - Limited traffic and a secure environment for children and pedestrians.
- (Swilling & Annecke, 2004; Swilling & Annecke, 2006; Sustainability Institute, 2010; Mannel, 2010; Annecke, 2010; Swilling, 2010).

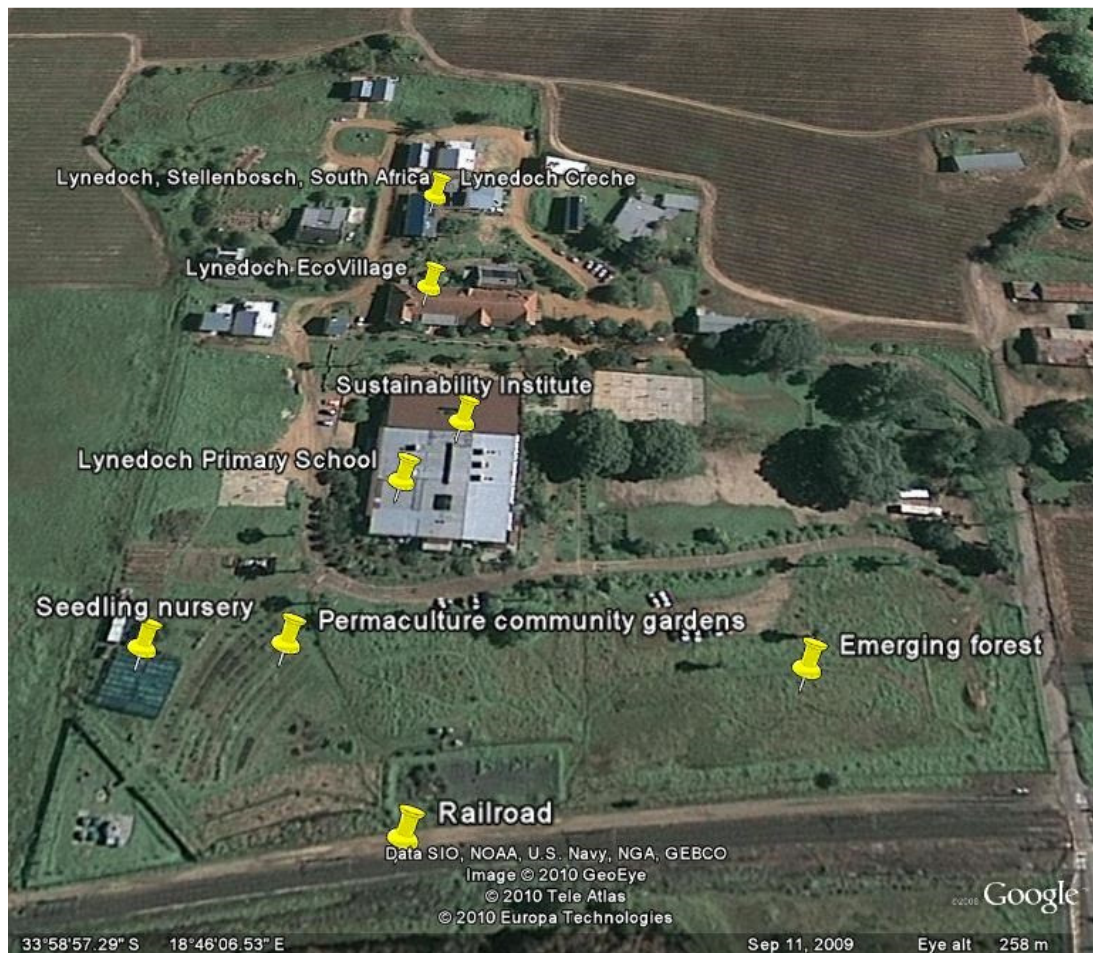


Figure 4.1: Aerial view of the Lynedoch EcoVillage
(Source: Google Earth, 2010).

4.2.4 Children's realities in a wine-making district

The centrality of the Lynedoch Primary School, the Lynedoch Crèche and the Youth Club ensures that there is a constant buzz of children's activity at the Lynedoch EcoVillage (Swilling, 2010; Bezuidenhout, 2010, Van Niekerk, 2010). The majority of these children were born into farm-worker families on the surrounding wine farms. Farm-worker communities are characterised by abject poverty. Permanently employed farm workers earn as little as R800 to R1000 per month (Van Niekerk, 2010). Many people are employed as seasonal workers only and face unemployment during off-seasons (Van Niekerk, 2010; Mabeba, N, 2010; Mannel, 2010).

The Cape Winelands is notorious for high levels of alcohol abuse. This is largely a consequence of the 'dop system', whereby a portion of farm-worker salaries used to be paid in alcohol. Although this practice is now illegal, alcohol dependency and patterns of alcohol abuse persist. Cheap and abundantly available liquor in the area perpetuates vicious cycles of alcohol abuse (Viljoen et al., 2005; Gray et al., 2009; Giarelli et al., 2009; Van Niekerk, 2010; Mabeba, N, 2010).

Alcoholism is often closely related to violence, abuse (physical, verbal or emotional) and crime (Barnwell, Borders & Earleywine, 2006; Philips, Matusko & Tomasovic, 2007; Van Niekerk, 2010; Mabeba, N, 2010). These are tangible realities for the children of Lynedoch. Naledi Mabeba (2010) recounts:

When I first came here, it seemed as if the children were constantly fighting. I was horrified. I said: "how can you let the children fight like that?" and Ross would say: "they are not fighting, they are just playing!". I couldn't understand how they could just leave the children to fight like that. I did not realise that the children were reflecting that which was happening in the community. When grown-ups drink together, they get drunk and then they start fighting. The children play out the things they see as games, because for them it is a way of living (Mabeba, N, 2010).

Another legacy of the 'dop system' is the high prevalence of Foetal Alcohol Syndrome (FAS). FAS is defined as:

Box 4.2: People of Lynedoch [2]

Ross van Niekerk was the principal of the Lynedoch crèche from 2002 to 2009. She is currently an assistant ECD trainer in the accredited ECD training programme of the Sustainability Institute. She was born in Vlottenburg, one of the neighbouring communities, and is now a home-owner in the Lynedoch EcoVillage.

Naledi Mabeba is a Montessori ECD practitioner and trainer. She heads the accredited ECD training programme of the Sustainability Institute. Originally from Johannesburg, she moved to Lynedoch permanently in 2002 to help establish the ECD training programme and to stabilize the crèche.

Mabeba, Annecke and Van Niekerk are invaluable as advocates for children at Lynedoch. With these three women on the board of the LDC, it is no coincidence that the Lynedoch EcoVillage has such a strong a children-centred focus (Annecke, 2010; Van Niekerk, 2010; Mabeba, 2010).

A pattern of anomalies and developmental deficits in children who were exposed prenatally to large amounts of alcohol. Children with FAS have a characteristic pattern of facial and body dysmorphology and delayed physical growth and development, as well as specific mental and behavioural deficits (Viljoen et al., 2005: 594).

Developmental disabilities and behavioural problems may include fine and gross motor problems, hyperactivity, intellectual disabilities, verbal and learning problems, language disorders, emotional difficulties and impairment of information processing (Giarelli et al., 2009; Gray et al., 2009). In 2000, the prevalence rate of FAS in the Cape Winelands was between 40.5 and 46.4 per 1000 (Giarelli et al., 2009; Grey et al., 2009) and in 2005 the rate was 65.2 – 74.2 per 1000 (Viljoen et al., 2005). This can be compared to an average of 0.1 per 1000 in the developed world, and 0.33 – 2.2 per 1000 in the USA (Giarelli et al., 2009). Viljoen et al. (2005) describe drinking patterns in the Cape Winelands as binge drinking, which peaks on weekends.

Alcohol dependency and FAS tend to create vicious cycles. Children with FAS find academic work difficult. This results in a high repeat and drop-out rate from secondary school. With no academic qualification or skills, many children start working as farm labourers. As they assimilate into a culture of poverty and alcoholism, many girls become pregnant and give birth to children with FAS. With both mother and child suffering from FAS, the cycle is perpetuated (Mabeba, N, 2010; Van Niekerk, 2010; Brooks, 2010).

4.2.5 Section Summary

This section established the context within which the Lynedoch Crèche is embedded. Firstly, attention was drawn to the dichotomy between the heritage of a world class wine-making industry and the silent legacy of farm-worker exploitation and disenfranchisement in the Lynedoch Valley. Thereafter, the endeavour of the Lynedoch EcoVillage to demonstrate alternative ways of living and learning based on principles of racial and social integration, ecological sustainability and economic viability was described. Finally, the socio-economic realities for children growing up in farm-worker communities were explicated. From birth, these children are faced with FAS, alcohol abuse and abject poverty.

4.3 PHYSICAL DESCRIPTION

4.3.1 Introduction

The Lynedoch Crèche seeks to be an example of sustainability-in-practice (Mabeba, N, 2010; Annecke, 2010; Van Niekerk, 2010). Ecologically designed buildings, sustainable resource flows and access to natural gardens are understood to be integral to hands-on, participatory ecological learning in a beautiful environment (Annecke, 2010; Mabeba, N, 2010; Van Niekerk, 2010). Conceptualising the Lynedoch Crèche as a hub for community development implies that children of all ages, parents and other community members are included in the learning process. This section describes the ecologically designed building of the Lynedoch Crèche and the gardens and grounds of the Lynedoch EcoVillage with

the intention of exploring their impact on integrated, ecological ECD and the establishment of the Lynedoch Crèche as hub for sustainable community development.

4.3.2 Ecological Design

The Lynedoch Crèche building is an ecologically renovated structure (completed in June 2009) that is situated at the centre of the Lynedoch EcoVillage. The crèche shares the building with the Gr. R class of the Lynedoch Primary School and the Youth Club. Renovations were done in accordance with the ecological design principles and code of conduct of the Lynedoch EcoVillage (Worby, 2010; Swilling, 2010; Annecke, 2010; Van Niekerk, 2010). Funding for the renovation of the original building was made available by two social and business entrepreneurs – Sally Wilton and Teresa Graham – who have come to know the work of the Sustainability Institute intimately. This renovation had a knock-on effect of releasing the building that had been used by the crèche to rent as office space for the OLIVE LEAF Foundation²². The farm house, which had been used for offices, was thus made available for the accommodation of students for the Sustainability Institute’s accredited ECD training²³ (Annecke, 2010).

The original building was in a state of severe disrepair. With a small budget, architect Malcolm Worby²⁴ was contracted to renovate this building into a wonderful space for young children. The main goals were to ensure that the building would be completely healthy (free of toxins), energy efficient, and environmentally friendly (Worby, 2010).

Sustainable construction often requires an ability to re-use what is already there (Van der Ryn & Cowan, 1996). This strategy is both cost-efficient and ecologically sensible. The low-fired clay bricks from the original structure were re-used for the walls and levelling of the ground, and all the windows were reclaimed. A ceiling was built in the high roof which served the dual purpose of creating extra space (now used as the youth club’s clubhouse), as well as providing additional insulation (Worby, 2010). Other measures to improve energy efficiency include wall and roof insulation made from recycled plastic, and overhangs on the north-eastern side of the building, which protect the building from the harsh summer sun. Solar roof tiles enable the building to generate enough electricity to sustain itself during the day. Only environmentally friendly paints and building materials were used to create a healthy environment for children (Worby, 2010; Skosana, 2010; Mawabo, 2010). The lower level interior includes spaces for learning, child-friendly bathrooms and a small kitchen where the meals are prepared. A large veranda allows children to eat, play and learn outside on a sunny day. The space for greenery is relatively small and not yet fully established. It does, however, allow children to play in a natural landscape fortified with stepping stones, logs and trees to climb.

Local labour was used to ensure that the project benefited the local community. Elijah Skhosana and Siphondo Mawabo are two of the men who were employed as construction workers. With no former

²² See section 1.2 (page 17) and 1.3 (page 18) for more information about the OLIVE LEAF Foundation.

²³ See section 4.6.6 on page 101.

²⁴ Malcom Worby is the founder of *Malcolm Worby Designs: Sustainable and Natural Building & Energy Design Consultants* based in Somerset West, South Africa. For more information, please consult their website: www.malcolmworby.com.

experience of sustainable construction, they were mentored and instructed by Worby. The transferral of skills through hands-on training augmented the outcomes of this project beyond a renovated building to the expansion of capabilities for sustainable development. With the help of the Sustainability Institute, Skhosana and Mawabo have started their own sustainable construction business called Siqalo Eco Builders CC that is now registered with the National Home Builders Registration Council (Skosana, 2010; Mawabo, 2010; Mabeba, P., 2010).

Ross van Niekerk, former principal of the Lynedoch Crèche, often took the children to the construction site of the new crèche and other buildings to learn the principles of ecological design and sustainable construction. The learning that took place on the construction site could then be expanded upon inside the classroom by connecting sustainable construction with other principles of ecological design, the sourcing of materials, resource flows and natural resources (Van Niekerk, 2010).

Research indicates that ecologically designed buildings can have multiple positive effects, such as increased levels of motivation and satisfaction, on learning and behaviour of teachers and children²⁵ (Taylor, 1987; Orr, 1994; Bell & Dymont, 2008; Stone, 2009). The Lynedoch Crèche's building is a living example of sustainability-in-practice where children (from the crèche, Gr. R class and Youth Club) can learn about "Reducing, Recycling and Re-using", water and energy conservation, interaction with nature, heat flows and ventilation (Van Niekerk, 2010; Mannel, 2010). The centrality of the building in the EcoVillage facilitates learning, not only for the children, but for the entire community. Children also relate their experiences to their families, and parents share the experience when they come to the crèche. This is in line with the wider commitment of the Lynedoch EcoVillage to demonstrate sustainable ways of living and learning that are beneficial and attainable for the poor (Annecke, 2010; Swilling, 2010).

4.3.3 Gardens and Grounds

Within the Lynedoch EcoVillage large areas are dedicated to greenery: community food gardens, a small forest, small ponds, shrubbery, lawns and indigenous gardens. Studies indicate that unstructured play in natural settings (as opposed to typical school yard profiles such as manicured lawns or concrete slabs) is beneficial for physical and motor development, imaginative play and cooperation amongst peers (Bell & Dymont, 2008; Fjørtoft & Sageie, 2008). Outside play has also been shown to improve children's concentration (Titman, 1994; Wells & Evans, 2003; Bell & Dymont, 2008)²⁶. Since one of the effects of FAS is severe concentration difficulty (Viljoen et al., 2005; Giarielli et al., 2009), the utilisation of green spaces in the Lynedoch EcoVillage might be one way to help children to adapt successfully to the classroom situation (Van Niekerk, 2010; Mabeba, N, 2010).

Beyond developmental support, gardens also present opportunities for children to engage with nature and to become attuned to the existence of other forms of life (Bell & Dymont, 2008; Fjørtoft & Sageie, 2008). The enhancement of capabilities for sustainable development rests upon a deep appreciation of

²⁵ See sections 3.4.3.3. – 3.4.3.7 on pages 53 - 60.

²⁶ See section 3.4.3.6. on page 57.

life, a relationship with nature and a love for the natural environment. Exploration, discoveries and observation help children to form deep relationships with nature (Orr, 1994; Davis, 1998; Louv, 2008; Herbert, 2008).

From personal observations and interviews (Mabeba, N, 2010; Van Niekerk, 2010; Mannel, 2010), it appears that the full potential for ecological learning in the natural spaces of the Lynedoch EcoVillage is not currently being realised. Although children do access the gardens from time to time, the importance of deep immersion in nature is yet to be integrated into pedagogy and curriculum.

On a practical level, the lack of time spent in the gardens may be attributed to the difficulty of supervising children in a large area with only two adults, or the fear that children will get dirty (Mannel, 2010). On a deeper level, however, it seems that this is a symptom of adult disconnection with nature, whereby adults (teachers) experience taking children outdoors as a 'chore'. It might also be that intellectual work that takes place indoors is understood to be more important than outdoors learning (Annecke, 2010; Mabeba, N, 2010).

Of primary concern, therefore, is reawakening the teachers' connection with nature in order for teachers to understand the importance of outdoor play and learning. In forest schools, for example, outdoor play and learning is seen as such an important part of ECD that a certain portion of every day is spent in a forest or other natural setting – regardless of the weather²⁷ (Knight, 2009). The Lynedoch EcoVillage has many spaces which can be transformed into a type of forest school. Without claiming that forest schools are the only or perfect way to achieve nature-based learning, some of the principles and practices from forest schools may be used to increase the depth and impact of ecological learning at the Lynedoch Crèche.

4.3.4 Learning points

The following learning points are structured according to the three research questions of this study, and draw together learning from the literature review and the practical research relating to the subject of this section.

1. How could the physical features of an ECD hub contribute to sustainable community development?

- Ecologically designed ECD hubs with natural spaces could serve as demonstration sites and information points for alternative and sustainable ways of living and learning.
- Connections between humans and nature could be reinforced through time spent in natural spaces.
- Ecological buildings and systems could be used as entry point for discussions on reducing, recycling and reusing, resource flows, water and energy conservation and natural resources.
- Ecological design supports the growing sustainable construction industry and enhances community capabilities for sustainable development by using local labour, increasing skill levels and creating jobs.

²⁷ See section 3.4.3.6 on page 57.

2. What might the physical features of an integrated, ecologically orientated approach to ECD entail?

Integrated, ecological ECD hubs may be housed in ecologically designed or renovated buildings that enhance environmental well-being, use local resources and save money in the long-term. The built environment, therefore, facilitates interaction with and learning from nature. Ample green spaces are conducive to play, exploration, discoveries and physical development.

It is important to note, however, that costly state-of-the-art ecological buildings and expansive gardens are not fixed requirements. It is of greater importance to demonstrate ecological ways of living and learning that save money, use locally available resources and facilitate in-depth, practical learning for both children and adults.

3. What are the benefits of this approach?

- *Financial:* many elements of ecological design are free, such as building orientation, natural lighting, or ventilation. Ecological solutions that rely on renewable energy and recycling of resources save money in the long-term.
- *Ecological:* ecological design highlights the interdependence between humans and nature and benefits the natural environment.
- *Community:* community perceptions about construction, resources and nature are challenged by a space that demonstrates alternative ways of living and learning.
- *Education:* Ecological learning in nature takes place effortlessly for both adults and children.

4. What are the limitations of this approach?

- Certain environmentally friendly appliances such as solar water geysers or solar roof tiles have high capital costs. While they save money in the long-term, the high initial costs may be unattainable for many ECD hubs.
- Adult attitudes and perceptions may deter children's playing and learning in nature. This may be due to the fact that they themselves are disconnected from nature, or perceive intellectual classroom stimulation to be superior to outdoors learning.

4.4 Food

4.4.1 Introduction

Consistent access to nutritious food is vital for a child's cognitive and physical development (Chilton, Chayatte & Breaux, 2007; Irwin, Siddiqi & Hertzman, 2007). In addition to its nutritional value, food intimately connects humans and nature. The cultivation and preparation of food also promotes practical learning about nature's systems and cycles, the flow of resources, economics, science, the environment and sustainability²⁸. This section describes the food system of the Lynedoch Crèche and analyses the relationship between food, nutrition, ecological learning, and the local economy. Suggestions for a more ecologically and financially sound food system are made. The intention is to

²⁸ See section 3.4.3.5 on page 57.

demonstrate the importance of food for an integrated, ecological ECD hub, seeking to enhance community capabilities for sustainable development.

4.4.2 The food system of the Lynedoch Crèche

The children at the Lynedoch Crèche receive two nutritious meals per day. Table 4.1 (below) presents a typical week's menu:

Table 4.1: Weekly menu of the Lynedoch Crèche

	Monday	Tuesday	Wednesday	Thursday	Friday
Breakfast	Jungle Oats with milk and sugar	Maize meal porridge with milk, margarine and sugar	Jungle Oats with milk and sugar	Maize meal porridge with milk, margarine and sugar	Jungle Oats with milk and sugar
Snack	Apple	Orange	Apple	Orange	Apple
Lunch	Brown lentil pie with mashed potatoes and cheese. Mixed vegetables	Cabbage stew with sweet carrots and brown rice	Tin fish stew with brown rice and mixed vegetables	Spaghetti bolognaise with sweet-corn, peas and carrots	Roast chicken, baked potatoes, coleslaw and mixed vegetables

(Source: Gelant, 2010)

Food is primarily sourced from supermarkets such as Pick & Pay or Shoprite. Shopping is done after hours by the principal (Suelle Mannel). The average monthly cost of food is approximately R3 000. Tuition fees are R50 per child per month, with an additional R100 per month per child that attends the aftercare. Total average income from tuition fees²⁹ is R2 231, which covers only 74.4 per cent of the money needed to buy food (see box 4.3 below). The remainder of the money (R769 per month) must be externally sourced (Lynedoch Crèche Budget, 2010).

Box 4.3: Food Costs of the Lynedoch Crèche (Rand)

Average total income from tuition fees per month: R2 231

Total cost of food per month: R3 000

Percentage of food costs covered by tuition fees: $(R2\ 231/R3\ 000) \times 100 = 74.4$ per cent

Additional funds required per month: $R3\ 000 - R2\ 231 = R769$

(SOURCE: adapted from: Lynedoch Crèche Budget, 2010)

²⁹ The figures are averages of data from January to August 2010 as presented in the 2010 financial statements (see Appendix D, page 126).

The crèche also grows food in the community garden, as well as in the crèche's own vegetable garden, which was recently laid out by teachers and children using old car tyres and fertile soil from the community composting project (Mannel, 2010). Children are actively involved in the process of growing, harvesting and preparing the food (Gelant, 2010; Van Niekerk, 2010; Mabeba, N, 2010; Mannel, 2010). In the 'practical life' area of the Montessori classroom there are small vegetable peelers, grates and knives, suitable for use by young children. They prepare the food with glee, feasting on titbits as they progress (Gelant, 2010; Mannel, 2010).

4.4.3 Food based ecological Learning

Ecological learning is based on an understanding of natural systems and flows. One way to do this is to involve children in the entire food cycle: preparing the soil, planting, nurturing, harvesting, preparing, cooking, eating and composting the organic waste (Bell & Dymment, 2008; Stone, 2009). In so doing, children acquire practical knowledge about nutrient cycles, weather patterns and soil structure. They also learn about nutritious food and healthy eating patterns while they become skilled at cooking and using kitchen tools (Van Niekerk, 2010; Mannel, 2010; Mabeba, N, 2010).

Ross van Niekerk (former principal) recounts a time when the children in her class refused to eat spinach. In response, she decided to help the children to plant their own spinach. The children eagerly watched the spinach grow, watering and caring for it until it was time to harvest the spinach. Everyone helped to wash the produce carefully, cut it into small pieces and cook it. That lunchtime, for the first time, every child ate the spinach on his/her plate with gusto. Ross is certain that the children enjoyed eating the spinach because they were intimately involved throughout the entire process (Van Niekerk, 2010).

Powerful learning takes place in the food garden and in the kitchen (Stone, 2009). One child, for instance, became adamant about eating only healthy food. His mother was astonished by the way in which her child refused to eat any candy or fast food (Mabeba, N, 2010; Van Niekerk, 2010). At the insistence of their children, parents now send healthy snacks, such as fruit or sandwiches, to school. Parents wishing to learn more about food gardens are welcomed at the crèche to learn how it is done (Mannel, 2010; Van Niekerk, 2010).

4.4.4 Analysis

Connecting with nature through food is an important part of integrated ecological learning, and Lynedoch crèche does well to encourage children's participation in the cultivation of crops and the preparation of meals. The fact that such a large volume of food is purchased from supermarkets, however, is disquieting for several reasons. Firstly, the full potential of food gardening is not exploited. Secondly, purchasing food from supermarkets effectively means that community financial resources leave the local economy, and thirdly, fruit and vegetables from supermarkets are hardly ever organic or regional.

The following suggestions are made to improve the food system of the Lynedoch EcoVillage – both financially and ecologically:

Firstly, the crèche can grow more food. This saves money which would otherwise have left the system. Seedlings can be purchased from the organic nursery in the Lynedoch EcoVillage. This supports a small business run by local community members. Selling surplus vegetables or herbs may provide an additional source of income to the crèche.

Secondly, the crèche can explore alternative ways of acquiring food. Within the Lynedoch bioregion, there are several possibilities, which include:

1) Eric's organic farm

Eric Swarts, a community member of the Lynedoch EcoVillage, farms organically approximately 2km from the Lynedoch EcoVillage. He is willing to supply fresh, seasonal, organic produce to the crèche at reasonable cost (Swarts, 2010). Advantages to this option include the fact that Swart's prices are comparable to supermarket prices, and that the money spent on the food supports a local business enterprise (Swarts, 2010; Landman, 2010). Swarts is also willing to have the children visit his farm to learn about sustainable farming, connect with nature and spend time in a healthy, natural setting. One major disadvantage is that Swarts is unable to guarantee a consistent supply of food, as his produce is vulnerable to pests and adverse weather conditions (Swarts, 2010, Landman, 2010).

2) Vredenhof daily organic market

There is an organic market every weekday morning on the Vredenhof wine estate (approximately 7km from the Lynedoch EcoVillage). As with Swarts's farm, only seasonal produce is sold and the variety is limited. Prices compare to supermarket prices. The Lynedoch Crèche could possibly slot into the existing box scheme, whereby the crèche would receive a box of vegetables for each week (Landman, 2010).

4) Connecting the Lynedoch EcoVillage food system

Within the Lynedoch EcoVillage, there are 4 separate entities that regularly cater for a large number of people, namely the guest house, the aftercare/youth club, the crèche and Agreencafé (the deli of the Sustainability Institute). It may be helpful for these entities, along with members of the community, to develop an integrated food system for the Lynedoch EcoVillage that is consistent with the overarching vision of sustainable living and learning. Central coordination of this food system might relieve the crèche from doing its own shopping and would ensure that the food served to the young children is healthy, organic and ethically sourced.

Thirdly, the learning and benefits of food gardens could be extended to include older children, parents and community members as well. In a context of poverty and widespread unemployment, the skill of cultivating crops may be a way of putting healthy food on the table and generating income by selling surplus vegetables. The challenge for the Lynedoch Crèche as hub for sustainable community

development is to find creative ways of engaging the broader community. The scope of this case study does not allow for an in-depth investigation into the possible ways of facilitating sustainable community development through food security initiatives.

4.4.5 Learning points

The following learning points are structured according to the three research questions of this study, and draw together learning from the literature review and the practical research relating to the subject of this section.

1. How could an ECD hub's food system contribute to sustainable community development?

The food system of an ECD hub can contribute to or detract from sustainable community development. Consider, for example:

- *The flow of money*: buying locally supports the local economy; buying from supermarkets causes money to leave the local economy.
- *Ecology*: buying organic produce supports farmers that work with, rather than against, nature; buying non-organic produce supports mostly industrial chemical farming.
- *Nutrition*: providing healthy, nutritious meals to children supports sustainable community development by supporting children's physical and cognitive development, fostering healthy eating habits and disseminating information about the importance of nutritious food; endorsing bad eating habits promotes unhealthy communities and sub-optimal child development.
- *Food gardening*: producing food at the ECD hub promotes hands-on ecological learning for children and the community, saves money, promotes community resilience and re-establishes connections between humans and nature; buying food from unknown sources increases the disconnect between humans and nature, decreases community resilience and costs more money.

2. What might an ECD hub with a sustainable food system entail?

An integrated, ecological ECD hub with a sustainable food system demonstrates the skill and benefits of producing food in food gardens. It continuously explores alternative means of acquiring food (rather than supermarkets), such as local farmers' markets, community gardens, box schemes or community food networks. Finally, it serves as an advocate for, and educates about, healthy, organic and nutritious food.

3. What are the benefits of a sustainable food system in an ECD hub?

- *Financial*: it saves money and boosts the local economy by supporting local emerging farmers and local enterprises.
- *Ecological*: it benefits the natural environment and reinforces connections between humans and nature.

- *Community*: it promotes community resilience through learning how to cultivate food, and promotes healthy eating preferences in children and adults, which enhances children's development and community health.
- *Education*: it facilitates hands-on ecological learning for children and adults.

4. What are the limitations of this approach?

Implementing the suggestions outlined above will require certain levels of organisation and capacity within a crèche, such as driver's licences, computer literacy, knowledge about food gardening and time out to pursue the various options. It may be difficult to find local alternatives that can compete with supermarkets, which are known for convenience, variety and low prices.

4.5 ECOLOGICAL LEARNING

4.5.1 Introduction

Around the world, schools and preschools are beginning to adopt ecological approaches to education in recognition of the global polycrisis and disconnection between humans and the environment. Various names are given to these approaches, including 'learning for sustainability' and 'environmental learning' (Le Grange, 2007). The need for ecologically appropriate education is so urgent that the United Nations declared 2005 – 2014 the "Decade of Education for Sustainable Development"³⁰. In the literature review, the term 'ecological learning' was used as an umbrella term to denote educational approaches that make explicit the deep connections between children and nature and that seek to develop capabilities for sustainable development³¹. It was said that ecological ECD is profoundly important, as the early years are formative for children's values and attitudes (Davis, 1998; Barnett & Ackerman, 2006; McCain, Mustard & Shanker, 2007). Although there are no easy answers with regard to what ecological learning might practically entail, I suggested that beauty, ecological design, food, immersion in nature and the place-based study of resource flows are important elements of integrated ecological learning³². Sections 4.3 and 4.4 highlighted the ways in which ecological design, beauty, immersion in nature and food enhances ecological learning in the Lynedoch crèche. This section describes how ecological learning is integrated into the pedagogy and curriculum of the Lynedoch Crèche, and how the crèche's embeddedness in the Lynedoch EcoVillage is instrumental to the place-based study of resource flows which connects humans to the natural environment.

4.5.2 Pedagogy and Curriculum

The pedagogy and curriculum of the Lynedoch Crèche are based upon the Montessori approach. In addition to the Montessori approach, space is created to engage other appropriate means which might not be specific to the Montessori approach or material. The ecologically grounded Montessori

³⁰ See section 3.4.3 on page 49 and <http://www.unesco.org/en/esd/> for more information.

³¹ See section 3.4.3 on page 49.

³² See section 3.4.3 on page 49.

approach³³ (designed more than 100 years ago) combined with emerging global trends in ‘learning for sustainability’, ensures that the approach to ecological learning is both unique and contextually appropriate (Annecke, 2010; Mannel, 2010; Van Niekerk, 2010; Mabeba, N, 2010). Figure 4.2 depicts the approach to ECD employed by the Lynedoch Crèche. The child is placed at the centre, in a context made up of other children, adults, and the environment (this includes the prepared classroom environment as well as the natural environment). This context is grounded in three principles, namely ‘respect’, ‘reflect’, and ‘responsibility’ (Van Niekerk, 2010).

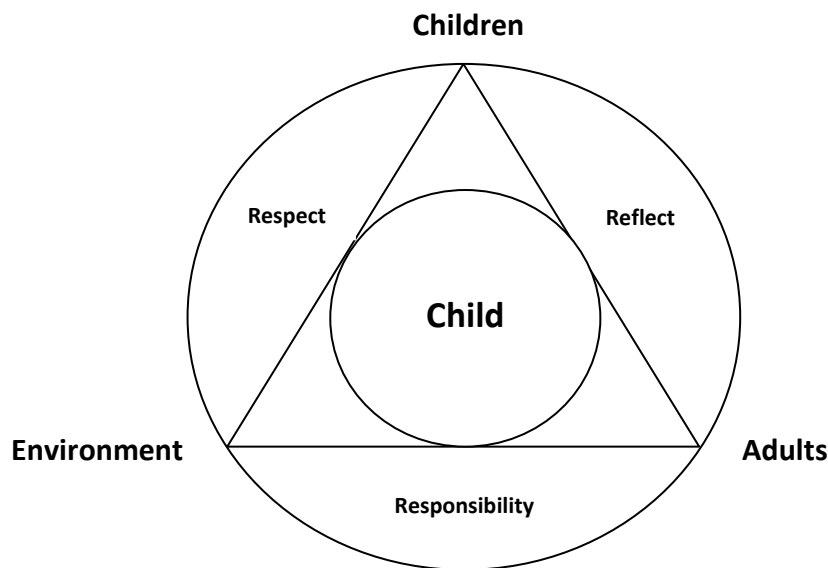


Figure 4.2: The approach to ECD at the Lynedoch Crèche
(Source: Van Niekerk, 2010).

With the aid of Montessori learning materials, learning takes place in a practical, hands-on manner. This is especially useful for children with FAS, who have great difficulty in understanding abstract concepts.

4.5.3 Place-based study of resource flows

Integral to ecological learning and a worldview that celebrates interdependence and complexity is the prerogative to make explicit every possible connection between humans and nature (Orr, 1992; Herbert, 2008). One way of doing this is to study resource flows, such water, sanitation, waste, energy and food, in one’s place³⁴. This generates a deep respect for the gifts of nature in daily life and is also a practical way to understand systems, and one’s role within those systems (Orr, 1992; Sutton, 2009).

The Lynedoch EcoVillage endeavours to demonstrate contextually appropriate and sustainable ways of managing resource flows. These systems are integral to ecological learning at the Lynedoch Crèche. Children engage with these systems on a daily basis and develop a grounded understanding of the flows

³³ Section 3.4.3.8 on page 60 explains the value of the Montessori approach for ecological learning.

³⁴ See section 3.4.3.7 on page 59.

in this community. The systems relating to water, energy, waste and food in the Lynedoch EcoVillage will now be briefly discussed, together with the ways in which these systems benefit ecological learning in the Lynedoch Crèche.

Water

South Africa is a water scarce country, projected to face severe water shortages in the next 5 to 10 years (DWAf, 2005). In this context, it made sense for the Lynedoch EcoVillage to include the following measures concerning water:

- Grey and black water is recycled by means of a biolytix system and vertically integrated wetland. The recycled water is re-used for flushing toilets and irrigation. This prevents clean water from being flushed down the drain and off-site, and ensures that the nutrients which remain in the recycled water are not lost, but re-invested in the soil to promote greenery and food gardens.
- Rainwater is harvested using an intricate system of channels leading down the slope of the property into a small dam.

At the Lynedoch Crèche, children have the opportunity to see where their water comes from, and where it goes after it gurgles down the drain. They learn that this water is then used to nurture the crops that they eat for lunch, or is used to flush their toilets. Throughout the process, children also learn about the various properties of water, and gain an appreciation of the value of water. This translates into habits that promote sustainability, such as using water sparingly (Mannel, 2010; Van Niekerk, 2010; Mabeba, N, 2010).

Energy

Not only is electricity generation harmful to the natural environment³⁵, but it also costs a lot of money. In February 2010, the National Energy Regulator of South Africa (NERSA) approved electricity price increases of 24.8 per cent from April 2010, with subsequent increases of 25.8 per cent for 2011/12 and 25.9 per cent for 2012/13 (NERSA, 2010). Generating electricity from renewable energy sources such as wind and solar power is environmentally and financially sustainable in the long run. Renewable energy solutions at the Lynedoch EcoVillage include:

- Solar water geysers fitted on the roof of every house and building.
- Solar roof tiles fitted on the roof of the Lynedoch Guest House and the Lynedoch Crèche.
- A street lamp powered with solar panel.
- A wind turbine.
- A biogas digester produces methane gas from black effluent from household toilets. The methane gas is used for cooking. This connects the cycle between food and human waste.
- Ecologically designed buildings decrease electricity consumption with natural heating, cooling, insulation and ventilation.

³⁵ Electricity consumption and generation contributes to environmental degradation and global warming through the extraction and burning of non-renewable fossil fuels, the release of atmospheric greenhouse gasses, atmospheric and aquatic chemical releases and toxic waste (Devezeaux, 2000).

- The railway line at the bottom of the Lynedoch EcoVillage property connects community members with Stellenbosch and Cape Town. This reduces fuel consumption from private vehicles.

Children at the Lynedoch EcoVillage witness the transformation of energy from the sun and wind into hot water and electricity. They engage with the renewable energy systems on a daily basis and are familiar with the process that occurs when a light is switched on or a warm water tap is opened. Consuming energy from renewable energy sources becomes a way of life and might translate into a life-long inclination to opt for renewable alternatives (Annecke, 2010; Mabeba, N, 2010; Mannel, 2010).

Waste

The Stellenbosch landfill site is already filled to capacity (Stellenbosch Municipality, 2007). If consumption and waste habits in this area are not radically changed, millions of Rands would be needed to upgrade the landfill site and to transport waste to another location, where it becomes another community's problem (Sustainability Institute, 2009). The "3 R's" (Reduce, Re-use and Recycle) is a useful waste strategy for individuals and communities. At the Lynedoch EcoVillage, waste solutions include:

- Waste separation at source into different bins allocated for organic waste, recyclable waste and waste destined for the landfill.
- Recyclable waste is taken to Horizon House, a home for mentally disabled adults, where the waste is further sorted and sold.
- A community composting project.
- A "Swop Shop": children are invited to collect large bags of recyclable waste. Every bag receives a certain number of 'tokens' according to its volume. These tokens can be exchanged for selected items such as school uniforms, stationary, soccer balls or sanitary products. This keeps the Lynedoch EcoVillage litter-free and helps poor children to acquire necessities that their family might not be able to afford (Schulschenk, 2010).

By partaking in the reduction, re-use and recycling of waste, children learn from a young age that "there is no such thing as away". They also learn how to close waste and resource cycles. For example, compost from organic waste nurtures the food that they eat. Alternatively, 'waste' such as old magazines, bottles or newspapers are reused for artworks or as learning materials (Van Niekerk, 2010; Mannel, 2010; Mabeba, N, 2010).

Food

Section 4.4 of the case study provides a detailed description of the food system of the Lynedoch Crèche. The potentialities of the food system for ecological learning are also embedded within the wider EcoVillage. In summary, these include:

- Organic and permaculture community food gardens.
- An organic seedling nursery.

- A community composting project.
- The Farm-to-Fork programme whereby vegetables for catering in the Guest House and Agreencafé are sourced directly from Swarts's farm.
- Organic and local food and beverages at Agreencafé.

Ecological learning based on food entails practical knowledge about food cultivation, an understanding of nutrient cycles, the food economy, the sourcing, packaging, transportation and discarding of food.

4.5.4 Analysis

The Lynedoch Crèche is optimally positioned to pursue ecological learning through the Montessori-based pedagogy and through practical learning made possible by an embeddedness in the Lynedoch EcoVillage. The core challenge is to pursue these opportunities deeply and consistently.

The ideal is for ecological learning to be deepened in children's subsequent years of education. The Gr. R teacher of the Lynedoch Primary School, Ms van Staden, was trained by the Sustainability Institute's ecologically orientated accredited ECD training programme³⁶ and is thus inclined to pursue possibilities for ecological learning. The fact that the building is shared by the crèche and the Gr. R class creates learning synergies and facilitates communication between the Lynedoch Crèche and the Lynedoch Primary School. Until recently, the Lynedoch Primary School did not pursue any form of ecological learning. However, it must be mentioned that at the time of writing, 5 teachers from the Lynedoch Primary School attended the first in a series of workshops called "Sustainable Quality Schools", (from 30 September to 4 October 2010 at the Sustainability Institute) that are intended to trigger the process of re-orienting the Lynedoch Primary School to both excellence within the classroom, and sustainability as part of the curriculum.

4.5.5 Learning points

The following learning points are structured according to the three research questions of this study, and draw together learning from the literature review and the practical research relating to the subject of this section.

1. How can ecological learning in an integrated, ecological ECD hub contribute to sustainable community development?

Through practical learning, children acquire a worldview that appreciates full cycles, complexity and interdependence. This enhances their capabilities for sustainable development as agents of change and future community leaders.

2. How might ecological learning in an integrated, ecological ECD hub be achieved?

The Montessori Method is a possible ECD pedagogy conducive to ecological learning. Valuable opportunities for ecological learning also stem from the place-based study of resource flows in and out

³⁶ See section 4.6.6 on page 101.

of the ECD hub. Ecologically sustainable resource systems (such as renewable energy or grey-water recycling) can enhance children's and communities' capabilities for sustainable development by demonstrating alternative and sustainable ways of interacting with resource flows.

It is important to note that ecological learning is not limited to Montessori-based learning approaches or ECD hubs embedded in eco-villages where alternative resource systems are demonstrated (such as the Lynedoch EcoVillage). Each context has unique possibilities for ecological learning. The challenge for teachers is to know their local socio-ecological environment well enough to adapt ecological learning to suit the context.

3. What are the benefits to the above-mentioned options?

- The Montessori Method is, by design, grounded in ecology and learning from nature. It can be adapted to suit contextual needs by combining principles designed a century ago with contemporary trends in environmental education or education for sustainability.
- Habits of mindfulness regarding water, energy, waste and food, which stem from an understanding of resource flows, are likely to go home with the children, and to remain with them for the duration of their lives.

4. What are the limitations?

Teacher capacity for integrated teaching is needed to ensure that ecological learning consistently informs every aspect of education.

4.6 COMMUNITY DEVELOPMENT ('HUBBING')

4.6.1 Introduction

The dictionary defines 'community' as "a group of people living in the same place or having a particular characteristic in common" (Oxford Dictionary, 2010). The Lynedoch Crèche is situated within the Lynedoch EcoVillage, yet few children permanently reside in EcoVillage. The majority of the children live in geographically dispersed locations, including farms in the Lynedoch Valley, Eersterivier and Khayamandi (Mannel, 2010). It is therefore difficult to assign to the word 'community' in 'community development' a single 'place'. For the purposes of this case study, these places are united by the fact that children from these communities attend the Lynedoch Crèche. In terms of being a hub for sustainable community development, the Lynedoch Crèche, therefore, has a very wide reach.

This section describes the Lynedoch Crèche as an integrated, ecological hub for sustainable community development, and points out possibilities for future expansion. The focus is on children-centred community development, racial and social integration, healing and bodywork, parental engagement, and the accredited ECD training program as pathways to sustainable community development.

4.6.2 Children-Centred Community Development

The first of the three goals of the Lynedoch Development Company is to create a socially mixed community that is organized around a child-centred learning precinct. This concept refers to the central importance of children in development, design and community building (Annecke, 2010, Van Niekerk, 2010; Mabeba, N, 2010; Mannel, 2010). The purpose of children-centred development is to create communities where children are nurtured and supported from a very young age until adulthood and independence (Mabeba, N, 2010; Van Niekerk, 2010; Annecke, 2010).

The Lynedoch EcoVillage strives to support children of all ages in several ways. For the youngest community members, a baby-care centre was opened in October 2010 to accommodate mothers with no alternative but to take their babies to the fields, where they are exposed to the harsh sun and to toxic agricultural chemicals. Alternatively, babies are sometimes left in the care of older siblings – some as young as 5 years old (Annecke, 2010; Van Niekerk, 2010). From age 2 and a half till 5, children attend the Lynedoch crèche, and from 5 years onward, the children are enrolled in the Lynedoch Primary School. In the afternoon, children may voluntarily join the aftercare facility in the crèche building. The aftercare is roughly divided into three groups of children – aged 2 and a half till 5 years, 6 to 10 years and 11 years and above, the last of which is the youth club. The aftercare provides homework support as well as various activities, including gardening, soccer, games, and arts and crafts. There are currently approximately 80 children who voluntarily attend the aftercare and youth club (Brooks, 2010; Mabeba, N, 2010; Van Niekerk, 2010; Gelant, 2010; Mannel, 2010).

The baby centre, crèche, primary school, aftercare and youth club support children up to the time when they finish school. The subsequent goal is to find ways of supporting children that drop out of school or have passed grade 12 but have nothing to do. Many children do not have the means or ability to pursue further academic study (Van Niekerk, 2010; Brooks, 2010). Non-academic capabilities are needed to enable youth to escape cycles of poverty and alcohol abuse. According to community member and ECD trainer Naledi Mabeba:

I don't want to walk past idle youth knowing that we have done nothing for them. Even if we as community or institution can't provide the help they need, we should at least be there to counsel them and refer them to a place where they could be helped. Children and youth should turn to us at any time and at any age, knowing that we would be there to support them. If this is not so, then I am afraid that we as community have failed in our most important task (Mabeba, N, 2010).

An emerging response to this need is the “Skills for Youth” project, which is a further development of the section 21 (non-profit) company, pioneered by the Sustainability Institute, called “Learning for Sustainability” (LFS). LFS is now a Further Education and Training (FET) college, registered by the Department of Education, for level 4 ECD training. The intention of the Skills for Youth project is to expand LFS to include accredited training in Sustainability Skills. This is an opportunity for the youth to obtain a qualification and to acquire skills needed to be employed in the movement towards sustainable development (Annecke, 2010; Mabeba, N, 2010; Van Niekerk, 2010).

A community that puts children first conveys the security of being held, supported and guided in the process of growing up. Children also gain an understanding of their place in the age continuum within the community (Human, 2010). Children, in turn, contribute a lively, generative energy to the Lynedoch EcoVillage. Mornings are characterised by children's noise from the school and crèche, afternoons buzz with aftercare activities and soccer practices of the Lynedoch United Soccer Club (winners of the Stellenbosch junior league in Under 11, Under 15 and Under 17 – out of 40 participating teams), and evenings have a quiet and calm atmosphere. This creates a more reflective space before the cycle is repeated the following day (Swilling, 2010). The school was purposefully situated at the centre of the EcoVillage as a visual reminder of the importance of children and to explore ways in which a beautifully designed, centrally located school building might contribute to the process of establishing a community (Swilling and Annecke, 2004, 2006; Swilling, 2010; Annecke, 2010). Much has been learned from the city of Bogota, Colombia, under the leadership of then Mayor Enrique Penalosa, who focused on “happy children – happy cities” (Annecke, 2010). According to Penalosa:

In Bogotá, our goal was to make a city for all the children. The measure of a good city is one where a child on a tricycle or bicycle can safely go anywhere. If a city is good for children, it will be good for everybody else. Over the last 80 years we have been making cities much more for cars' mobility than for children's happiness (Penalosa quoted in Walljasper, 2010). .

4.6.3 Racial and social integration

Prevailing racism and socio-economic inequalities in the Lynedoch Valley seem to mirror many of the realities of South Africa as a whole. Racist attitudes are perpetuated as children learn stereotypes and prejudice from their parents (Mannel, 2010; Van Niekerk, 2010; Mabeba, N, 2010). The establishment of a multi-cultural, multi-racial nation in South Africa will depend largely on the ability of current and future generations to understand and connect to people from different walks of life. Early childhood is a sensible time to start building a nation based on values of inclusiveness, tolerance and understanding (Pearson & Degotardi, 2009).

The Lynedoch Crèche has a mixture of children in terms of race and mother tongue. Of the thirty seven children enrolled for the year 2010, twenty are from farm-worker families on surrounding farms, 3 are from Eersterivier and 14 are from Khayamandi, which is near Stellenbosch. The teachers, as well as the children from the farms and Eersterivier, are coloured and speak Afrikaans, while the Khayamandi children are black and speak isiXhosa. One white boy who lives in the EcoVillage attends the crèche on a part time basis (Mannel, 2010). According to principle Suelle Mannel (2010), isiXhosa parents send their children to the Lynedoch Crèche because they want their children to learn Afrikaans, and because the quality of the Lynedoch crèche is perceived to be higher than those in Khayamandi.

Bringing about social cohesion in the classroom is a priority. In some ways this occurs naturally, prompted by children's curiosity and eagerness to learn another language. In other ways it has to be orchestrated, for example by ensuring that working groups consist of children from mixed racial groups (Mannel, 2010). Communication is difficult at times, but because the Montessori Method relies heavily

on demonstration rather than instruction, speaking is minimized. Naledi Mabeba, who volunteers in the crèche on weekday mornings, speaks isiXhosa fluently. This has been a great help (Mannel, 2010; Annecke, 2010).

Unfortunately, children are deeply impacted by experiences of adult racism; this is evident in their interaction. Coloured children, for example, tend to look down on the black children, sometimes referring to them as ‘bantus’³⁷. Black children, in turn, tend to form a tight group that intimidates the coloured children (Mannel, 2010; Mabeba, N, 2010). On a practical level, group formation based on ethnicity and language is aggravated by the fact that the Khayamandi children arrive an hour later than the Afrikaans children. This deepens the divide as the two groups eat breakfast and conduct their morning circles separately. Most of the Xhosa-speaking children stay at the crèche until 17:00, while the majority of the Afrikaans speaking children go home around mid-day (Gelant, 2010; Mabeba, N, 2010; Mannel, 2010).

The importance of ECD for the formation of values and attitudes cannot be overemphasized. By encouraging racial and social integration, the Lynedoch Crèche significantly contributes to sustainable community development. It is vital to ensure that the classroom is a non-racial and multilingual space from the outset. This enables children to free themselves from the deeply entrenched racism and prejudice in their communities. Practical ways to achieve this may include eating breakfast together and conducting multilingual morning circles.

4.6.4 Healing and bodywork

Many children bear deep scars due to high levels of substance abuse and violence in their families and communities (Van Niekerk, 2010; Mannel, 2010; Mabeba, N, 2010; Annecke, 2010). Trapped in this reality and with no access to Western-style psychotherapy, healing and bodywork might present helpful ways to work through these experiences. Bodywork is defined as:

A general term for therapeutic methods that centre on the body for the promotion of physical health and emotional and spiritual well-being, including massage, various systems of touch and manipulation, relaxation techniques, and practices designed to affect the body's energy flow (Dorland's Medical Dictionary for Health Consumers, 2007).

At the Lynedoch crèche, healing and bodywork such as tai chi, massaging, breathing exercises and silence are integrated into the daily routine (Mannel, 2010; Van Niekerk, 2010). This calms the energy in the classroom and prepares children to concentrate on the individual work that they will be engrossed in over the course of the next three hours (Mannel, 2010; Mabeba, N, 2010; Van Niekerk, 2010). Teachers also benefit from healing as they find ways of managing personal emotions so that pain, bitterness or irritation is not unwittingly imposed upon the children. Montessori classrooms, in

³⁷ The dictionary meaning of the word ‘bantu’ refers to a linguistically related group of people in Southern Africa. In South Africa, however, the term has a derogatory meaning which stems from the Apartheid era (Collins English Dictionary, 2009).

particular, emphasize the importance of transferring calm from teacher to child (Mabeba, N, 2010; Van Niekerk, 2010; Mannel, 2010).

Healing is also a major component of the accredited ECD Childhoods Learning programme of the Sustainability Institute³⁸. Many women in training have experienced violence but have no way of transforming or healing this. The healing experienced and practiced by these women is also taken to their respective learning environments (Annecke, 2010; Van Niekerk, 2010; Mabeba, N, 2010).

4.6.5 Parents

The involvement of parents can be a key pillar of integrated sustainable community development through ECD. At the Lynedoch Crèche, parents play a minimal role in the day-to-day operation of the crèche (Mannel, 2010; Van Niekerk, 2010; Mabeba, N, 2010). This may be because parents live relatively far away and on the whole do not own private vehicles, or because parents have no need to drop off or collect their children from the crèche, as most children arrive by bus. Many parents work long hours and have little extra time to engage in the activities of the crèche (Mannel, 2010).

Alternative ways of connecting with parents had to be found. Ross van Niekerk, former principle of the Lynedoch Crèche, grew up on a farm in the Lynedoch Valley. Based on her understanding of the context and dominant challenges, she decided to focus on healing as entry point for parental engagement. Over the past three years, a number of healing workshops have been held with mothers from surrounding communities.

The women are invited to spend the weekend as guests in the Lynedoch Guest House where they learn basic healing and bodywork techniques to help them to work through and transform pain. These weekends also have an educational focus which may include topics like FAS, domestic violence and alcohol/substance abuse. Relief from domestic responsibilities and time spent in a beautiful, natural setting is in itself an important part of the healing process (Van Niekerk, 2010; Mabeba, N, 2010). Capabilities for sustainable development are enhanced through exposure to the systems and philosophy of the Lynedoch EcoVillage. Although a weekend may not be enough time to gain an in-depth understanding of sustainable development, those who are interested are then aware of the information and practical knowledge available to them at the Lynedoch EcoVillage (Van Niekerk, 2010; Mabeba, N, 2010).

Similar workshops have been facilitated for the local police's trauma unit and members of a local church. Although there is a high demand for these workshops, only four workshops are currently held per year due to time and financial constraints (Van Niekerk, 2010).

4.6.6 Accredited ECD training: the Childhoods Learning Programme

The Lynedoch crèche serves as observation centre for an accredited ECD training programme developed by the Sustainability Institute, called the Childhoods Learning Programme. This is a Montessori-based

³⁸ See section 4.6.6 on page 101.

curriculum with a strong emphasis on integrated ecological learning. The curriculum adheres to the requirements of the Education, Training and Development Practice Sector Education Training Authority (ETDP SETA). The ETDP SETA has accredited this curriculum for National Qualifications Framework (NQF) levels 4, 5 and the National Diploma in ECD³⁹. The Sustainability Institute also set up a non-profit section 21 company called Learning for Sustainability, which is now registered as a Further Education and Training (FET) institution for ECD⁴⁰ (Annecke, 2010; Mabeba, N, 2010).

Although the training programme is based upon Montessori principles, it is not accredited as such. Because Montessori accreditation is issued only by overseas institutions, it was deemed more important to ensure contextual relevance and recognition by the ETDP SETA, as this gives trainees the equivalent of a Gr. 12 qualification. This greatly enhances their ability to pursue further education or to find adequate employment (Mabeba, N, 2010; Van Niekerk, 2010). Basic education such as this increases levels of self-confidence and dignity. An unintended consequence of this sense of empowerment is a high drop-out rate from the program. Because of the limited financial possibilities as an ECD practitioner, many women opt out as soon as they have acquired the basic skills needed to pursue more profitable alternatives (Annecke, 2010; Mabeba, N, 2010; Carelse, 2010).

Focus areas in the ECD training curriculum include sustainability and ecological learning, classroom management and financial skills, healing, child development, and an overview of the various developmental and educational theories⁴¹. The ECD training contributes to the government's goal of positioning ECD as an employment-creating sector (as set out in the Apex priorities)⁴², as well as the enhancement capabilities for sustainable development (Mabeba, N, 2010). ECD training has a broad reach and has significant transformative potential. In addition to the empowerment of the trainees (mostly women), each new teacher touches the lives of children, their families and communities as integrated ECD community hubs are replicated across the country (Annecke, 2010; Mabeba, N, 2010).

The training is based at the Lynedoch EcoVillage. The trainees travel to Lynedoch for each module and are accommodated in the Guest House. As with the parental healing workshops, the Guest House accommodation is an important part of the ECD training (Van Niekerk, 2010; Mabeba, N, 2010). Firstly, it facilitates access to the Lynedoch Crèche as observation centre. Secondly, it supports the sustainability content of the training as students engage in sustainable living and learning at the Lynedoch EcoVillage. All students enrolled in courses at the Sustainability Institute partake in 'morning work', whereby 45 minutes each morning are spent doing community work such as gardening, cooking, farming or cleaning. This enhances students' role from passive recipients of information to participants in the functioning of an EcoVillage (Annecke, 2010; Van Niekerk, 2010). Finally, staying in the Guest House reinforces the healing content of the ECD training by giving women time to relax, exercise and spend time in a beautiful setting (Van Niekerk, 2010; Carelse, 2010).

³⁹ Please refer to Appendix C on page 124 for the learning outcomes and scope of the Childhoods Accredited Learning programme.

⁴⁰ See section 4.6.2. on page 97.

⁴¹ For detailed description of the accredited ECD training curriculum, please refer to Appendix D on page 126.

⁴² See section 3.5 on page 69.

The Childhoods Training Programme is a way of multiplying the ECD learning at Lynedoch. One of the most inspiring stories comes from the rural setting of Oude Muragie near Oudshoorn, South Africa (see box 4.4 below).

Box 4.4: The Oude Muragie Jubilee Preschool

Oude Muragie is a small rural district near Oudtshoorn, South Africa. For 15 years Christina Carelse tried to open a preschool in this area. Her own children had no access to ECD. After many years, she secured a scholarship for herself and four other women to attend the Oude Muragie Jubilee Training Centre under the auspices of Antoinette Strapp (Carelse, 2010; Stassen, 2010). After graduating from this training, the women enrolled in the Sustainability Institute's accredited ECD training programme to deepen their knowledge (Stassen, 2010).

Although these remarkable women (Christina Carelse Annemarie Stuurman, Wena Stassen, Doriena Maritz and Sofia van Wyk) are still busy with their NQF level 4 certificates at Lynedoch, they have wasted no time in opening the Oude Muragie Jubilee Preschool – the first in the area. This was made possible by the vision and passion of the teachers, as well as the cooperation of the entire community (Carelse, 2010). Local farmer Le Roux van der Westhuizen generously donated a building on his property, and various donations and help from volunteers ensured that the crèche was ready to be opened on the 14th of April 2010. Farm-worker parents willingly sacrificed an entire day's wage in order to attend the opening ceremony, which was attended by the new teachers: the local police, the Department of Social Development, staff from the crèche in De Rust, farmers of the area, Naledi Mabeba, N and Ross van Niekerk, and various community members (Carelse, 2010; Stassen, 2010; Van Wyk, 2010).

The teachers were strongly influenced by the sustainability content and practice at the Lynedoch EcoVillage. Accordingly, they aspire to establish this crèche as a hub for sustainable community development that might include an aftercare and youth programme, parental workshops, computer literacy classes, animal welfare training and extra-mural activities such as dancing, drama and sport in the near future (Stassen, 2010; Maritz, 2010; Stuurman, 2010). Community learning is already taking place. Carelse started teaching the families in the district how to grow vegetables organically, the way she had seen it done at Lynedoch. Children soon assumed responsibility for their family gardens and take great pleasure in showing her the vegetables that they have grown themselves (Carelse, 2010).

Becoming an integrated, ecological hub for sustainable community development may not always be easy. The Oude Muragie district faces similar issues as Lynedoch, including abject poverty, substance abuse, high FAS prevalence, violence and neglect (Carelse, 2010). Another urgent challenge relates to funding. Although the crèche has been operational for more than 6 months, there still is no secure source of funding. No salaries have been paid and school meals depend on donations (Carelse, 2010; Stassen, 2010). Teacher commitment such as this in adverse conditions is not common. Not only are they persevering, but according to assessor Prudence Ramsey, they are performing excellently (Ramsey, 2010).

Carelse, Stassen, Stuurman and Van Wyk are development workers in their own right, and are contributing to the enhancement of capabilities for sustainable development in the Oude Muragie district. The children from a poor farm-worker community in rural South Africa now have the opportunity to develop, grow and learn in a beautiful and ecologically orientated preschool. From a young age they learn skills, values and attitudes that will help them to grow into well-rounded, confident and resilient human beings. Parents and community members have the opportunity to engage in the development of the children, and to become part of the movement toward sustainable development.

4.6.7 Learning points

The following learning points are structured according to the three research questions of this study, and draw together learning from the literature review and the practical research relating to the subject of this section.

1. How can integrated, ecological ECD hubs contribute to sustainable community development?

- Integrated, ecological ECD hubs may promote children-centred community development that places children at the centre of planning, policy and action.
- Mixed racial and linguistic environments in ECD hubs may teach children and communities values of understanding, tolerance and inclusivity that are essential for nation-building in South Africa.
- Healing and bodywork techniques used in the ECD hub can promote healing and well-being in the entire community.
- ECD hubs may take advantage of parental involvement to promote sustainable community development through intergenerational learning, parental education, service integration and ecological learning.
- Accredited ECD training may have the ripple effect of empowering trainees to establish ECD hubs that promote sustainable community development in their respective communities.

2. What might an integrated, ecological ECD hub entail?

Fundamentally, integrated, ecological hubs advocate for and encourage children-centred community development. The approach of each ECD hub will differ. At the Lynedoch Crèche, sustainable community development is promoted through healing and bodywork, an emphasis on racial and social integration, and attempts to strengthen the social fabric by enhancing parents' capabilities for sustainable development. It was shown that accredited ECD training may have a wide-reaching impact. Subsequently, ECD hubs might seek to promote accredited ECD training where possible – either by enrolling teachers, encouraging community members to obtain a qualification or by establishing an accredited ECD training programme at the ECD hub. It is important that all efforts toward sustainable community development using ECD as entry point should explore ways of strengthening community capabilities for sustainable development in contextually-appropriate ways.

3. What are the benefits of 'hubbing'?

The principle benefit of 'hubbing' is that the social fabric of communities is strengthened in concurrence with children's education and development. In this way, ECD contributes to sustainable development on community, national and global levels.

4. What are the limitations of 'hubbing'?

'Hubbing' requires teachers that have the capacity to assume multiple roles: ECD practitioner, community development practitioner, leader and advocate. The ECD hub also needs the capacity to configure organisational structures in a way that supports and enables teachers to fulfil multiple roles. Another limitation is that not all ECD hubs enjoy active parental and community involvement. In these

cases, creative ways of ‘hubbing’ must be developed which can be successful without explicit community support.

4.7 FINANCES AND INSTITUTIONAL ARRANGEMENTS

4.7.1 Introduction

A well-functioning ECD hub requires sound financial management and appropriate institutional and governance structures. A lack of attention to these details can be detrimental to the success of the ECD institution. This section outlines the institutional arrangements and the finances of the Lynedoch Crèche.

4.7.2 Institutional Arrangements

The crèche and the accredited Childhoods Learning programme is a project of the Sustainability Institute, and the Sustainability Institute owns the building in which the crèche is located. This relationship provides invaluable support to the crèche and training programme in terms of expertise, governance, financial assistance, bookkeeping and general support (Mannel, 2010; Annecke, 2010). One of the main ways in which the crèche is currently supported, is through ECD trainer Naledi Mabeba (employed by the Sustainability Institute), who has volunteered to help Mannel to establish and normalise the crèche. Mabeba has, for the past two months, spent three hours in the crèche each morning, along with after-hours support with planning and assessment.

4.7.3 Finances⁴³

The crèche generates an average monthly income of R11 418. Average total expenses per month equal R11 025. The income is made up of (in total averages per month):

- Tuition fees⁴⁴ (R2 231).
- ECD funding from the Sustainability Institute (R4 167).
- A network of benevolent donors (see below) (R4 917).

Funding for the Lynedoch Crèche, therefore, comes from three main sources: tuition fees, the Sustainability Institute’s ECD budget and external funding (Budget, 2010). The Sustainability Institute’s ECD budget is funded by British American Tobacco South Africa (BATSA) and Meerlust. BATSA funded the ECD training programme for four years. A portion of the money was allocated to the crèche, as the training required a high quality crèche as observation centre (Annecke, 2010). Meerlust, a wine farm in the Lynedoch Valley, recently joined hands with the Lynedoch EcoVillage in the development and well-

⁴³ All amounts are averages of data from January to August 2010 as presented in the 2010 financial statements (see Appendix D on page 126)

⁴⁴ Tuition fees are currently set at R50 per child per month for the crèche, with an additional R100 per month per child who attends the aftercare. This source of income usually fluctuates according to parents’ ability (and willingness) to pay. The amount reflected above is the average income received for tuition fees for the months of January to August.

being of children. Children from Meerlust now attend the Lynedoch aftercare and youth club, and, in return, the wine farm contributes R500 000 per annum for the next three years. The previously mentioned external funding is a network of well-wishers from abroad. This network was activated by a lady who visited the Lynedoch Crèche and was deeply moved by this experience. She subsequently assembled a group of people who each agreed to contribute 120 British Pounds per annum for a period of three years. This funding is enough to support 42 children by paying for their tuition fees, two meals a day, a little schoolbag, and a tracksuit. Each funder receives a certificate to verify and acknowledge their contribution⁴⁵ (Annecke, 2010; Mabeba, N, 2010; Van Niekerk, 2010; Budget, 2010; Brooks, 2010).

Another possible source of funding is the government subsidy of R12 per child per day for registered ECD sites. The Lynedoch Crèche is not currently registered, due to the inability of the company auditing the Sustainability Institute's financial statements to complete the audit at the specified date. Because audited financial records are required for registration, the Lynedoch Crèche now has to repeat the entire registration process with the hope of obtaining this funding. With 37 children in the crèche, and approximately 22 school days per month, the government subsidy would provide an additional income of approximately R9 768 per month.

Table 4.2 (below) presents 3 funding scenarios in order to gain a sense of the crèche's current financial situation, the projected financial situation if the subsidy is accessed and the projected financial situation with subsidy but without financial assistance from the Sustainability Institute. The three scenarios are:

- 1) Total average income per month (without subsidy).
- 2) Projected total average income per month (with subsidy).
- 3) Projected average income per month (with subsidy but without external assistance).

Table 4.2: Three funding scenarios (Rands).

	Total Average income per month (without subsidy)	Projected total average income per month (with subsidy)	Projected average income with subsidy but without external support
Tuition fees	2334	2334	2334
ECD budget	4167	4167	0
External funding	4917	4917	0
Subsidy	0	9768	9768
TOTAL INCOME	11418	21186	12102
TOTAL EXPENSES	11025	11025	11025
NET PROFIT/ (LOSS)	393	10161	1077

(Source: Lynedoch Crèche budget 2010)

⁴⁵ See appendix E on page 128.

The Lynedoch Crèche is currently meeting its financial requirement and is making a slight profit of R393. It is clear that the government subsidy will make a remarkable difference, and that a large residual (R10 161) will be carried over at the end of the month (provided that the expenses remain constant). The third scenario depicts the situation if the crèche received the government subsidy but had no financial support from the Sustainability Institute. In this scenario, R1 077 per month is carried over. This goes to show what a significant difference the government subsidy makes in terms of ECD institutions' financial security and independence. It may be worth noting that many ECD hubs in poverty-stricken areas cannot rely on a steady income from tuition fees and rely solely on the government subsidy. The Lynedoch crèche also receives additional income as a portion of the children attend the aftercare and pay R150 per month instead of R50.

4.7.4 Learning points

The following learning points are structured according to the three research questions of this study, and draw together learning from the literature review and the practical research relating to the subject of this section.

1. How can finances and institutional arrangements promote ECD as entry point for sustainable community development?

No ECD hub can successfully fulfil its roles without sound financial and institutional arrangements.

2. What does 'sound financial and institutional arrangements' entail for an integrated, ecological ECD hub?

Sound institutional arrangements encourage leadership and independent decision-making, ensure optimal productivity, and promote accountability and responsibility. It also allows the ECD hub to seek and engage in appropriate partnerships with CBOs, NGOs or other civil society organisations. Sound financial systems relate to the ability to manage finances and to keep adequate records, as well as the ability to secure additional funding if needed by applying for government subsidies, pursuing income-generating activities, or partnering with donors and civil society.

3. What are the benefits of the above-mentioned options?

Once the institutional and financial systems are in place, ECD hubs can focus their energy on their principal goal, namely promoting sustainable community development through the education and well-being of young children. Potential donors or sponsors tend to be more willing to partner with ECD hubs that have transparent and accountable financial systems and institutional arrangements.

4. What are the limitations?

It takes time to put these systems in place, and to train the person responsible for managing them. ECD hubs may consequently have to incur initial consultation or training costs. In some cases, teachers might not have the time or capacity to administer financial and institutional systems. This can either mean that the systems in place have no use, as no one maintains them, or an additional staff member must be appointed for administrative duties, requiring money for another salary.

4.8 WAY FORWARD

4.8.1 Introduction

As researcher, I hesitated to propose a way forward based on my research findings and perceptions. Despite extensive observations, descriptions and analysis, I remain an outsider. I remain convinced of the importance of regularly engaging in a process of reflection and strategic planning in order to determine the way forward, and thought it appropriate to contribute to the formulation of a way forward for the Lynedoch Crèche in two principal ways.

The first was to present my research findings and the learning points to the ECD team at the Lynedoch EcoVillage. I hope that this presentation will encourage the ECD team to look afresh at their progress and to recognise areas of untapped potential. Most importantly, I hope that this learning will be incorporated into future policy and action. Due to time constraints, this presentation will only occur after the submission of this study.

The second was to convene a series of meetings, organised according to the process of an Appreciative Inquiry⁴⁶, with the core actors of the ECD programme at Lynedoch⁴⁷. An appreciative Inquiry was selected as a strategic tool which would allow me to think about a possible way forward in collaboration with the entire ECD team. In this way, the role of “researcher-expert” was changed to “participant”, and a generative element was added to the case study research, which I hope will be useful to the Sustainability Institute and the ECD team.

4.8.2 Key outcomes of the Appreciative Inquiry

The four D process of the Appreciative Inquiry was followed, namely “Discover, Dream, Design and Destiny”⁴⁸. The key outcomes of this process for the way forward pertain to four core elements.

- 1) The first priority is to ensure that the Lynedoch Crèche is of a high standard and is exemplary in its attempts to demonstrate possibilities for sustainable community development as an integrated, ecological ECD hub. In order to achieve this, the ECD team must collaboratively

⁴⁶ See section 2.3.4.5 on page 30.

⁴⁷ The following people were able to attend the meetings:

- 1) Eve Annecke (director of the Sustainability Institute)
- 2) Naledi Mabeba, N (ECD trainer)
- 3) Ross van Niekerk (ECD assistant trainer; former principal of the crèche)
- 4) Alison Engelbrecht (ECD training and accreditation)

Current principal Suelle Mannel was not able to attend these meetings. She was, however, briefed about the outcomes, and was given the opportunity to comment and give input. She was involved in subsequent meetings that flowed from this process. Prudence Ramsey (ECD trainer and assessor) also apologised for not being able to attend.

⁴⁸ For a full description of the outcomes of the Appreciative Inquiry, please refer to Appendix F on page 129.

decide how best to support principle Suelle Mannel, and where each person's talents and skills would be most useful.

- 2) The institutional arrangements of the Lynedoch Crèche must be rearranged from that of a project of the Sustainability Institute to an independent entity with its own governing board. The main benefit of this arrangement is increased levels of accountability, ownership and parental involvement. The crèche has the option of entering into a 'voluntary partnership' with the Sustainability Institute.
- 3) There is a need for special training in aftercare and youth development to ensure that the aftercare programme is of a high quality. PASCAP⁴⁹ was identified as a possible accredited training provider, given that the training is adapted to include sustainability.
- 4) Within the ECD team, there is a need for each person to reflect upon her career trajectory and her role within the programme. This will enable the team to take stock of its collective capabilities, to find ways of fully utilising the capacity within the team and to increase capacity where it is needed.

4.9 CHAPTER SUMMARY

This chapter presented the findings of the practical research, presented in the format of a descriptive case study of the Lynedoch Crèche. The Lynedoch Crèche was selected as a working example of an integrated, ecological ECD hub. The core purpose of this case is to ground the theoretical framework developed in the literature review in the intricacies of praxis. While this case is not an example of a 'perfect' model for sustainable community development using ECD as entry point, the intention is for the reader to relate to, and learn from the common developmental challenges that the Lynedoch Crèche grapples with.

This chapter explored various elements of the Lynedoch Crèche. After describing the community context of the crèche, a physical description of the crèche building and gardens was set out with an explicit focus on the various opportunities for ecological learning that stem from this setup. The food system of the Lynedoch crèche was examined next, and areas where a more financially and ecologically sound approach might be followed were highlighted. Thereafter, the extent and content of ecological learning both in and out of the classroom was considered. I proceeded to look at the ways in which the Lynedoch Crèche contributes to sustainable community development by establishing itself as an integrated, community-based ECD hub. On a practical level, the financial and institutional arrangements were described. A summary of the principle outcomes of an Appreciative Inquiry was given as a tentative way forward for the crèche.

⁴⁹ PASCAP is a development organisation and an accredited training provider aimed at strengthening the capacities of high poverty profile communities to address socio-economic and spatial inequalities. They offer a range of training programmes, including accredited training for after-care programmes and youth development. For more information, visit: www.pascap.org.za.

Chapter 5: Emerging Themes

5.1 INTRODUCTION

This chapter draws together the theoretical and practical research with cross-cutting themes that emerged from the process of analysing and interpreting data. The techniques employed for the interpretation and analysis of data are Qualitative Data Analysis (QDA) and sense-making theory⁵⁰. The entire research process was grounded in complexity theory and systems thinking⁵¹, with the effect of emphasizing interdependence, integration and holism as opposed to reductionism and categorisation. The themes relate to the need for a paradigm shift, the importance of reconnecting with nature, ensuring relevance, capacity requirements, and governance and management capabilities.

5.2 SHIFTING PARADIGMS

Imagining and creating alternative futures necessitates the ability to question dominant paradigms and search for more appropriate modes of thinking and doing. In the light of the global polycrisis, largely brought about by a neo-liberal developmental paradigm underpinned by a reductionist and disjointed worldview (Capra, 1996; Morin, 1999; Bidwai, 2006), I suggest that a more appropriate worldview is one that is informed by a deep connection with nature and an appreciation of interdependence, complexity, uncertainty and whole systems (Orr, 1992; Miller, 2002; Herbert, 2008; Hagglund & Pramling-Samuelsson, 2009).

It seems that such a paradigm shift is needed in order to reconceptualise ECD from a detached educational entity to ECD as pathway to sustainable community development. This suggests that the core purpose of ECD is no longer only to prepare children for school, but to facilitate resilient communities by enhancing children's and communities' lifelong capabilities for sustainable development (Herbert, 2008; Davis et al., 2009; Sterling, 2009; Stone, 2009).

5.3 RECONNECTING

Disjointed and reductionist worldviews appear to be symptomatic of a deep-seated disconnection from nature (Macy & Young-Brown, 1998; Hebert, 2008; Sterling, 2009; Stone, 2009). Fundamental to a shift in paradigms, therefore, is to rekindle the connections between humans and nature. Children are already richly connected beings. A core purpose of integrated, ecological ECD is to make explicit these connections and establish a sense of the wonder and complexity of the universe (Miller, 2002; Louv, 2008). This can be achieved through the content of education, a teacher or parent that helps children to become attuned to the rich diversity of nature, or simply by allowing children to play freely and explore

⁵⁰ See section 2.4 on page 31 for a detailed description of QDA and sense-making theory, the methodology employed and the rationale for selecting these techniques.

⁵¹ See sections 1.4 (page 19) and 2.4 (page 32) for a brief description of complexity theory and systems thinking.

in natural settings (Carson, 1956; Herbert, 2008; Louv, 2008). Gardening (especially food gardening) is another explicit way of connecting with nature (Bell & Dymont, 2008; Stone, 2009). As the Lynedoch Crèche demonstrates, teachers' values and attitudes are important determinants of the extent to which children are allowed opportunities to develop profound relationships with nature. The greatest obstacle seems to be the fact that outdoors' education is deemed to be inferior to theoretical classroom education (Littledyke, 2007; Hacking, Barratt & Scott, 2010).

5.4 RELEVANCE

In the complex socio-ecological realm of sustainable community development, it is becoming increasingly clear that there are no 'tick-box' approaches that are successful in any context. The impact of integrated, ecological ECD hubs, therefore, depends on their ability to skilfully knit together an approach that is relevant to the needs, possibilities and limitations of the children and their communities. This is a considerable shift away from mainstream development and funding perspectives, which tend to rely on 'measurable outcomes' or 'performance indicators' intended to improve accountability, but which undermine efforts to approach development in a holistic and integrated way (Annecke, 2010; Ramsey, 2010; Mabeba, N, 2010).

Relevance can only be achieved through an intimate knowledge of the local socio-ecological environment as well as national and global trends that might impact on this environment (Orr, 1992; Noddings, 2005; Lamers, 2008). This knowledge is then used collectively to determine the context-specific capabilities that would enable sustainable community development, presently and in the future. These capabilities, in turn, inform the content of education, the pedagogy and the process of sustainable community development. This process is never complete, and is repeated on a regular basis (Mabeba, N, 2010).

5.5 CAPACITY

It seems that integrated, ecological ECD hubs require ECD practitioners that are competent both as teachers and as sustainable community development practitioners. Technical skills (such as teaching, planning, assessing, financial management, maintenance, and cooking) are needed, as well as the ability to interact with and provide leadership to a wide variety of stakeholders. The ECD practitioner further requires practical capabilities for sustainable development in order to equip the ECD hub as a demonstration site for alternative living and learning that promotes ecological education for all (Mannel, 2010; Van Niekerk, 2010; Mabeba, N, 2010).

The issue of capacity is a multi-layered and systemic problem. The first layer of the problem relates to the urgent shortage of highly qualified, competent ECD practitioners in South Africa. This problem may be attributed to a) limited career possibilities and income trajectories for ECD practitioners, b) insufficient opportunities for training and skills development, and c) the inability of existing accredited training to equip ECD practitioners to establish and operate integrated, ecological ECD hubs (Biersteker & Motala, 2008; Motala, 2009; Gustaffson, 2010). These difficulties are underpinned historically by a

lack of investment in ECD, due to ignorance about the fundamental importance of ECD. The prioritisation of ECD is a relatively new phenomenon (Irwin, Siddiqi & Hertzman, 2007).

Due to the systemic nature of the problem, the problem of capacity in the ECD sector in South Africa will not be solved by a series of disconnected solutions. Solutions that address the systemic deficiencies of the current system are required. Reconceptualising ECD as entry point for sustainable community development may be a way in which the role of ECD can be reconsidered and aligned with national goals of sustainable community development, thus enjoying greater attention and resources (Mabeba, N, 2010; Van Niekerk, 2010).

5.6 GOVERNANCE AND MANAGEMENT

The success or failure of ECD hubs seem to depend largely upon adequate governance structures, institutional arrangements and financial management systems. These are areas that are often neglected, as ECD practitioners focus their energy on their primary role, namely that of a teacher. Many teachers find that they are not equipped to fulfil a managerial role, due to a lack of financial literacy or administrative skills (Carelse, 2010; Van Niekerk, 2010; Mannel, 2010). Conversely, good governance often impacts positively on all areas of work (Annecke, 2010).

The pressures of the day-to-day functioning of an ECD hub is exacerbated by the fact that an overwhelming majority of ECD centres in South Africa are not able to survive on income from tuition fees⁵² (Biersteker & Motala, 2008; Motala, 2009; Gustaffson, 2010). Although supplementary funding channels are available (such as the government subsidy for registered sites), it is often difficult to obtain this funding due to:

- A lack of information regarding possible funding channels.
- A lack of capacity to seek and apply for funding.
- The failure of ECD centres to meet registration criteria.
- Inadequate financial management systems (Van Niekerk, 2010; Carelse, 2010; Stassen, 2010).

In this regard, civil society organisations may have a valuable role to fulfil in assisting ECD hubs to obtain additional funding, negotiate funding conditionalities, meet funding requirements and obtain the skills needed to establish and operate sound financial systems (Mabeba, N, 2010). Civil society organisations, in turn, incorporate the in-depth knowledge of the needs of ECD hubs into their projects and policies, and use this information when they act as advocates for ECD on local, national and global levels (Irwin, Siddiqi & Hertzman, 2007).

5.7 CONCLUSION

This chapter highlighted 5 important themes that draw together the practical and theoretical research components of this study. QDA and sense-making techniques were used to facilitate the emergence of

⁵² See section 3.5 on page 69.

these themes. Firstly, the importance of shifting paradigms was emphasized – from reductionism to an appreciation of complexity and whole systems. Such a paradigm shift depends largely upon the way in which humans relate to and connect with nature. For ECD to be relevant and useful as hub for sustainable community development, the content of education, pedagogy and process of sustainable community development must arise from a deep understanding of the local socio-ecological environment. The fourth theme drew attention to the high capacity requirements of integrated, ecological ECD hubs, as well as the urgent lack of capacity in the ECD sector of South Africa. Finally, the importance of sound management and financial systems was emphasized as an important determinant of the success or failure of ECD hubs.

Chapter 6: Conclusion

6.1 INTRODUCTION

The purpose of this chapter is to conclude the findings from the literature review and the case study coherently. The conclusions are structured according to the study's three research objectives. Opportunities for further scholarship that emerged from this study are highlighted, together with a set of recommendations.

6.2 CONCLUSIONS

6.2.1 Objective 1

The first research objective was to determine whether ECD is a useful point of entry for sustainable community development. From the theoretical research in the literature review and the practical research in the case study, I conclude that ECD does provide a useful entry point to sustainable community development. My reasons for this conclusion can be summarised as follows:

The importance of ECD for the cognitive, physical, social, emotional and spiritual development of children was established⁵³. Early childhood was shown to be a formative time for the development of lifelong values, attitudes, skills and abilities that enable children to be agents of change that contributes to sustainable community development. It was suggested that ECD spaces have the potential to serve as integrated, ecological 'hubs' for sustainable community development. This contributes to the establishment of children-centred communities and enhances the community capabilities for sustainable development that are needed to confront and transform a future likely to be characterised by a host of interrelated and interdependent crises.

I conclude, therefore, that high quality, integrated and ecological ECD presents a useful entry point to the development of sustainable communities.

6.2.2 Objective 2

The second research objective was to establish what an integrated, ecologically orientated approach to ECD might entail. This study emphasized that there is no blueprint for sustainable community development using ECD as entry point. ECD hubs may range from state-of-the-art buildings with sophisticated equipment to a barefoot ECD practitioner establishing an ECD hub under a tree in rural village. My conclusion with regard to the second research objective, therefore, is not to present a fixed list of prerequisites for integrated, ecological ECD hubs, but rather to suggest certain capabilities that facilitate the use of ECD as entry point for sustainable community development.

⁵³ See section 3.4.2 on page 46.

1) Shifting paradigms

Of utmost importance is shifting paradigms from a reductionist conception of ECD toward that of an integrated, ecological hub for sustainable community development. This implies that the core purpose of ECD is no longer only to prepare children for school, but to equip children to be agents of change within their own lives and communities. Furthermore, ECD is fully embedded in the community and actively contributes toward sustainable community development. It might be useful to reduce existing boundaries by asking: “Where can we connect?”.

2) Ensuring relevance

High quality ECD implies that the content and praxis of ECD is relevant for children and their community. In order to determine what relevant ECD might entail, it is useful to ask: “In this context, what capabilities are needed to enable sustainable community development, currently and in the future?”. The answer to this question is contingent upon a thorough examination of the local, national and global context in which the ECD hub is embedded. This includes social, economic, political and environmental issues, as well as the way in which they are interlinked and interdependent.

3) Reconnecting

From this study, it seems fundamentally important to make explicit the links that already exists between children, nature and other forms of life. Understanding that humans form part of an interlinked and interdependent web of life is the first step in the enhancement of capabilities for sustainable development.

4) Ecological learning

Ecological learning in ECD strengthens connections with nature through a profound ecological awareness, a sense of wonder and an understanding of interdependence. The content and methodology of ecological learning is determined by the local socio-ecological context.

5) Capacity

The capacity of the ECD practitioner and supporting staff is an important determinant of the quality, integratedness and depth of ecological learning in an ECD hub. Capacity relates to the ability to deliver high quality ecological ECD, to interact with a wide variety of stakeholders, to provide leadership and to implement and operate sound management and financial systems.

6) Continuous learning and reflexivity

Continuous learning and reflexivity is required to ensure that the ECD programme remains relevant, grounded in context and deeply ecological.

6.2.3 Objective 3

The third research objective is to reflect upon the benefits and limitations of using ECD as entry point for sustainable community development.

Benefits

The principal benefit of integrated, ecological ECD relates to the fact that it promotes children-centred communities where children are central to all policy, planning and developmental initiatives. Thus, children are recognised as important stakeholders in the future of the community, and are prioritised accordingly.

Secondly, integrated ECD seeks not only to facilitate the education and development of young children, but of the entire community in a way that enhances capabilities for sustainable development and benefits the natural environment. This strengthens the social and environmental fabric that supports children as they grow up, which, in effect, reinforces and multiplies the impacts of centre-based ECD.

Thirdly, children become active agents of change and participants in sustainable community development from a young age. Habits of participation and involvement, together with place-based ecological learning, are important ways of equipping children as future leaders and citizens.

Fourthly, integration between children's development and sustainable community development is also an important way to enhance the synergetic effects of various community development initiatives.

Lastly, ECD can be a pathway to sustainable community development in a great variety of contexts. Because the approach and content of integrated, ecological ECD hubs is derived directly from the local socio-ecological environment, it can be adapted to the needs, possibilities and limitations of any context.

Limitations

Many of the limitations to this approach are common to developmental initiatives. The first challenge is a heavy reliance on the capacity of the ECD practitioner(s). To exploit the possibilities for sustainable community development fully, using integrated, ecological ECD as entry point, ECD practitioners are required that are fully trained in ecologically orientated ECD, have the ability to act as sustainable community development practitioners, are able to operate organisational and financial systems, and can interact with and provide leadership to a wide spectrum of stakeholders.

The second limitation is the general lack of financial viability of most ECD centres in South Africa. Tuition fees tend to be inadequate as principle source of income. Additional sources of income are often attained through a government subsidy, partnerships with civil society, or direct relations with benevolent funders. Applying for additional funding is often a challenge, as it requires knowledge about available funding channels, sound and accountable financial systems and adherence to funding prerequisites which might be difficult to achieve.

Thirdly, this approach is premised upon centre-based ECD. Centre-based ECD, however, is one of many approaches to ECD and may not necessarily be the most effective or appropriate response in certain contexts. In South Africa, the vast majority of children do not have access to high quality centre-based ECD in the first place. It is important, therefore, to ensure that the concept of a 'centre' is appropriate to the context (whether it is a solid building, a hut or under a tree), and that other ways of reaching children and communities are also explored.

6.3 RECOMMENDATIONS

The following recommendations are targeted mainly, but not only, at:

- The **OLIVE LEAF Foundation**, that seeks to ‘enable sustainable community development’.
- The **Sustainability Institute**, with the Childhoods Learning Programme and the Learning for Sustainability Programme.
- The **Lynedoch Crèche**, in the value of continuous learning through reflection.
- Any other **private or public sector** initiatives seeking to promote sustainable community development using ED as entry point.

1) Nature

Radical transformation and deep-seated change rests upon the fundamental re-orientation of the relationship between humans and nature. While this re-orientation may be multi-faceted, it rests upon a shift away from humans as conquerors and consumers towards humans as part of the web of life. This necessarily permeates the design of learning spaces, content of education, teaching methodology, operations, and relationships with other entities.

2) Place-based

I re-emphasize the importance of deriving solutions from an integrated knowledge of the complex socio-ecological context that the ECD hub is embedded in. This increases the effectiveness of using ECD as pathway to sustainable community development by ensuring that the process is culturally appropriate and environmentally sound, and that the content of learning is relevant to the needs of the children and their community. Ecological learning, grounded in contextual environmental realities, develops in children and communities a deep awareness of their natural surroundings, an understanding of resource flows and the capabilities for sustainable development.

3) Establish networks

Positioning ECD as an integrated and ecological hub for sustainable community development implies an active effort to link up with similar projects or initiatives in order to build dense networks that work towards the same goal. These networks encourage learning, facilitate community mobilization, promote cooperation and avoid duplication. According to the theory of complexity, small actions within a network can have very large consequences as a result of the interaction between the different elements, creating a condition where the joint outcomes are greater than the sum of the individual parts (Cilliers, 1998).

4) Invest in ECD practitioner capacity

One of the limitations of using ECD as pathway to sustainable development was that it is heavily reliant on teacher capacity. It is imperative, therefore, to invest heavily in ECD practitioners’ capacity – not only as teachers, but also as leaders, sustainable community development practitioners and managers. To this purpose, it may be useful to link up with civil society (see recommendation 5) and to rethink the content of ECD training (see recommendation 6).

5) Dense ties with civil society

Dense ties between ECD hubs and civil society organisations can be mutually beneficial. These organisations (which vary from very small community-based organisations to large international organisations) may be of assistance to ECD hubs by facilitating access to training, providing training, helping the ECD hub to access funding, encouraging connections between similar ECD projects and providing institutional support. In turn, ECD hubs may assist civil society to gain an intimate understanding of grassroots needs and possibilities which inform their programmes and policies and funding decisions, and which help them to fulfil their role as advocates for children at local, national and global levels.

6) Rethink the content of ECD training

It is imperative to ensure that the content of ECD training in South Africa is such that it enables ECD practitioners to successfully fulfil the multiple roles that they are responsible for. Important elements to include in existing curricula may relate to ecological learning, healing, sustainable development, sustainable community development, finances and governance. As the example of the accredited training of the Sustainability Institute demonstrates, these elements can be added to existing accreditation criteria to ensure that the training content is relevant and complete.

6.4 SUGGESTIONS FOR FURTHER SCHOLARSHIP

Due to the limitations of this study, not all areas related to this subject were examined in-depth. In this section, 4 suggestions for further scholarship are given that would build on the knowledge generated by this study.

1) Organisational development for community-based ECD hubs in South Africa.

The concept of community-based ECD hubs is relatively new and unexplored. These hubs receive little guidance in terms of organisational development or structure. It may be useful, therefore, to examine possible models of organisational development for community-based ECD hubs in South Africa in order to advise and support emerging ECD hubs.

2) Towards the financial viability of ECD in South Africa.

Very few ECD centres in South Africa are financially viable. This is an indication of a deeply rooted problem. It may be useful to examine this problem, and to explore the need for systemic transformation to support the financial viability of ECD centres.

3) The development of ECD practitioner capacity in integrated ecological ECD hubs.

While the ECD sector in South Africa is already facing a severe shortage of capacity, the establishment of integrated, ecological ECD hubs places even heavier demands on ECD practitioners. Research as to how this capacity might be increased will contribute to the resolution of this crisis in South Africa, and to the promotion of ECD as pathway to sustainable community development.

4) A collaborative public-private sector strategy for improving the quality of and access to ECD in South Africa.

Both the private and the public sector are doing important work in the promotion of universal high quality ECD, as well as promoting community development, in South Africa. It may be useful to research a collaborative strategy between these sectors in order to enhance synergies, avoid duplication and facilitate communication between these initiatives in order to simultaneously promote high quality ECD and sustainable community development.

6.5 CHAPTER SUMMARY

This chapter presented the final conclusions of the study. The main conclusion is that there are numerous opportunities for integrated, ecological ECD to be a pathway towards sustainable community development. While there are no exhaustive lists of 'requirements' or 'prerequisites' that stipulate what this approach entails, certain 'capabilities' were suggested that may facilitate the process of establishing and operating integrated, ecological ECD hubs. The following benefits of this approach were identified: integrated, ecological ECD hubs promote children-centred communities, develop children's and communities' capabilities for sustainable development, equip children to be agents of change, encourage synergies between various sustainable developmental initiatives and the approach can be adopted in various contexts. Limitations, however, include a heavy reliance on highly capable ECD practitioners in the context of a serious shortage of capacity in South Africa's ECD sector. Furthermore, the majority of ECD institutions in South Africa are not financially viable without additional financial assistance. This is a serious drawback for aspiring ECD practitioners and for the stability of existing ECD hubs. Finally, centre-based ECD approaches may not always be the most effective approach to sustainable community development. It is important for prospective ECD hubs to consider alternatives carefully in order to determine the most appropriate option for the context.

Based on these shortcomings, recommendations include a) the need to reform and expand ECD training in order to equip teachers adequately to establish and operate integrated, ecological ECD hubs, b) denser ties between the ECD sector and civil society groups and c) the importance of using the local context as principle determinant of the content of education, pedagogy and the approach to sustainable community development. Suggestions for further study suggested in section 6.4 build upon the foundation laid by this study and may contribute to the attainment of the recommendations.

APPENDIX A

Interviews

Name	Involvement	Type of Interview	Date of interview
Mannel , Suelle	Current principal of the Lynedoch crèche.	Unstructured	8 June and 15 September 2010
Mabeba , Naledi	Coordinator and trainer of the Childhoods Programme ECD practitioner Former teacher at the Lynedoch crèche. Homeowner in the Lynedoch EcoVillage.	Unstructured	3 March, 12 July and 28 July 2010
Human, Piet	Sociologist and resident of the Lynedoch EcoVillage.	Semi-Structured	22 August 2010
Van Niekerk, Ross	Assistant trainer in the Childhoods Programme Co-founder of the Lynedoch crèche and former principal. Homeowner in the Lynedoch EcoVillage; board member of the LDC.	Unstructured	1 August 2010; 14 September 2010
Gelant , Veronica	Cook at the Lynedoch crèche Homeowner in the Lynedoch EcoVillage	Semi-structured	27 September 2010
Swilling, Mark	Co-founder of the Sustainability Institute and Lynedoch Development.	Semi-structured	29 June 2010
Brooks, Tracy	Head of the Changes youth programme at Lynedoch.	Semi-structured	23 August 2010
Landman , Anri	MPhil student at the Sustainability Institute and local food expert	Structured	16 September
Anneck , Eve	Co-founder and resident of the Lynedoch EcoVillage and Montessori ECD expert; board member of the LDC.	Unstructured	1 August 2010
Worby, Malcolm	Architect involved with the crèche building.	Semi-structured	14 September
Bezuidenhout, Louise	Employee of the Sustainability Institute and prospective home-	Structured	29 July 2010

	owner in the Lynedoch EcoVillage.		
Carelse, Christina.	Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute.	Unstructured	14 April 2010 and 23 August 2010
Mabeba, Phetty	Employee of the Sustainability Institute, resident of the Lynedoch EcoVillage and business advisor to Sigalo Eco Builders CC.	Structured	27 September 2010
Maritz, Doriena	Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute.	Semi-structured	14 April 2010
Mawabo, Siphondo	Sustainable construction worker.	Structured	27 September 2010
Ramsey, Prudence	Montessori ECD expert and assessor of the accredited training programme	Semi-structured	12 August 2010
Skhosana, Elijah	Sustainable construction worker	Structured	27 September 2010
Stassen, Wena	Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute	Semi-Structured	14 April 2010 and 23 August 2010
Stuurman, Annemarie	Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute.	Semi-Structured	14 April 2010
Shaffer, Jean	Former director of the Centre for Social Development, Grahamstown	Semi-Structured	12 August 2010
Van Wyk, Sofia	Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute	Semi-Structured	14 April 2010

APPENDIX B

Selected images



Image B.1: Preparing the soil for the vegetable garden



Image B.2: Happily at work



Image B.3: Cleaning up after themselves



Image B.4: Side view of the Lynedoch Crèche



Image B.5: Front view of the Lynedoch Crèche



Image B.6 – B.8: Children at work



Image B.9: Ecologically designed home in the Lynedoch EcoVilage



Image B.10: Side view of the Sustainability Institute



Image B.11: Organic permaculture community food gardens



Image B.12: Organic permaculture community food gardens

APPENDIX C

Sustainability Institute Level 4 ECD Childhoods Learning Programme: Bank of Information for ID 58761

World Change

1. A world view
2. An appreciative inquiry
3. Ecological perspective
4. A philosophy based on the observation of the natural development of the child
5. Changing attitudes
6. The role and purpose of ECD
7. Introduction to Dr Montessori
8. An overview of educational child theorists

The Child

1. An introduction to how children develop
2. Introducing the four planes of development
3. The first plane and the absorbent mind
4. Second, third and fourth planes of development
5. Learners with special educational needs
6. How children learn – the three period lesson
7. Setting up class room routines to maximise children's learning and correction of errors
8. The needs and tendencies of human beings
9. Sensitive periods of the absorbent mind
10. How the child develops language
11. Development of co-ordinated movement
12. The development of independence
13. Getting ready for school

The Adult

1. Learning skills – mind mapping
2. Solving problems in a school
3. Conflict resolution with adults and children
4. Violence and abuse (anxiety and depression)
5. Working in partnership with families
6. Classroom management
 - a. Observation
 - b. Keeping progress records and reporting to parents
 - c. Working with systems
7. Collection of household and factory resources
8. Money matters (numeracy literacy)
9. How committees work – applied communication skills
10. NQF – Principles of assessment practice
11. An introduction to referencing
12. Second language communication literacy
13. Using the sensorial area to develop own numeracy literacy (9016)
14. Communication literacy level 4
 - a) 119462 – oral – is embedded in above
 - b) 119469 – read – is embedded in above
 - c) 119459 – write – is embedded in above
 - d) 119471 – use – is embedded in above
15. Numeracy Literacy Level 4
 - a) 9015 – statistics – is embedded in above
 - b) 9016 – shape and motion in 2 & 3D space (3.13)
 - c) 7468 – finance – money matters (3.8)

The prepared Environment

1. National Schools Curriculum Learning Areas
2. The Prepared Environment
3. The spiritual preparation of the adult
4. Extending the prepared environment to the outdoors
5. Introduction to social skills
6. Introducing the activities
7. Health, care safety and nutrition (HIV/Aids)
8. Equipment making
9. Practical life activities/life skills learning area
10. Art learning area
11. Sensorial activities – education of the senses
12. Numeracy learning area
13. The role of the adult in the development of the child's communication literacy
14. Literacy/ language learning area
15. Language material making
16. Music and children
17. Introduction to the study of the world
18. The world of people- history
19. The world – geography
20. The world – science
21. The world of plants
22. The world of animals

Healing

1. Listening to your body
2. Meditation
3. Tai chi
4. Pal Dan Gum exercises
5. Hatha Yoga
6. Breathing exercises
7. Hand and foot massage
8. Basic polarity massage
9. Head and shoulder release
10. The holds
11. Visualisation – river of life
12. Guided visualisation for finger labyrinth
13. Finger holds
14. Emotional freedom technique
15. Immune system boost
16. Daily personal ritual
17. Acupressure

APPENDIX D

Budget of the Lynedoch Crèche: January – August 2010

	JANUARY – APRIL 2010							
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual
2010	Jan	Jan	Feb	Feb	Mar	Mar	Apr	Apr
Income	11,583	10,984	11,583	11,684	11,583	12,134	22,083	11,284
Sally Wilton	4,917	4,917	4,917	4,917	4,917	4,917	4,917	4,917
ECD	4,167	4,167	4,167	4,167	4,167	4,167	4,167	4,167
SUBSIDIES							10,500	
Fees	2,500	1,900	2,500	2,600	2,500	3,050	2,500	2,200
Expenses								
Staff costs / Salaries	8,350	3,500	8,350	7,500	8,350	7,950	8,350	11,918
Creche Principal_Suelle	4,000		4,000	4,000	4,000	4,000	4,000	4,000
Creche Teacher_Veronica	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Staff Development	100		100		100		100	4,418
Casual wages	750		750		750	450	750	
Expenses	5,790	2,959	5,790	3,769	5,690	3,469	6,190	2,928
Meals	3,000	2,344	3,000	1,997	3,000	2,969	3,000	2,428
Transport:Condor	300	55	300		300		300	
Transport:Students	840	60	840		840		840	
Materials			500	492			500	
Stationary	500							
Consumables	200		200	361	200		200	
Tracksuits & Bags								
Telephone	50	50	50	50	50	50	50	50
Electricity	250	250	250	250	250	250	250	250
Water	200	200	200	200	200	200	200	200
Maintenance	250		250	420	250		250	
Legal Fees					100		100	
Accounting Fees					100		100	
Audit Fees					200		200	
Misc	200		200		200		200	
TOTAL EXPENSES	14,140	6,459	14,140	11,269	14,040	11,419	14,540	14,846
NETT PROFIT/(LOSS)	(2,557)		(2, 557)	415	(2,457)		7,543	

MAY – AUGUST 2010								
	Budget	Actual	Budget	Actual	Budget	Actual	Budget	Actual
2010	May	May	June	June	July	July	Aug	Aug
Income	22,083	11,184	22,083	11,034	22,083	11,409	22,083	11,634
Sally Wilton	4,917	4,917	4,917	4,917	4,917	4,917	4,917	4,917
ECD	4,167	4,167	4,167	4,167	4,167	4,167	4,167	4,167
SUBSIDIES	10,500		10,500		10,500		10,500	
Fees	2,500	2,100	2,500	1,950	2,500	2,325	2,500	2,550
Expenses								
Staff costs / Salaries	8,350	7,620	8,350	7,500	8,350	9,050	8,350	3,900
Creche Principal_Suelle	4,000	4,000	4,000	4,000	4,000	4,000	4,000	400
Creche Teacher_Veronica	3,500	3,500	3,500	3,500	3,500	3,500	3,500	3,500
Staff Development	100	120	100		100		100	
Casual wages	750		750		750	1,550	750	
Expenses	5,690	3,175	11,690	9,650	6,690	3,315	5,690	-
Meals	3,000	2,881	3,000	2,550	3,000	2,995	3,000	
Transport:Condor	300		300		300	200	300	
Transport:Students	840		840		840	120	840	
Materials					500			
Stationary					500			
Consumables	200	294	200		200		200	
Tracksuits & Bags			6,000	7,100				
Telephone	50		50		50		50	
Electricity	250		250		250		250	
Water	200		200		200		200	
Maintenance	250		250		250		250	
Legal Fees:NPO & PBO reg	100		100		100		100	
Accounting Fees	100		100		100		100	
Audit Fees	200		200		200		200	
Misc	200		200		200		200	
TOTAL EXPENSES	14,040	10,795	20,040	17,150	15,040	12,365	14,040	3,900
NETT PROFIT/(LOSS)	8,043		2,043		7,043		8,043	

APPENDIX E

Example of Gift Certificate



SUSTAINABILITY
INSTITUTE

Wendy Brooks

*are sponsoring the children at Lynedoch Development Crèche for the period of one year
in their journey of learning, living and reinventing their futures*



The Lynedoch early learning approach strives to create space for 40 preschoolers for healing, sustainable living, play and joy through accredited staff, a beautiful learning environment and a place for being.

Donated with abundance by
Robyn Doran

Certificate no 09/009, issued at Lynedoch Eco Village – November 2009
Trust Number IT3011/99 NPO Number 051-245-NPO PBO Number 930020419

Appendix F

Appreciative Inquiry

Notes from the Appreciative Inquiry are summarised below according to the four 'steps' of AI: 'discover, dream, design, destiny'.

Discover

During this session, we set out to discover what it is that gives life to the Lynedoch Crèche. We asked ourselves:

What makes us unique?

What are we proud of?

What are our greatest accomplishments?

What works well?

The outcomes of this session can be summarised as follows.

The crèche was identified as a major source of pride. Identifying the various features and strengths of the crèche stimulated a sense of accomplishment and pride. The discussion included the fact that there is an ecologically designed building, with solar panels, solar geysers and on-site water and waste treatment. The crèche is part of an EcoVillage where children are put first. There are beautiful, extensive gardens and play spaces as well as food gardens where children can plant and pick their own food. Children receive two nutritious meals per day. Furthermore, there are (almost) trained teachers who enjoy extensive support from the entire ECD team (including Eve, Ross, Naledi, Alison and Prudence). The crèche has all the Montessori equipment that it needs, and within the crèche there is diversity in terms of race, language and background.

There is also an aftercare facility for children ranging from age 2 and a half to 18, and a new baby centre was opened in October 2010 to accommodate children aged 0 to 2 and a half.

Another source of joy is the success accredited ECD training programme. Naledi and Ross reports that the demand for the ECD training has grown to such an extent that it is no longer necessary to recruit students, as students approach the Sustainability Institute to request training. They continue to receive positive feedback with regards to the content of the training. According to participants, this training has a unique combination of elements, such as the Montessori approach, the healing, sustainability and the fact that the students are accommodated in the guest house. The training has also been said to be hands-on and interactive. The ripple effect of the training is becoming clear, as schools are requesting training for their other teachers as well. There is an increased demand for alumni support.

Linked to the Lynedoch Crèche is the Lynedoch Primary School with many possibilities for excellence. The Gr. R class, which shares the building with the crèche, provides a useful link between ECD and the primary school. The Gr. R teacher has also completed her ECD training. Even though she chooses not to

adhere to Montessori principles fully, her teaching style and classroom management compliments the work done in the crèche.

We are grateful for consistent funding from a variety of sources. With this funding, we have been able to pay children's tuition fees, meals as well as tracksuits, t-shirts and schoolbags which also contribute to a sense of identity and belonging.

Finally, within Lynedoch there are many who are passionate about ECD, sustainability, community development and ecological learning. There are enough qualified and skilled people with many years of experience in ECD which are willing and able to support the crèche. Furthermore, the crèche is embedded in the Lynedoch EcoVillage, where the community is actively working to ensure that the Lynedoch EcoVillage is a children-centred space. The crèche is thus ideally situated to pursue the goal of being an example of a high quality, integrated, ecological ECD hub.

We were humbled by our achievements, and grateful for all the support that we have. We realised that there really is no limit to the possibilities for ECD at Lynedoch, and that we are very fortunate in terms of our location, resources and support. We recognise that we have come a long way, and that there still is a significant journey ahead. We have much to be proud of, and are inspired by the energy and passion surrounding ECD in Lynedoch.

Dream

We set out to discover what our dreams for the Lynedoch Crèche, and the Lynedoch Valley were. We asked:

What are our dreams for ECD at Lynedoch?

What do we want to see in 5 years' time?

What would be the best for the children of Lynedoch?

Our collective dreams for ECD at Lynedoch are summarised below.

We want a whole new wing – a new, large, state-of-the-art, beautifully designed ecological building. The crèche would be within this building, with a one-way mirror which allows for observation without disturbing the children. There would also be office spaces, training facilities, aftercare, youth club and space for any additional projects relating to the education and well-being of children.

The gardens will be amazing, with many spaces in which to play hide and seek. There will also be sacred and reflective spaces. Even more birds would nest in the Lynedoch EcoVillage, and perhaps we'll also have a cow and a calf. Food gardens will become even more important as a source of nutrition and a way to promote healing through nature.

We dream of expanding the ECD training so that three weeks of the month is spent on training, with one week to do administration. Training programmes should include NQF level 4, 5 and the National Diploma. In order to achieve this, we would have a fully equipped and skilled team. The Lynedoch

EcoVillage should always be full of people doing the ECD training course, and these people should come from all over Africa.

By this time, the crèche would be an exemplar of integrated and ecological ECD. The performance would be at a consistent high quality. We will have fully trained staff who are passionate about children, and who take full responsibility for the crèche and for doing their job exceptionally well.

We want to see much more of healing happening, with children, parents, teenagers, teachers and other community members. In the coming years, we hope to explore additional ways of healing through nature, as well as intergenerational healing where entire families take hands in the journey of healing the society.

Our dream for the aftercare is to improve the overall quality in order to ensure that children have a lovely afternoon. This requires additional planning and preparation, together with a well structured (yet flexible) programme. The aftercare will provide more than homework support. Its purpose would include helping children to stay in school till matric, assist them in the development of social skills, provide care and nurture, and to be strict when necessary. The aftercare will expose children to beautiful spaces, both indoors and in the gardens.

The plans for the FET College are already in the making, and include the Umzi-Wethu programme for the youth, which is a year-long live-in intervention which provides youth with accredited skills training, social support and a job placement for the subsequent year. We hope to expand the FET College to include various accredited skills training courses to enhance the possibilities that the youth of Lynedoch have to attain a qualification and a decent job. These skills programmes will enhance capabilities for sustainable development, through skills such as sustainable construction or permaculture gardening.

Finally, we hope that we will remain rooted in our history, and will continue to celebrate our stories. We will teach our children about the story of Lynedoch and of the Lynedoch valley, and take them for walks so that they can know the area well. We can also show them pictures of the development of the Lynedoch EcoVillage.

Design

In order to achieve the vision outlined in the previous section, the following 'next steps' were identified and discussed.

Support and Improve the crèche

There was agreement that the crèche was not yet where it should be. Current support for the creche includes giving Suelle time off to complete training and the presence of Naledi's in the crèche every morning to help, instruct, give feedback and assess. In order to understand how best to enable the crèche to reach its full potential, we reflected upon the following questions:

- Is the crèche getting enough attention?

- Is the crèche receiving too much support? Is it being nursed too much?
- What is the impact of Naledi's presence?
- Is it possible that Naledi's presence is causing a confusion with regards to roles and responsibilities?

Aftercare

In order to improve the quality of the aftercare, training is required. The organisation PASCAP was identified as an appropriate training provider, and it was suggested that the training could be modified to ensure that it is ecologically orientated. The next step is to secure funding and to set a date for the training. It was also mentioned that the aftercare might be improved by paying more attention to the needs of different age groups, as each age group requires different styles of guidance and supervision. This will require additional space and facilitators. The ECD team will subsequently enter into dialogue with the aftercare staff. In the design of the new children's wing, the need for adequate aftercare space will be kept in mind.

Institutional arrangements

Possible institutional arrangements which would allow each aspect of ECD at Lynedoch grow and develop to its full potential. One possibility that was identified was to change the role of the Sustainability Institute to that of a partner of the crèche. This means that the crèche becomes fully independent, has its own governing board and functions as an entity separate from the Sustainability Institute.

Reasons why this is an option worth exploring include:

- The crèche will be able to make its own, independent decisions;
- This might improve clarity regarding roles and responsibilities;
- The establishment of a governing board will serve to improve accountability;
- There is no longer a safety net. The crèche will assume full responsibility for its own success. It will no longer be possible to place the blame on other people or external factors;
- The crèche will value and appreciate the partnership with the SI (as opposed to being dependent upon the support of the SI);
- This might bring about an improved sense of pride and ownership.

In thinking about a change in the institutional arrangements, it was thought useful to ask:

- How can we help the staff of the crèche to take full responsibility?
- Which arrangement would best enable all involved to purposefully step into their roles?
- What should the partnership between the SI and the crèche entail?
- How do we work together?
- How to configure the funding arrangements?

In a subsequent meeting with Suelle, it was decided to implement this suggestion. While the details are still being finalised, Suelle is 'very excited' about this development and is motivated for the task ahead.

Training

One of the dreams for the training was that there should be much more training. It was said that the biggest restraint was not money, but capacity within the ECD training team. The training programme currently offers NQF level 4 and 5 certificates as well as the level 5 National Diploma. Naledi is the facilitator for the certificate training courses, but only Eve and Prudence are qualified to train for the National Diploma. Prudence is currently the only person who is qualified as an assessor, and consequently does all the assessments.

The discussion about the way forward can be summarised as follows:

Firstly, each person needs to reflect on her own career path, as well as her role within the wider vision for ECD at Lynedoch. What course of action could be followed to improve both individual and collective capabilities?

Secondly, everyone must jointly discuss the next steps as a training team. This will entail a stock-take of skills, looking at each person's aspirations, and finding ways to improve the collective capacity within the team.

A third way to improve capacity is to enrol in generic assessor/moderator accreditation courses. This will serve the purpose of lifting a burden from Prudence's shoulders, increasing individual skill levels, and enabling the trainers to follow up on and assess the people that they trained, instead of having to send Prudence to do it.

Fourthly, establish which skills and capabilities are needed to establish the Sustainability Institute's own comprehensive train-the-trainers programme. Prudence might be a useful resource person to consult.

Finally, it is necessary to find out which legal arrangements are needed to attain Higher Education and Training (HET) training accreditation for the FET College, and to explore a possible partnership with the University of Stellenbosch for the level 5 National Diploma training.

Destiny

Which inspired actions support ongoing learning and innovation?

- Pursuing appropriate staff training and enrichment in accordance with each person's career trajectory, as well as the needs of the ECD team as a whole.
- Share experiences with the rest of the team.
- Convening on a regular basis to assess progress and determine possible ways forward.

BIBLIOGRAPHY

1. Acemoglu, D., Johnson, S. & Robinson, J. 2005. "Institutions as the Fundamental Cause of Long-Run Growth," *In* Aghion, P. & Durlauf, S. (eds). *Handbook of Economic Growth*. Amsterdam: Elsevier.
2. Aghion, P. and Howitt, P. 1998. *Endogenous Growth Theory*. Cambridge, MA: MIT Press
3. Annecke, E. 2010. *Co-founder and resident of the Lynedoch EcoVillage and Montessori ECD expert; board member of the LDC*. [personal interview]. 1 August.
4. Backstrand, G. & Ingelstam, L. 2006. "Enough! Global challenges and responsible lifestyles". *Development Dialogue*. 1 (47): 97-147.
5. Ball, J. 2005. "Early childhood care and development programs as 'hook' and 'hub' for inter-sectoral service delivery in First Nations communities". *Journal of Aboriginal Health*. 2: 1-43.
6. Barnett, S., Belfield, C.R., Nores, M. & Schweinhart, L. 2006. "The High/Scope Perry Preschool Program: Cost-Benefit Analysis Using Data from the Age-40 Follow Up". *The Journal of Human Resources*. 41 (1): 162 – 190.
7. Barnett, W.S. & Ackerman, D.J. 2006. "Costs, Benefits and Long-Term Effects of Early Care and Education Programs: Recommendations and Cautions for Community Developers". *Journal of the Community Development Society*. 37 (2): 86-100.
8. Barnett, W.S. & Ackerman, D.J. 2006. "Costs, Benefits and Long-Term Effects of Early Care and Education Programs: Recommendations and Cautions for Community Developers". *Journal of the Community Development Society*. 37 (2): 86-100.
9. Barnett, W.S. 1985. "The Perry Preschool Programme and its long term effects: a cost-benefit analysis". *High/Scope Early Childhood Policy Papers*. No. 2. pp 1 – 124.
10. Barnwell, S.S., Borders, A. & Earleywine, M. 2006. "Alcohol-aggression expectancies and dispositional aggression moderate the relationship between alcohol consumption and alcohol-related violence". *Aggressive Behaviour*. 32 (6): 517 – 527.
11. Bell, A.C. & Dymont, J.E. 2008. "Grounds for health: the intersection of green school grounds and health-promoting schools". *Environmental Education Research*. 14 (1): 77 – 90.
12. Bentley, R.W. 2009. *An explanation of Oil Peaking*. University of Reading: UK. [online]. Available: <http://www.aspousa.org/index.php/newsletters/peak-oil-review/file-library/?dl_cat=6> (4 October 2010)

13. Bezuidenhout, L. 2010. *Employee of the Sustainability Institute and prospective home-owner in the Lynedoch EcoVillage*. [personal interview]. 29 July.
14. Bidwai, P. 2006. "From *What Now?* to *What Next?* Reflections on three decades of international politics and development.". *Development Dialogue*. 1:31-63
15. Biersteker, L. & Louw, L. 2006. *Indicators for Early Childhood Development - Report for the research directorate department of social services & poverty alleviation: Provincial Government of the Western Cape*. Cape Town: HSRC.
16. Biersteker, L. & Motala, S. 2008. *Towards a job hierarchy for ECD provision and supervision in South Africa, and the fit of low-skill service providers*. ECD Knowledge Building Seminar. Cape Town: HSRC.
17. Biersteker, L., Streak, J. & Gwele, M. 2008. *Toward an adequate ECD centre subsidy for children under 5 in South Africa: a costing of centre delivery*. The Consultative Group on Early Childhood Care and Development. Toronto.
18. Birkeland, J. 2002. *Design for Sustainability: A sourcebook of integrated eco-logical solutions*. London: Earthscan.
19. Birkeland, J. 2008. *Positive Development: From vicious circles to virtuous cycles through built environment design*. London: Earthscan.
20. Birkeland, J. 2009. *Communicating ecologically positive development*. Proceedings from the Fifth International Conference of the Association of Architecture Schools in Australasia, 4 - 5 September 2009. Wellington: Victoria University.
21. Brooks, T. 2010. *Leader of the Lynedoch Youth Programme*. [personal interview]. 23 August.
22. Brundtland, G. (ed.) 1987. *Our Common Future: The World Commission on Environment and Development*. Oxford: Oxford University Press.
23. Butler, A. 2010. "Consolidation first: institutional reform priorities in the creation of a 21st century developmental state in South Africa" In Edighedji, O. (ed.). *Constructing a democratic developmental state in South Africa: potentials and challenges*. Cape Town: HSRC Press.
24. Capra, F. 1996. *The Web of Life*. London: HarperCollins.
25. Carelse, C. 2010. *Teacher at the Oude Muragie Jubilee Preschool and student of the accredited ECD training programme of the Sustainability Institute*. [personal interviews]. 14 April and 23 August.
26. Carson, R.L. 1956. *The Sense of Wonder*. New York: Harper & Row Publishers.

27. Chambers, R. 1992. *Real-life Economics: Understanding Wealth-Creation*. New York: Routledge.
28. Chilton, M., Chyatte, M. and Breaux, J. 2007. "The negative effects of poverty and food insecurity on child development". *Indian Journal of Medical Research*. 126: 262 – 272.
29. Cilliers, P. 1998. *Complexity and Postmodernism*. New York: Routledge.
30. Cilliers, P. 2000a. "Knowledge, Complexity and Understanding". *Emergence*. 2 (4): 7-13.
31. Cilliers, P. 2000b. "What can we learn from a theory of complexity?". *Emergence*. 2 (1): 23-33.
32. Cilliers, P. 2001. "Boundaries, Hierarchies and Networks in Complex Systems". *International Journal of Innovation Management*. 5 (2): 135-147.
33. Clayton, A.M.H. & Radcliffe, N.J. 1996. *Sustainability: A Systems Approach*. London: Earthscan Publications Ltd.
34. *Collins English Dictionary- complete & unabridged 10th edition*. 2009. "bantu" [online]. Available: <<http://dictionary.reference.com/browse/Bantu>> (11 October 2010).
35. Constitution of the Republic of South Africa. 1996. *Government Gazette of South Africa* (Cape Town) nr. 378 (17678). 18 December 1996.
36. Davis, J. 1998. "Young Children, Education and the Environment". *Early Childhood Education Journal*. 26 (2): 117.
37. Davis, J., Enghdal, I., Otieno, L., Pramling-Samuelson, I., Siraj-Blatchford, J. & Vallabh, P. 2009. "Early Childhood Education for Sustainability: Recommendations for Development". *International Journal of Early Childhood*. 41 (2): 113-117.
38. De Haan, B.M.J., Reid, V., Volein, A., & Johnson, M. 2004. "Maternal personality and infants' neural and visual responsivity to facial expressions of emotion". *Journal of Child Psychology and Psychiatry*. 45 (7): 1209 – 1218.
39. Dervin, B. 1998. "Sense-making theory and practice: an overview of user interests in knowledge seeking and use". *Journal of Knowledge Management*. 2 (2): 36 – 47.
40. Devezeaux, J.G. 2000. *Environmental Impacts of Energy Generation*. The Uranium Institute 25th Annual Symposium: 30 August-1 September 2000: London. [online]. Available: <<http://www.world-nuclear.org/sym/2000/pdfs/devezeaux.pdf>> (9 October)
41. Diaz, J.R. 2008. "Toward a new environmental contract in education". In Gonzalez-Gaudiano, E. & Peters, M.A. (eds). *Environmental Education: Identity, Politics and Citizenship*. Rotterdam: Sense Publishers.

42. Didonet, V. 2008. "Early childhood development for a sustainable society" In Pramling-Samuelsson, I. & Kaga, Y. (eds). *The contribution of early childhood development to a sustainable society*. Paris: UNESCO. pp. 25-30.
43. *Dorland's Medical Dictionary for Health Consumers*. 2007. "bodywork" [online]. Available: <<http://medical-dictionary.thefreedictionary.com/bodywork>> (11 October 2010).
44. Dresner, S. 2002. *The Principles of Sustainability*. London: Earthscan.
45. Dymont, J.E. 2005. *Gaining ground: the power and potential of green school grounds in the Toronto District School Board*. [online]. Available: <www.evergreen.ca/en/lg/lg-resources.html> (10 September 2010).
46. Edighedji, O. 2010. "Constructing a democratic developmental state in South Africa: potentials and challenges". In Edighedji, O. (ed.). *Constructing a democratic developmental state in South Africa: potentials and challenges*. Cape Town: HSRC Press.
47. Edward B. Barbier. *A Global Green New Deal*. Keynote Address, European Environment Bureau Conference Finding the New Path: A More Strategic Role for Sustainable Consumption and Production. Brussels, Belgium. May 2009.
48. Edwards, C.P. 2002. "Three Approaches from Europe: Montessori, Waldorf and Reggio Emilia". *Early Childhood Research and Practice*. 4 (2).
49. Edwards, C.P. 2003. "'Fine Designs' from Italy: Montessori Education and the Reggio Approach". *Montessori LIFE*. Winter 34-39 [online]. Available: <<http://digitalcommons.unl.edu/cgi/viewcontent.cgi?article=1019&context=famconfacpub>> (4 October 2010).
50. Esping-Andersen, G. 2002. *Why we need a new welfare state*. New York: Oxford University Press.
51. Evans, P. B. 2005. "Challenges of the 'Institutional Turn': Interdisciplinary Opportunities in Development Theory," In Nee, V. & Swedberg, R. (eds.). *The Economic Sociology of Capitalism*. Princeton, NJ: Princeton University Press.
52. Evans, P.B. 2002. "Collective Capabilities, Culture, and Amartya Sen's *Development as Freedom*". *Studies in comparative International Development*. 37 (2): 54-60.
53. Evans, P.B. 2007. *In search of the 21st century developmental state*. University of California: Berkeley. [online]. Available: <[http://iicas.ucsd.edu/.../Evans per cent2021st per cent20Cent per cent20Devel per cent20State per cent20v3.1 per cent20July per cent202007.doc](http://iicas.ucsd.edu/.../Evans%20per%2021st%20per%20Cent%20per%20Devel%20per%20State%20v3.1%20per%20July%202007.doc)> (14 September 2010).

54. Evans, P.B. 2010. "Constructing the 21st century developmental state: pitfalls and potentialities" In Edighedji, O. (ed.). *Constructing a democratic developmental state in South Africa: potentials and challenges*. Cape Town: HSRC Press.
55. Feeney, S. & Moravcik, E. 1987. "A thing of beauty: Aesthetic development of young children". *Young Children*. September: 7-15.
56. Fjørtoft, I. & Sageie, J. 2000. "The Natural Environment as a Playground for Children: Landscape description and analyses of a natural playscape". *Landscape and Urban Planning*. 48 (1-2): 83-97.
57. Flyvbjerg, B. 2006. "Five Misunderstandings about Case-Study Research". *Qualitative Inquiry*. 12 (2): 219-254.
58. Folke, C.; Carpenter, S., Elmqvist, L.G., Holling, C.S., Walker, B., Bengtsson, J., Berkes, F., Colding, J., Nanell, K., Falkenmark, M., Gordon, L., Kaspersen, R., Kautsky, N., Kinzig, A., Levin, S., Maler, K., Moberg, F., Ohlsson, L., Ostrom, E., Reid, W., Rockstrom, J., Savenije, H. and Svedin, U. 2002. *Resilience and Sustainable Development: Building adaptive capacity in a world of transformations*. Stockholm: EDITA NORSTEDTS TRYCKERI AB.
59. Freire, P. 1972. *Pedagogy of the Oppressed*. Middlesex: Penguin Books.
60. Gage, F.H. 2003. "Brain, Repair Yourself". *Scientific America*. 289: 46-53.
61. Gallopin, G. (2003). *A Systems Approach to Sustainability and Sustainable Development*. Report 64. Sustainable Development and Human Settlements Division. Santiago, Chile: Economic Commission for Latin America.
62. Gelant, V. 2010. *Cook and teaching assistant at the Lynedoch Crèche and resident of the Lynedoch EcoVillage*. [personal interview]. 27 September.
63. Giarelli, E., Clarke, D.L., Catching, C. & Ratcliffe, S.J. 2009. "Developmental disabilities and behavioural problems among school children in the Western Cape of South Africa". *Research in Developmental Disabilities*. 30: 1297-1305.
64. Gray, R., Mukherjee, R.A.S. & Rutter, M. 2009. "Alcohol consumption during pregnancy and its effects on neurodevelopment: what is known and what remains uncertain". *Addiction*. 104 (8): 1270-1273.
65. Greenspan, S.I. & Shanker, S.G. 2004. *The first idea: how symbols, language and intelligence evolved from our primate ancestors to modern humans*. Cambridge, MA: Da Capo Press.
66. Gustafsson, M. 2010. *Policy note on pre-primary schooling: an empirical contribution to the 2009 Medium Term Strategic Framework*. Department of Economics and the Bureau of Economic

Research at the University of Stellenbosch: Stellenbosch. [online]. Available:
www.ekon.sun.ac.za/wpapers/2010/wp052010/wp-05-2010.pdf (4 October 2010).

67. Hagglund, S. & Pramling-Samuelson, I. 2009. "Early Childhood Education and Learning for Sustainable Development and Citizenship". *International Journal of Early Childhood*. 41 (2): 49-63.
68. Halliday, S. 2008. *Sustainable construction*. Burlington, MA: Elsevier.
69. Hart, R.A. 1997. *Children's Participation: the theory and practice of involving young citizens in community development and environmental care*. New York: UNICEF.
70. Hase, A., Rouget, M., Maze, K. & Helme, N. 2003. *A Fine-Scale Conservation Plan for Cape Lowlands Renosterveld: Technical Report*. Botanical Society of South Africa: Cape Conservation Unit. Claremont.
71. Haskins, C. 2010. "The Montessori Method". *The Journal of Unschooling and Alternative Learning*. 4 (8).
72. Hattingh, J. 2001. "Conceptualizing Ecological Sustainability and Ecologically Sustainable Development in Ethical Terms: Issues and Challenges". *Annale*. 2.
73. Hawken, P. 2007. *Blessed Unrest: how the largest social movement in the world came into being and why no one saw it coming*. New York: Viking.
74. Heckman, J.J. 2006, "Investing in Disadvantaged Young Children is an Economically Efficient Policy". *Building the Economic Case for Investments in Preschool*. Committee for Economic Development. New York: January 10th.
75. Helpman, E. 2004. *The Mystery of Economic Growth*. Cambridge, MA: Harvard University Press.
76. Herbert, T. 2008. "Eco-intelligent education for a sustainable future life". In Pramling-Samuelsson, I & Kaga, Y. (eds). *The contribution of early childhood development to sustainable societies*. Paris: UNESCO. 63-66.
77. Hicks, D. & Holden, C. 2007. "Remembering the future: what do children think?". *Environmental Education Research*. 13 (4): 501-512.
78. Hodgett, S. 2008. "Sen, culture and expanding participatory capabilities in Northern Ireland". *Journal of Human Development*. 9 (2): 165-183.
79. Hoff, K. and Stiglitz, J. 2001. "Modern Economic Theory and Development". In Meier, G. and Stiglitz, J. (eds.) *Frontiers of Development Economics*. New York, NY: Oxford University Press.
80. Holliday, A. 2002. *Doing and Writing Qualitative Research*. London: Sage Publications.

81. Hornby, D. 2005, "A community development approach to early childhood: children- our future communities". *Work 2005: The Expanded Public Works Programme in the Social Sector*. Cape Town: HSRC.
82. Human, P. 2010. *Sociologist and resident of the Lynedoch EcoVillage*. [personal interview]. 22 August.
83. Hyden, G. 2006. "Civil Society: What Next?". *Development Dialogue*. 1 (47): 183-201.
84. International Assessment of Agricultural Knowledge, Science and Technology for Development. 2008. *Executive Summary of the Synthesis Report*. Island Press: Washington.
85. International Energy Agency (IEA). (2008) *World Energy Outlook 2008: Executive Summary*. [Online] Available: <<http://www.worldenergyoutlook.org/2008.asp> 27 September 2009> (4 October 2010).
86. International Energy Agency. 2008. *World Energy Outlook*. Paris: International Energy Agency.
87. International Panel on Climate Change. 2007. *Climate Change 2007: Synthesis Report*. Geneva, Switzerland: IPCC.
88. International Union for Conservation of Nature (IUCN). 2001. *Caring for the Earth: A strategy for sustainable living*. Switzerland: Gland.
89. Irwin, L.G., Herzman, C. & Siddiqi, A. 2007. *Early Child Development: a powerful equaliser*. Final report of the early child development knowledge network (ECD-KN) for the World Health Organization's Commission on the Social Determinants of Health. [online]. Available: <www.who.int/social_determinants/.../ecd_kn_report_07_2007.pdf> (4 October 2010).
90. Jagwanth, S. 2003. *Democracy, Civil Society and the South African Constitution: some challenges*. UNESCO: MOST programme. [online]. Available: <<http://unesdoc.unesco.org/images/0012/001295/129557e.pdf>> (23 September 2010)
91. Jaramillo, A. & Mingat, A. 2006. *Early childhood care and education in Sub-Saharan Africa: What would it take to meet the millennium development goals?*. Association for the development of education in Africa. Libreville: Gabon. March 27 – 31.
92. Knight, S. 2009. *Forest Schools and Outdoor Learning in the Early Years*. London: Sage Publications Inc.
93. Knudsen, E.I. 2004. "Sensitive periods in the development of the brain and behaviour". *Journal of Cognitive Neuroscience*. 16: 1412 – 1425.

94. Kolybaschkina, N. 2005. "Roots and fruits of community development. Literature review of theories and policies". *Prepared for INTA's International Conference on Civil Society and Community Development*. Amman: Jordan. April 18 – 20th.
95. Kotzé, H. 2003. "Responding to the growing socio-economic crisis? A review of civil society in South Africa". *Development Update*. Annual Review. 4 (4). [Also published in *CCS Research Report Series*, Report no. 19. 2004].
96. Kramer, R. 1977. *Maria Montessori: A Biography*. Toronto: Longman Canada Limited.
97. Lamers, N. 2008. "Cochabamba and Colorado Conjoined: place-based education for a global perspective of environmental issues" In Gonzalez-Gaudiano, E. and Peters, M.A. (eds.). *Environmental Education: Identity, Politics and Citizenship*. Rotterdam: Sense Publishers.
98. Landman, A. 2010. *MPhil student at the Sustainability Institute and local food expert*. [personal interview]. 16 September.
99. Le Grange, L. 2008. "Towards a language of probability for sustainability education in (South) Africa." In Gonzalez-Guadiao, E. & Peters, M.A. (eds). In *Environmental Education: Identity, Politics and Citizenship*. Rotterdam: Sense Publishers.
100. Lehtonen, M. 2004. "The environmental–social interface of sustainable development: capabilities, social capital, institutions". *Ecological Economics*. 49: 199 – 214.
101. Letseka, M. & Maile, S. 2008. *High University Drop Out Rates: A Threat to South Africa's Future*. HSRC. [online]. Available: <<http://www.hsrc.ac.za/Document-2717.phtml>> (12 September 2010)
102. Levy, J.S. 2008. "Case studies: Types, Designs, and Logics of Inference". *Conflict Management and Peace Science*. 25:1-18.
103. Littledyke, R. 2007. "Making a difference: Outdoor education in early childhood education" In Filho, W.L., Manolas, E.I., Sotirakou M.N. & Boutakis G.A. (eds). *Higher Education and the Challenge of Sustainability: Problems, Promises and Good Practice*. Environmental Education Center of Soufli: Greece.
104. Lotz-Sisitka, H. 2009. "Utopianism and educational processes in the United Nations Decade of Education for Sustainable Development: a critical reflection". In Corcoran, P.B. & Osano, P.M. (eds). *Young people, education and sustainable development: exploring principles, perspectives and praxis*. The Netherlands: Wageningen Academic Publishers.
105. Louv, R. 2008. *Last child in the woods: saving our children from nature deficit disorder*. New York: Algonquin Books.

106. Lucas, R. 1988. "On the Mechanics of Economic Development." *Journal of Monetary Economics*. 22: 3-42.
107. Ludema, J.D. & Fry, R.E. 2007. "Appreciative Inquiry". In Reason, P. & Bradbury, H. (eds.). *The Sage Handbook of Action Research: Participative Inquiry and Practice*. 2nd edn. London: SAGE Publications.
108. Lynch, R.G. 2004. *Exceptional Returns: Economic, Social and Fiscal benefits of Investment in Early Childhood Development*. Washington: Economic Policy Institute.
109. Maaga, T. 2008. "Opening Address". In Viviers, A. & Mabuchi, J. (eds.). *Nation building from the start: ECD knowledge building seminar*. South Africa: UNESCO. [online]. Available: <www.unicef.org/southafrica/SAF_resources_kbsreport.pdf> (10 March 2010).
110. Mabeba, N. 2010. *Resident of the Lynedoch EcoVillage, ECD trainer and Montessori expert; board member of the LDC*. [personal interviews]. 3 March, 12 July and 28 July.
111. Mabeba, P. 2010. *Employee of the Sustainability Institute, resident of the Lynedoch EcoVillage and business advisor to Siqalo Eco Builders CC*. [personal interview]. 27 September.
112. MacQueen, K.M., McLellan, E., Metzger, D.S., Kegeles, S., Strauss, R.P., Scotti, R., Blanchard, L. & Trotter, R.T. 2001. "What is community? An evidence-based definition for participatory public health". *American Journal of Public Health*. 91 (12): 1929 – 1938.
113. Macy, J. & Young-Brown, M. 1998. *Coming Back to Life*. British Columbia: New Society.
114. Mamdani, M. 1996. *Citizen and Subject: Contemporary Africa and the Legacy of Late Colonialism*. Cape Town: David Philip Publishers.
115. Mannel, S. 2010. *Principal of the Lynedoch Crèche*. [personal interview]. 8 June and 15 September.
116. Marchuk, S. 2007. "Drivers and Barriers to Pre-School Education for Sustainable Development" In Björneloo, I. & Nyberg, E. (eds). *Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education*. France: UNESCO.
117. Maritz, D. 2010. *Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute*. [personal interview]. 14 April.
118. Mawabo, S. 2010. *Sustainable construction worker*. [personal interview]. 27 September.
119. Max-Neef, M.A. 1992. "Development and Human Needs: Latin America: crisis and perplexity". In Ekins, P. & Max-Neef, A. (eds). *Real Life Economics: Understanding Wealth Creation*. London: Routledge. p. 197–213.

120. Max-Neef, M.A. 2005. "Foundations of Transdisciplinarity". *Ecological Economics*. 53: 5-16.
121. McCain, N.M., Mustard, J.F. & Shanker, S. 2007. *Early Years Study 2: Putting Science into Action*. Toronto: Council for Early Child Development. [online]. Available: <www.councilecd.ca/files/downloads/Early_Years.pdf> (10 September 2010).
122. McLaren, D. 2003. "Environmental Space, Equity and the Ecological Debt" In Agyeman, J., Bullard, R.D. & Evans, B. (eds). *Just sustainabilities: Development in an Unequal world*. London: Earthscan. pp. 19 – 37.
123. Meadows, D.H. et al. 1972. *The Limits to Growth*. New York: Universe Books.
124. Mebratu, D. 1998. "Sustainability and Sustainable Development: historical and conceptual review". *Environment Impact Assessment Review*. 18: 493-520.
125. Miller, J.P. 2004. "Nourishing the Spiritual Embryo: The Educational Vision of Maria Montessori". *Encounter: Education for Meaning and Social Justice*. 17 (2): 14-21.
126. Modell, S. 2005. "Triangulation between case study and survey methods in management accounting research: An assessment of validity implication". *Management Accounting Research*. 16: 231-254.
127. Monaheng, T. 2000. "Community development and empowerment. Unit 9". In De Beer, F. & Swanepoel, H. (eds.). *Introduction to development studies*. Oxford: University Press. 124 – 135.
128. Montessori, M. 1974. *The discovery of the child*. USA: Ballantine Books.
129. Morin, E. 1999. *Homeland Earth- A manifesto for the New Millennium*. Cresshill: Hampton Press.
130. Motala, S. 2009, "Scaling up Early Childhood Development (ECD) (0-4 years) in South Africa". *ECD Indaba*. Cape Town: HSRC.
131. Mouton, J. 2001. *How to succeed in your master's and doctoral studies: a South African guide and resource book*. Pretoria: Van Schaik.
132. National Energy Regulator of South Africa. 2010. *NERSA's decision on ESKOM's required revenue application – multi-year price determination 2010/11 to 2012/13 (MPD 2)*. Media Statement. 24 February 2010. [online]. Available: <<http://www.nersa.org.za/>> (10 October 2010).
133. Nederveen Pieterse, J. 2001. *Development Theory. Deconstructions/Reconstructions*. London: Sage.
134. Noddings, N. 2005. *Educating citizens for global awareness*. New York: Teachers College Press.

135. OLIVE LEAF Foundation & Sustainability Institute. 2010. *Enabling Sustainable Community Development: An Introduction*. Learner Manual: Level 5.
136. Omar, A.M. 2008. "Energy, environment and sustainable development". *Renewable and Sustainable Energy Reviews*. 12 (9): 2265 – 2300.
137. Online Etymology Dictionary. 2010. "agriculture" [online]. Available: <http://dictionary.reference.com/browse/agriculture> (19 October).
138. Orr, D. 1992. *Ecological Literacy: Education and the transition to a postmodern world*. New York: State University of New York Press.
139. Orr, D. 1994. *Earth in Mind: On Education, Environment and the Human Prospect*. Washington, DC: Island Press.
140. *Oxford Dictionaries*. 2010. "community" [online]. Available: < <http://www.oxforddictionaries.com/definition/community?view=uk> > (10 October 2010).
141. Patel, R. 2007. *Stuffed and Starved – the hidden battle for the world food system*. Great Britain: Portbello Books Ltd.
142. Pearson, E. & Degotardi, S. 2009. "Education for Sustainable Development in Early Childhood Education: A global solution to local concerns?". *International Journal of Early Childhood*. 41 (2): 97-112.
143. Philips, S., Matusko, J. & Tomasovic, E. 2007. "Reconsidering the relationship between alcohol and lethal violence". *Journal of interpersonal violence*. 22 (1): 66 – 84.
144. Pramling-Samuelsson, I. & Kaga, Y. 2010. "Early Childhood Education to Transform Cultures for Sustainability" In Mastny, L. & Starke, L. (eds). *World Watch Institute: Transforming cultures from consumerism to sustainability*. New York: W.W. Norton and Company. pp. 57-61.
145. Pressoir, E. 2008. "Preconditions for young children's learning and practice for sustainable development". In Pramling-Samuelsson, I. & Kaga, Y. (eds). *The contribution of early childhood development for sustainable societies*. Paris: UNESCO. pp. 57-62.
146. Ramsey, P. 2010. *Montessori ECD expert and assessor of the accredited training programme*. [personal interview]. 12 August.
147. Republic of South Africa 2005. *National Integrated Plan for Early Childhood Development*. Pretoria: Government Printers.
148. Republic of South Africa. Department of Education. 1995. *White paper on education and training*. Pretoria: Government Printer.

149. Republic of South Africa. Department of Social Development. 2007. *What must be done to register an early childhood development (ECD) centre?* [online]. Available: <<http://www.info.gov.za/speeches/2007/07101212151001.htm>> (4 October 2010)
150. Republic of South Africa. Department of Water Affairs and Forestry. 2005. *Media Release: water shortage a reality for South Africa*. [online]. Available: <www.dwaf.gov.za/Communications/.../WaterShortage18Jan05.docnesa> (11 October 2010).
151. Republic of South Africa. Department of Basic Education. 2010. *School Realities*. Pretoria: Government Printer.
152. Republic of South Africa. Department of Basic Education. 2010. *Education for All (EFA) 2009: Country Report*. Pretoria: Government Printer.
153. Republic of South Africa. Department of Social Development. 2005. *Position Paper on Early Childhood Care and Development*. Pretoria: Government Printer.
154. Rist, G. 2006. "Before thinking about 'What Next?': Prerequisites for alternatives". *Development Dialogue*. 1 (47): 65-96.
155. Rodrik, D. 1999. "Institutions for High-Quality Growth: What Are They and How to Acquire Them". Paper presented at IMF conference: *Second-Generation Reforms*. Washington, DC: November 8-9.
156. Rodrik, D., Subramanian, A., & Trebbi, F. 2004. "Institutions Rule: The Primacy of Institutions over Geography and Integration in Economic Development." *Journal of Economic Growth*. 9: 131-165.
157. Rogers, P., Jalal, K.F. & Boyd, J. 2005. *An introduction to sustainable development*. Canada: Harvard University and Glen Education Foundation.
158. Sandhu, A.K. 2008. "The Montessori Classroom: Is it enough for the 21st century?". [online]. Available: [isites.harvard.edu/.../Sandhu-Analysis-the per cent20Montessori per cent20Classroom.doc](http://isites.harvard.edu/.../Sandhu-Analysis-the%20per%20cent20Montessori%20per%20cent20Classroom.doc) (4 October 2010).
159. Schore, A.N. 1994. *Affect regulation and the origin of self: the neurobiology of emotional development*. Hillsdale NJ: Lawrence Erlbaum Associates.
160. Schulschenk, J. 2010. *Benefits and limitations of local food economies to promote sustainability: A Stellenbosch case study*. Stellenbosch: University of Stellenbosch. MPhil thesis.
161. Seidel, J.V. 1998. *Qualitative Data Analysis*. [online]. Available: www.qualisresearch.com (originally published as "Qualitative Data Analysis" in *The Ethnograph v5.0: A Users Guide*. Appendix E. 1998. Colorado: Qualis Research).
162. Sen, A. 1999. *Development as Freedom*. New York: Alfred A. Knopf.

163. Schäfer, J. 2010. *Former director of the Centre for Social Development, Grahamstown*. [personal interview]. 9 August.
164. Shumba, O., Kasembe, R., Mukundu, C. & Muzenda, C. 2008. "Environmental sustainability and quality education: perspectives from a community living in a context of poverty". *Southern African Journal of Environmental Education*. 25: 81-97.
165. Skhosana, E. 2010. *Sustainable construction worker*. [personal interview]. 27 September.
166. Stassen, W. 2010. *Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute*. [personal interviews]. 14 April and 23 August.
167. Statistics South Africa. 2008. *General household survey 2008*. Pretoria: Statistics SA.
168. Stellenbosch Municipality. 2007. *Integrated Development Plan*. Compiled in terms of the Local Government Municipal Systems Act, 2000 (Act 32 of 2000). [online]. Available: www.stellenbosch.org (8 October 2010).
169. Sterling, S. 2009. *Sustainable education: re-visioning learning and change*. Devon: Green Books.
170. Stiglitz, J. E. 2002. *Globalization and Its Discontents*. Great Britain: Penguin Press.
171. Stone, M.K. 2009. *Smart by Nature: Schooling for sustainability*. California: Watershed Media.
172. Stuurman, A. 2010. *Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute*. [personal interview]. 14 April.
173. Sustainability Institute. 2009. *The Stellenbosch Landfill is Full*. Stakeholder workshop hosted by the Sustainability Institute at the Lynedoch EcoVillage. 9 July 2009. [online]. Available: < <http://www.sustainabilityinstitute.net/home-mainmenu-33/261-stellenbosch-landfill-is-full> > (10 October 2010).
174. Sustainability Institute. 2010. [online]. Available: < www.sustainabilityinstitute.net > (10 October 2010).
175. Sutton, A. 2009. "Educating for Ecological Sustainability: Montessori Education Leads the Way". *Montessori Life*. 21 (4): 18-26.
176. Sutton, S.E. & Kemp, S.R. 2002. "Children as partners in neighbourhood placemaking: Lessons from intergenerational design charrettes". *Journal of Environmental Psychology*. 22 (1-2): 171 – 189).

177. Swarts, E. 2010. *Local emerging organic farmer and resident of the Lynedoch EcoVillage* [personal interview]. 27 July.
178. Swilling, M. & Annecke, E. 2004. "An experiment in living and learning in the Boland". In Pieterse, E. & Meintjies, F. (eds.). *Voices of the Transition*. Johannesburg: Heinemann.
179. Swilling, M. & Annecke, E. 2006. "Building sustainable neighbourhoods in South Africa: learning from the Lynedoch case". *Environment and Urbanization*. 18 (2): 315 – 332.
180. Swilling, M. & Annecke, E. Forthcoming. *Sustainable Futures: A Southern Perspective*. Stellenbosch: South Africa.
181. Swilling, M. 2008. "Greening public value: The sustainability challenge". In Bennington, J. & Moore, M. (eds.). *In search of public value: beyond private choice*. London: Palgrave.
182. Swilling, M. 2010. "Growth, Resource Use and Decoupling: Towards a 'Green New Deal' for South Africa?". In Southall, R. (ed.). *New South African Review Volume 1*. Johannesburg: Wits University Press.
183. Swilling, M. 2010. *Co-founder and resident of the Lynedoch EcoVillage; board member of the LDC*. [personal interview]. 29 June.
184. Taylor, A. 1978. "A Philosophical Frame of Reference for the Art Educator Turned Environmental Design Educator". *Art Education*. 31 (5): 9-13.
185. Teicher, M.H. 2003. "The Neurobiological Consequences of Early Stress and Childhood Maltreatment". *Neuroscience and Biobehavioural Reviews*. 27: 33-44.
186. Theron, F. & Saunders, J. 2009. "Scientific writing skills and social research methodology: an introduction of basic techniques." In Davids, I., Theron, F & Maphunye, K.J. (eds.). *Participatory Development in South Africa: a development management perspective*. 2nd edn. Pretoria: Van Schaik.
187. Titman, W. 1994. *Special places, special people: The hidden curriculum of schoolgrounds*. UK: World Wildlife Fund.
188. United Nations Convention on the Rights of the Child. 1989. [online]. Available: <<http://www2.ohchr.org/english/law/pdf/crc.pdf>> (22 September 2010)
189. United Nations Educational, Scientific and Cultural Organisation. 2010. *Education for Sustainable Development*. [online]. Available: <<http://www.unesco.org/en/esd/>> (19 October).
190. United Nations Environment Programme. 2007. *Global Environment Outlook GEO 4: Environment for Development*. Nairobi: United Nations Environment Programme.

191. United Nations Human Settlements Programme. 2003. *Challenge of the Slums*. London: Earthscan.
192. United Nations. 2005. *Millennium Ecosystem Assessment*. New York: United Nations.
193. United Nations. 2006. *State of the World's Cities 2006/7*. New York: United Nations.
194. United Nations. 2009. *Human Development Report*. New York: United Nations.
195. Vallabh, P. 2007. "A Perspective on Risk, Policy, Community-based Early Childhood Development and Education for Sustainable Development in South Africa" In Björneloom, I. & Nyberg, E. (eds). *Drivers and Barriers for Implementing Learning for Sustainable Development in Pre-School through Upper Secondary and Teacher Education*. France: UNESCO.
196. Van Breda, J. 2008. "Overcoming the disciplinary divide: towards the possibility of a transdisciplinary hermeunetics" In Burns, M. & Weaver, A. (eds.). *Exploring sustainability science: a southern African perspective*. Stellenbosch: African Sun Media. pp. 91.
197. Van Damme, W. 1996. *Beauty in Context: towards an anthropological approach to aesthetics*. The Netherlands: Brill.
198. Van der Merwe, H. 1996. "The Research Process: problem statement and research design". In Garbers, J.G. (ed.). *Effective research in the human sciences- research management for researchers, supervisors and master's and doctoral candidates*. Pretoria: Van Schaik.
199. Van der Ryn, S. & Cowan, S. 1996. *Ecological Design*. Washington DC: Island Press.
200. Van Niekerk, R. 2010. *Former principal of the Lynedoch Crèche, co-trainer of the accredited ECD training programme and resident of the Lynedoch EcoVillage; board member of the LDC*. [personal interview]. 1 August.
201. Van Wyk, S. 2010. *Teacher at the Oude Muragie Jubilee Preschool and student at the accredited ECD training programme of the Sustainability Institute*. [personal interview]. 14 April.
202. Viljoen, D.L., Gossage, P.J., Brooke, L., Adnams, C.M., Jones, J., Robinson, L.K., Hoyme, H.E., Snell, C., Khaole, N.C.O., Kodituwakku, P., Asante, O., Findlay, R., Quinton, B., Marias, A., Kalbeg, W.O. & May, P.A. 2005. "Fetal Alcohol Syndrome Epidemiology in a South African Community: A Second Study of a Very High Prevalence Area". *Journal of studies on alcohol and drugs*. 66 (5):593-604.
203. Wackernagle, M. & Rees, W. 1996. *Our Ecological Footprint*. British Columbia: New Society Publishers.
204. Walljasper, J. 2010. "Happy cities for the global South: interview with Enrique Pestalosa" in Yes! [online]. Available: <<http://www.yesmagazine.org/happiness/happy-cities-for-the-global-south-interview-with-enrique-penalosa>> (2 October 2010).

205. Weick, K.E. *Sensemaking in organisations*. Thousand Oaks: Sage Publications.
206. Weick, K.E., Sutcliffe, K.M & Obstfeld, D. 2005. "Organizing and the process of sense making". *Organization Science*. 16 (4): 409 – 421.
207. Wells, N. M. & Evans, G.W. 2003. "Nearby nature: A buffer of life stress among rural school children". *Environment and Behaviour*. 35 (3): 311 – 330.
208. Worby, M. 2010. *Sustainable and natural building & energy design consultant*. [telephonic interview]. 14 September.
209. World Wildlife Fund (WWF). 2008. Living Planet Report 2008. [Online] <http://www.panda.org/about_our_earth/all_publications/living_planet_report/> (1 October 2010).
210. Yachkaschi, S. 2008. *Towards the development of an appropriate organisational development approach for optimising the capacity building of community-based organisations (CBO's): A case study of 3 CBO's in the Western Cape*. Dissertation presented for the degree of Doctor of Philosophy (Development Management) at the University of Stellenbosch. Stellenbosch University: South Africa.
211. Yin, R.K. 2008. *Case Study Research: design and methods*. 4th ed. Thousand Oaks: Sage.
212. Young, M.E. & Mustard, J.F. 2007. *Early child development and impact on broader socio-economic development: case for Africa*. Washington, DC: World Bank.
213. Zandee, D.P. & Cooperrider, D.L. 2007. "Appreciable Worlds, Inspired Inquiry". In Reason, P. & Bradbury, H. (eds). *The Sage Handbook of Action Research: Participative Inquiry and Practice*. 2nd edn. London: SAGE Publications.