'Ilima', 'Izithebe' and the 'Green Revolution'

A complex agro-ecological approach to understanding agriculture in Pondoland

and what this means for sustainability through the creation of 'Living Landscapes'

by

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Abstract

This thesis uses local narratives to explore relationships between agrarian landscapes, agrarian land use practices and the traditional cultural perspectives of traditional amaMpondo farming communities living along Pondoland's Wild Coast, on the East Coast of South Africa.

This endeavour is based on theories that propose that human behaviour, including agrarian practice, is influenced by complex socio-cultural factors that shape cultural values, knowledge and world-views, and that are reflected in cultural narratives, and these influence the way different cultures relate to the surrounding environment. As a consequence of these cultural influences, different cultures use and shape the landscape in unique, culturally determined ways. Consequently, in human impacted landscapes attention needs to be paid to how cultural world-views, practices, customs and value systems influence the land use practices of the people inhabiting those landscapes.

Amongst traditional communities with a long history of habitation within particular landscapes, traditional land use practices and customs, including agrarian practices, need to be understood from the perspective of the opportunities and constraints that particular environments present.

Literature shows that a failure to understand relationships between culture and land use can led to the imposition of unsuitable development practices and policy on traditional cultures, and this can undermine cultural, agricultural and ecological diversity and lead to unsustainable models of development (Naveh, 1995; Antrop, 2005; Antrop, 2000; Capra, 2003; Capra, 1996; Nusser, 2001; Harding, S. 2006). Given the need to address development and agricultural practices that perpetuate unsustainable land use, an understanding of the nature of influencing relationships between landscape, land use and culture is particularly important

Despite the debilitating influences of a colonial history, many rural communities along the Pondoland Wild Coast still retain a strong sense of cultural identity that has deep roots in a traditional agrarian system, and this has given rise to a unique indigenous landscape. This study of traditional amaMpondo farming communities presents an opportunity to gain insights into how different cultural perspectives might shape and utilize the landscape and lead to alternative land use systems than the dominant industrial norm.

Abstrak

Hierdie tesis gebruik plaaslike narratiewe om die verhoudings tussen agrariese landskappe, landbou grondgebruik en die tradisionele kulturele perspektiewe van tradisionele amaMpondo boerdery

gemeenskappe wat langs die Pondolandse Wildekus, aan die ooskus van Suid-Afrika voorkom te verken.

Hierdie strewe is gebaseer op teorieë wat voorstel dat menslike gedrag, insluitende agrariese praktyk, beïnvloed word deur die komplekse sosio-kulturele faktore wat   kulturele waardes, kennis en wêreldbeskouings vorm, en wat weerspieël word in die kulturele verhale, wat dan weer invloed het op die wyse waarop die verskillende kulture verband hou met die omliggende omgewing. As gevolg van hierdie kulturele invloede, maak verskillende kulture in unieke, kultureel bepaalde wyse gebruik van die landskap. Gevolglik, in landskappe wat deur die mens beïnvloed word, moet aandag geskenk word aan hoe kulturele wêreldbeskouings, praktyke, gewoontes en die waarde stelsels die mense in hierdie provinsies se landgebruik be-invloed.

Tradisionele praktyke en kulture waaronder agrariese praktyke ingesluit is, moet in die tradisionele gemeenskappe wat 'n lang geskiedenis het van habitasie binne bepaalde landstreke, verstaan word vanuit die perspektief van geleenthede en beperkings wat hierdie besondere omgewings verteenwoordig.

Litteratuur toon dat die versuim om die verhoudings tussen kultuur en grondgebruik te verstaan, kan lei tot die oplegging van ongeskikte ontwikkelings praktyke en beleid op tradisionele kulture. Dit kan' n kultuur-, landbou-en ekologiese diversiteit ondermyn en lei tot onvolhoubare modelle van ontwikkeling (Naveh, 1995; Antrop, 2005; Antrop, 2000, Capra, 2003; Capra, 1996; Nusser, 2001; Harding, S. 2006). Om die behoefte te vul wat ontwikkeling en landbou-praktyke wat nie-volhoubare grondgebruik perpetueer, is 'n goeie begrip van die aard van die beïnvloedings verhoudings tussen landskap, grondgebruik en kultuur veral belangrik.

Ten spyte van die kreupelende invloed van 'n koloniale geskiedenis, het baie landelike gemeenskappe langs die Wildekus van Pondoland nog steeds' n sterk gevoel van kulturele identiteit wat diep wortels in 'n tradisionele agrariese stelsel het. Dit het aanleiding gegee tot' n unieke inheemse landskap. Hierdie studie van die tradisionele amaMpondo boerdery gemeenskappe bied 'n geleentheid aan om insig te verkry in hoe verskillende kulturele perspektiewe van die landskap kan vorm en gebruik maak en lei tot' n alternatiewe grondgebruik as die dominante industriële norm.

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List of Abbreviations

CI - Conservation International

FAO – United Nations Food and Agriculture Organisation

GDP - Gross Domestic Product

GIAHS - Globally Important Agricultural Heritage Systems

HEI   - High External Input

ICOMOS - International Council on Monuments and Sites

IMF -   International Monetary Fund

MEA   - Millennium Ecosystem Assessment

MSD -   Mainstream Sustainable Development

NGO -   Non-governmental Organisation

INR - Institute of Natural Resources

OED - Oxford English Dictionary

PCE - Pondoland Centre of Plant Endemism

PLAAS - Institute for Poverty, Land and Agrarian Studies

SAEO - South African Environment Outlook

SANBI - South African National Biodiversity Institute

SMME's - small and medium business enterprise initiatives

SWC - Sustaining the Wild Coast

THE - Total Human Eco-system

TOC - Theories of Complexity

UNESCO - United Nations Educational, Scientific and Cultural Organisation

USA - United States of America

WB - World Bank

WCED - World Commission on Environment and Development

WTO - World Trade Organisation

Notes on Thesis Layout

The thesis is set out in the following manner.

Chapter 1 provides an Introduction to the study. This consists of two sections.

Section 1 provides a theoretical background for the motivation of the study.

Section 2 outlines the intended purpose of the study.

Chapter 2 consists of a Literary Review. The Literary review provides a contextual background by discussing the theory that underpins the study, presenting a brief background to dominant modern agricultural trends and the implications of these for the development of a sustainable agriculture, and examining how different philosophical world views and value systems underpin development paradigms through their influence on human understanding and behaviour.

The Literary Review is set out in three sections.

Section 1 provides a theoretical background to understanding agrarian systems as complex socio-ecological systems, and the implications of this perspective.

Section 2 looks at current global trends and concerns in agriculture, and the implications of these for the development of a sustainable agriculture.

Section 3 explores how philosophy influences development paradigms through its influence on human understanding, perception, and value systems.

Chapter 3 focuses on the historical background to Pondoland as a case study, focusing on the way historical events have influenced amaMpondo culture and agrarian practice.

Chapter 4. In Chapter 4, Section 1 discusses the Methodology used in this research. Although this is an unusual placement for a thesis methodology, within this context I believe this placement provides most clarity for the empirical research section that comprises section 2 of Chapter 4.

Section 2 investigates individual case studies to explore the contemporary narratives, world views and agrarian practices of amaMpondo[1] people in the region who still follow a traditional way of life.

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[1] In Xhosa, prefixes are added to nouns to denote singular or plural. Mpondo is the name of the tribe. The prefix ama denotes the collective body of people of the tribe of Mpondo, hence amaMpondo. When I questioned a local man about spelling, he commented "The tribe has descended from a man by the name 'Mpondo' hence the name amaMpondo. So I think it should be amaMpondo". (Sinegugu Zukulu)

Chapter 5

Section 1 summarises key findings from the case studies.

Section 2 provides commentary and discussion on the findings, in relation to sustainability.

Chapter 6 provides a summing up and conclusion to the main points of the study, including a diagrammatic qualitative systems analysis of some of the key inter-relationships that occur between local culture, agrarian practice and local ecologies.

Diagrammatic outline of Thesis Layout
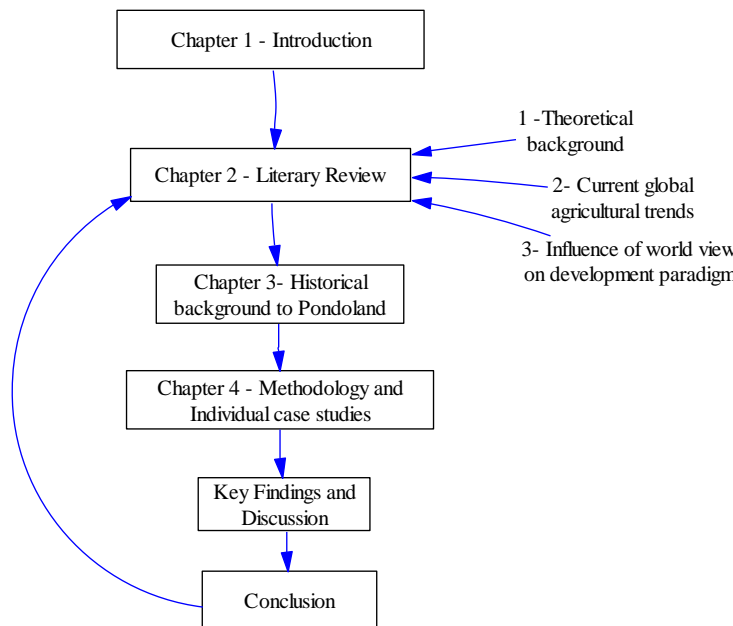
Photographic Material and Diagrams

In this thesis, I have made liberal use of photographs to provide photo-documentary evidence. My intention in doing this is three-fold.

First, the sensory, aesthetic quality of landscape lends itself to the use of photographs to help provide description and a 'sense of place' that verbal descriptions alone would be incapable of providing. The photographs thus form an essential component in the attempt to root this thesis within the context of a particular place and its relatedness a particular people.

Second, the photographs help to provide anthropological description to particular cultural and agrarian practices, so have an important educational value.

Third, I believe that if current developmental trends in the region continue to ignore traditional connections between indigenous socio-cultural factors and landscape use, then the traditional landscape and cultural practices that these photographs document will vanish. In this case, these photographs will provide an important historical record of what once was.

All photographs in the document, unless otherwise referenced, have been taken by me, Valerie Payn as part of this research project.

Documentary Presentation of Narratives

In the case study research section (Chapter 4, section 3) I have relied on extensive documentation of narratives that people have told to me in the course of my research. My intention in doing this is to present the views and perspectives of local people in as unadulterated a manner as possible, in keeping with a participatory and narrative approach. Although I recognise that this manner of presentation adds to the length of the thesis, I believe the importance of presenting direct narrative adds immensely to the understanding of local connection, context, local perspective and sense of place in relation to particular landscapes that I am trying to re-create, and that these benefits outweigh considerations of length.

CHAPTER ONE: INTRODUCTION AND MOTIVATION

 "Think about it for a second: what is the real source of our life? Of our food, our air, our water? Is it the economic system? Of course not: it is our landbase." (Jensen; 2006:127).

Figure 1. A traditional landscape scene along Pondoland's Wild Coast, showing a traditional dispersed spatial settlement of dwellings and fields interspersed with grazing commonage, and vernacular architecture.

1.1 Introduction

The primary focus of this thesis is to generate an increased understanding of how the perspectives and 'social reality' of amaMpondo farmers influence local agrarian practices, and how these relate to local land management strategies in reaction to a changing social, political and economic environment. My intention is not to provide quantitative proof or prediction, but to use systems analysis and the theoretical framework provided by Theories of Complexity (ToC) to open up avenues for further exploration and questioning, and so to create a greater understanding of local relationships and inter-connections that exist between a particular culture, their use of the landscape, and agricultural practices. The findings of this study suggest that a reductionist failure to take into account the complex relationships that exist in Pondoland between culture, agriculture and the natural environment have historically lead to the imposition of unsuitable development paradigms and processes on the amaMpondo people that have undermined local social, agricultural and ecological sustainability. I hope that by generating an increased understanding of the nature of the complex relationships between culture, agriculture and the environment along the Pondoland Wild Coast, this thesis will help promote the generation of more suitable and sustainable development solutions in Pondoland's Wild Coast area.

The concept of 'Sustainable Development', given prominence by the 1987 publication of the Brundtland Report, also known as 'Our Common Future' (World Commission on Environment and Development (WCED)), has brought global recognition to the implications of ecologically unsustainable human development. Although the issues raised by 'Our Common Future' were not new, with antecedents including the 1972 'Club of Rome' report *'The Limits to Growth'* and the 1972 Stockholm Conference on the Human Environment, the Brundtland Report was notable for highlighting connections between environmental degradation, poverty, and current pathways of economic development, and stressing that solutions require joint international effort (Adams, 2009).

The Brundtland Report's (1987) definition of 'Sustainable Development' as "development which meets the needs of the present without compromising the ability of future generations to meet their own needs" outlines three key inter-connected prerequisites for sustainability. These are the need to promote human-wellbeing, conservation of Earth's ecological resources, and inter-generational equity (Bartelmus, 1994; Brown et al, 2001; Maclaren, 2003; Wackenagel and Rees, 1996). However, within these broad parameters of agreement about the intentions of sustainable development, debates rage about the meaning embodied in the details, and the means through which sustainability can be achieved. Critics have argued that the Brundtland definition's broadness, and the abstract nature of words such as 'development' and 'sustainable' makes the definition's meaning context related and dependent upon the world view of the individual   (Bartelmus, 1994: Dresner, 2002.) As a consequence anyone can 'claim almost anything as part of 'sustainable development' (Dresner, 2002:68). This means concepts such as 'sustainability' and 'development' contain value and ethical judgements that are often culturally determined and politically influenced (see also Chapter 2, Section 3).

1.2. The Influence of Development Paradigms on Sustainable Development

Adams (2009) argues that currently, development debates around sustainability may be broadly defined as those that perpetuate mainstream views characteristic of modern industrial paradigms of development, and radical or transformative 'alternative' views that call for a fundamental restructuring of the dominant perspectives and value systems that currently define the social, political and economic structure of mainstream society (see also O'Riordan; 1999). Mainstream views stress the need for technological improvements and improved efficiencies of resource use within the current industrial development paradigm (Adams, 2009). In contrast, 'alternative' views question whether mainstream society has the intellectual and moral capacity and broad holistic vision that is required to deliver sustainable solutions (Adams, 2009, McCullum, 2005; Macy and Young Brown, 1998; Capra,1983; Morin,1999; Mies and Shiva, V. 1993)

Critics of the mainstream development agenda argue that the dominant reductionist Western viewpoint which underlies modern industrial society, while it is useful for understanding isolated particulars, contributes towards global problems by promoting a fragmented, simplistic, mono-visionary view of the world that is anthropocentric, materialist, and deterministic and so fails to see the inter-related nature of many issues (Adams, 2009, McCullum, 2005; Macy and Young Brown, 1998; Capra,1983; Mebratu,1998; Morin,1999; Mies and Shiva, 1993). The consequence of reductionism has been a worldview that emphasises a divide between the Human world and Nature (McCullum, 2005; Macy and Young Brown, 1998; Capra,1983; Harding, 2006), that has tended to ignore that ecological and social systems are dynamic inter-dependent systems and so fails to understand the inter-connected nature of social interactions with natural ecologies (Capra,1983; Harding, 2006), and that narrowly sees 'development' in terms of westernization and industrialisation to drive economic growth (Norberg-Hodge, 1991, Adams, 2009: O;Riordan, 1999; Naess, 1999; Cruz et al, 2009). From this perspective, Earth is viewed primarily as a source of unrelated resources to be exploited in the service of humanity, rather than as a complex, inter-connected web of self-regulating, life supporting systems of which humans are an integral part, as outlined by James Lovelock's concept of Gaia[2].

The schismatic influence of reductionism has led to conservation priorities that have traditionally focused on the establishment of wilderness areas where human activities are highly restricted or excluded (Colchester, 2004), while a narrow industrial agricultural preoccupation with yield to drive capital expansion (Clow, 2001; quoted in McClaughlin and Clow, 2003) has seen agricultural development agendas overlook the broader impacts of agricultural development, such as ecological impacts, local suitability and socio-cultural impacts (Perfecto et al, 2009). This schismatic approach has also meant that conservation agenda's have systematically ignored how the composition, or matrix, of different agricultural systems affects natural biodiversity (Perfecto et al, 2009). Consequently, both conservation and industrial agricultural development agenda's have tended to ignore how the socio-cultural frameworks of indigenous societies inhabiting traditional landscapes relate to local land use practices and biodiversity distributions. In many instance this has lead to the imposition of culturally and ecologically unsuitable developments on indigenous people and the landscapes they inhabit (Adams, 2009; Colchester, 2004; Antrop, 2005).

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[2] James Lovelock's Gaia theory argues that Earth is a complex system in which myriad inter- relationships between the physical components of Earth (such as chemical, mineral and atmospheric compositions) and biological systems, are regulated by multiple feedbacks between the physical and the biological, and these create the self –regulating, self organising planetary conditions that enable life to flourish on Earth (Capra, 2003; Harding, 2006).
The systemic view of life embodied by Gaia theory implies that changes at any level in biological systems has the potential capacity to induce physical landscape changes at numerous levels, and vice- versa.

The influence of reductionist perspectives is evident in apparent conflicts of interest between recent calls by global conservation organisations to increase land areas under conservation and reduce natural habitat loss and land use change in order to curtail rapid biodiversity loss[3], while international agricultural organisations such as FAO, stressing the need to feed rapidly increasing global populations, have simultaneously called for increases in agricultural production, including increases in cultivated land areas of between 71Mha to 300mHa (Bringezu et. al. 2010). Both conservation and agricultural agendas have alarmed human rights groups, who warn that expansions of agro-industry, agriculture and conservation sectors threaten the human rights of indigenous people and traditional communities already residing on the land (Pushback, 2011). The contradictions inherent in the various agenda's of conservation groups, FAO and Indigenous rights groups highlight that an important challenge in achieving sustainable land use involves finding solutions in which both global food security and conservation agenda's might be met, while recognising the interests and cultural frameworks of communities already residing on the land.

In this endeavour the, concept of 'Living Landscapes' seems to be a useful framework from which to investigate relationships between cultural and ecological systems, and how these shape particular landscape use. The ideal of 'Living Landscapes' embraces both cultural and ecological diversity. 'Living Landscapes' occur where human cultural adaptations to particular natural environments create landscapes with unique characteristics where the well-being of both human and natural environments are maintained over long periods of time (refer to section 2.1/11 for more detail).

1.3 Agriculture and sustainability

In the search for sustainable solutions, agriculture has been cited as a source of unsustainable practices (IAASTD. 2009; Geo 4, 2007; UNEP, 2007; MEA; 2005; South African Environment Outlook (SAEO), 2006), as well as a source of sustainable practices and a means of mitigating many of the unsavoury effects of unsustainable pathways of development (ITC, 2007; Pretty,1995; Pimbert, 1999; Pagiola et al, 1998; UNCTAD, 2007). These apparently contradictory views embody the recognition that different systems of agriculture have remarkably different ecological impacts (Perfecto, Vandermeer and Wright, 2009; Berglund, 2008; Pagiola, 1998; Pretty, 1995; Altieri, 2000 ITC, 2007; Smithers, 2002). This evidence highlights that an important consideration for the creation of a sustainable agriculture is not just whether land has been converted from its natural state to agricultural use, but what form that conversion takes.

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[3] The 2010 Convention of Biological Diversity has called for the conservation of at least 10% of each of the world's ecological regions, and a significant reduction in land use change and habitat conversion (Convention on Biological Diversity 2010 targets. http://www.cbd.int/2010-target/goals-targets.shtml).

Pagiola et al (1998) point out that in Sumatra, traditional agro-forestry systems contain much higher levels of forest species diversity than other agricultural systems in the vicinity. In Japan and Sweden, the traditional agrarian management of Satoyama woodlands and 'outland woodlands' respectively, create landscape mosaics with diverse eco-systems that help maintain high levels of natural diversity (Berglund, 2008; also see Fukamachi et al. 2001, Kobori and Primach 2003, Kuramoto and Sonoda 2003, Washitani 2003; Ekstam et al. 1988, Lindbladh 1999, Nilsson 1997, Cousin and Eriksson, 2002 as quoted by Bergland). Perfecto et al (2009) argue that the composition of different agricultural systems have significant implications for the distribution and conservation of natural biodiversity.

Agricultural systems that mimic natural ecological processes and that involve cyclical patterns of resource use are considered to be more sustainable, more resource efficient and less environmentally hazardous than linear input -output systems and systems that involve high levels of chemical dependency and monoculture 'factory farm' processes, which are often referred to as High External Input (HEI) agricultural systems (Mollison, 1991; IBEC, 2005; Van der Ryn and Cowan, 1996; Brown, 2008; Pretty, 2006).

The fact that agrarian landscapes constitute such a large area of landmass[4], and that agriculture is critical to human well-being, means that a sustainable agriculture can play a key role generating sustainable solutions provided that the differing ecological and cultural impacts of different agricultural systems are recognised, and choices are made to promote ecologically compatible agrarian systems.

1.4 Agriculture as a Socio-ecological Construct

A look at definitions of the word 'agriculture' shows numerous variations. The OED defines 'agriculture' as "the science or practice of cultivating the soil and rearing animals" and describes the word as having two roots; 'agri', from 'ager', meaning field, and 'culture' (OED. 7th ed. Sykes). The Free Dictionary (2012) defines agriculture as "The science, art, and business of cultivating soil, producing crops, and raising livestock; farming" (http://legal-dictionary.thefreedictionary.com/Agriculture. 5/2/2012). The Merriam Webster Dictionary (2010) describes agriculture as "the science, art, or practice of cultivating the soil, producing crops, and raising livestock and in varying degrees the preparation and marketing of the resulting products". (http://www.merriam-webster.com/dictionary/agriculture, 4/11/2010). These definitions all emphasize

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[4] Contradictory figures make it difficult to determine the extent of land under agricultural use globally. Geo4 says about 26% of earths land surface (3.3 billion hectares) is used for agriculture, and the MEA maintains about 38% of Earth's land area is under agricultural use. The amount of prime arable agricultural land available globally is estimated to just over 10% of Earth's ice-free surface. Of this 1.5Bha (just over half) is cultivated as cropland, while 1.7Bha is under pasture, forest or woodland cultivation (Scherr 1999 quoted in Bringezu et al 2010).

agriculture as an enterprise involving particular knowledge, skill, and effort to raise crops or livestock. Other definitions stress the importance of agriculture as an activity geared towards meeting human needs and requirements. These include Abellanosa and Pava's *"Agriculture is the growing of both plants and animals for human needs"* (Abellanosa and Pava, 1987: 238), Rubenstein's description of agriculture as *"the deliberate effort to modify a portion of Earth's surface through the cultivation of crops and the raising of livestock for sustenance or economic gain"* (Rubenstein, 2003: 496) and Domat's *"Agriculture is the art of cultivating the earth in order to obtain from it the diverse things it can produce; and particularly what is useful to man, as grain, fruit's, cotton, flax, and other things."* (Domat, Dr. Pub. Quoted in Crop Farming Review; 2012). Crop Farming Review describes agriculture as **"**the art and science of growing plants and the raising of animals for food, other human needs, or economic gain" (http://www.cropsreview.com/what-is-agriculture.html. 20/01/2012).

 Bareja (2011) argues that from studying various definitions of agriculture one can conclude that agriculture is a deliberate human activity or practice, it is based on a systemized body of knowledge and skill, and it involves the cultivation of soil or raising animals in order to meet various human needs. Bareja argues that the purpose of agriculture is an important component in clarifying what constitutes agriculture (quoted in Crop Farming Review; 2012). That agriculture is a purposeful human activity, the importance of purpose in clarifying agricultural activities, and the requirement of a systemic body of skill and knowledge suggests a strong cultural component to agriculture. Naveh (1995) points out that the word 'culture' has its roots in the Latin colere, meaning "to cultivate, to care for, and to preserve". 'Culture', according to the OED (OED. 7th ed. Sykes) denotes "tillage of soil, rearing, production...intellectual development; particular form, stage or type of intellectual development or civilization". From these perspectives, agriculture may be described as the caring practice of tilling the field or raising animals, informed by the particular knowledge, intellectual development and purpose of a particular civilization, culture or individual, and giving rise to particular products and achievements.

The relationship between culture and agriculture means that an understanding of agricultural systems requires insight into the socio-cultural context, or 'social reality' in which agricultural practices evolve and occur and which influence human land use (Antrop, 2000; Egoz et al, 2001; Naveh, 1995). 'Social reality' refers to the total socio-cultural parameters within which individuals function, and includes knowledge, opportunities, available technology, value systems, perceptions and skills, and economic systems (also refer 2.1/5). Human activity in agriculture is aimed towards a particular goal that involves transforming an ecological system from a natural state to a form suited to human ambitions and achievements.

This complex understanding of agriculture means that agrarian landscapes need to be understood in terms of the complex, evolving inter-relationships that occur between culture, ecology and agriculture (see Box 1).

Naveh (1995) and Antrop (2005) argue that in all human impacted landscapes, such as agrarian landscapes, the unique inter-connections between socio-cultural factors, agrarian practice and ecology give rise to landscapes with unique characteristics. If sustainability requires that humans interact with their immediate and total environment in less ecologically destructive ways, then this means developing an understanding of why different human cultures or societies might choose certain practices, technologies and land use strategies over others, what sort of social systems give rise to sustainable land use practices, what socio-cultural factors drive unsustainable land use and agrarian practices, and how social value systems and institutions might influence individual choices over land use practices (Naveh,1995; Antrop, 2005).

Box 1. Diagram illustrating the inter-dependent relationship between cultural, agricultural and ecological systems.

Arrows indicate two way causal relationships, or feedback loops, between all the elements, where changes to culture can affect changes to both agriculture and ecology, changes to ecology could influence changes to culture and agriculture, and changes to agriculture could have cultural and ecological implications.
The unique combination of these elements creates particular agricultural landscapes.

The inter-connected nature of these systems means change within any one of these elements has the ability to set off a dynamic chain of events in all the connected systems, which in turn can reverberate back to instigate more change in the original system, in a process of co-evolution. (See Appendix for more details on understanding causal loop diagrams)

1.5 Historical and Recent Trends

Historically, a global diversity of cultures and ecologies gave rise to a world tapestry of diverse, culturally and ecologically specific 'Agricultures' whose formation and practice was directly related to the 'social reality' of the societies that developed them and the ecologies in which they were shaped. The value of this agrarian diversity has been recognized by The International Council on Monuments and Sites (ICOMOS), and by the United Nations Educational, Scientific and Cultural Organisation (UNESCO), who describe traditional agrarian systems as being multidimensional representations of cultural heritage that result from particular combinations of various 'tangible and intangible, cultural and natural properties' (Yáñez. ICOMOS. 2010: 2). Elements include vernacular infrastructure and architecture, locally bred agrarian crops and livestock and the specific techniques, knowledge and skills related to the cultivation or care of these, and agrarian related cultural activities such as rituals, festivals and spiritual beliefs.

The importance of understanding inter-relationships between the cultural dimensions and ecological systems that shape agrarian landscapes is acknowledged in FAO's (2008) recognition of the importance of maintaining Globally Important Agricultural Heritage Systems (GIAHS).

GIAHS are agroecological systems where the co-evolution of particular cultures with the natural environment over time has given rise to unique and localized management techniques that foster unique agrarian landscapes with a rich mix of agricultural and natural diversity (FAO, 2008).

> *"*Worldwide, specific agricultural systems and landscapes have been created, shaped and maintained by generations of farmers and herders based on diverse natural resources, using locally adapted management practices. Building on local knowledge and experience, these ingenious agricultural systems reflect the evolution of humankind, the diversity of its knowledge, and its profound relationship with nature. These indigenous and traditional agricultural systems (henceforth referred to as Globally Important Agricultural Heritage Systems "GIAHS" systems have resulted not only in outstanding landscapes (some are recognised as World Heritage Sites), maintenance and adaptation of globally significant agricultural biodiversity, indigenous knowledge systems and resilient ecosystems, but, above all, in the sustained provision of multiple goods and services, food and livelihood security and a certain quality of life that keeps a close link with its natural environment".(FAO ibid ;3).

Driving this recognition are concerns that, over the last fifty years, modern trends in agricultural development have erased much of the traditional diversity of global agricultural systems in favour of a uniform 'one size fits all' global agricultural 'monoculture'; that these trends are related to particular dominant but narrow views of development and progress that characterize contemporary industrial society; and that these trends are responsible for much of the ecological degradation for which agriculture has been accused (Pimbert, 1999; Alterei, Norberg- Hodge, 2000).

Indeed, there is growing recognition that in many instances loss of biodiversity, cultural diversity and agricultural diversity are inter-connected to changes to land use and land management strategies as a consequence of political, economic and technological change brought about by industrialization (State of the World, 2011; IAASTD, 2009). Highlighting these inter-connections, Mabey (1999) has observed that widespread changes in the British countryside are a consequence of inter-related ecological, social and agrarian change as a consequence of an industrial world view that has influenced human relationships with nature.

> "The greatest shock in the present transformation is that it has come about not so much from an invasion by urban sprawl or industrial development, but from insidious and often unobserved changes in the internal workings of the countryside itself… what we had regarded as natural landscape was a much more complex product of growth and husbandry…conservation is concerned ultimately with relationships, between man and nature, and man and man"
> (Mabey, R.; 1999: 57).

Mabey's observation highlight that understanding landscape change entails understanding the relationships between socio-cultural change and land use changes, and the internal and external drivers that bring about that change. The recognition of relationships between culture and landscape use, and the growing realization that a loss of cultural diversity is inter-related to the loss of agrarian and biological diversity, has generated renewed interest in traditional and indigenous ways of life as examples of alternatives in practice, philosophy and knowledge to those of the dominant model of western industrialization (Norberg Hodge; 1991; 2000; Macy and Young-Brown; 1998).

It is within this framework that I feel a study of local perspective and agrarian practices along Pondoland's Wild Coast is highly relevant.

1.6 The Relevance of Pondoland as a Case Study

Pondoland's Wild Coast is situated in Eastern Cape Province's Transkei region.
A quick Google search reveals that the Transkei region of Eastern Cape is commonly dubbed 'the poorest region in South Africa' (www.eastlondon.org.za; www.ecparks.co.za; www.environment.gov.za/soer/ecape/summary.htm (10/8/2010).

Historically, the traditional inhabitants of the Pondoland region, the amaMpondo, have been described as having had an atypical colonial experience as they were able to largely avoid conflict with colonial powers and were able to maintain their political, economic and social independence for much longer than other Bantu people in the region. This ability is largely attributed to amaMpondo diplomacy, and economic self-sufficiency as a consequence of their extensive agrarian practices (Beinart; 1982). This independent self-sufficiency and history of resistance has meant that there is still a strong sense of cultural identity amongst many rural amaMpondo communities who still follow traditional agrarian based lifestyles, despite a long colonial and developmental agenda that has been aimed at 'modernising' traditional agricultural practices in order to stimulate local economic development. At best, many of these heavily state sponsored development attempts have only been partially successful

and half-heartedly supported by local populations. At worst, they have ended in social, economic and environmental failure (Manona, 2005; McAllister, 1992).

Simultaneously, concerns about the state of the local environment have seen many government conservation interventions in local resource use.

In many instances, both agricultural and conservation planning attempts have met with intense local resistance. This history of failure and resistance suggests that these projects have not succeeded in meeting the needs, aspirations or support of local populations.

Recent development initiatives proposed for the area include industrial agricultural development schemes, plantation forestry, ecotourism, proposed open cast dune mining along the coastal dune corridor, the creation of a Pondoland Park nature reserve and the construction of a national highway through the PCE (www.dti.gov.za ; Eastern Cape Development Corporation, www.ecdc.co.za). Although the mining licence granted to an Australian based mining company with interests in mining the region has recently been revoked by the Department of Mineral Affairs, this does not exclude the possibility of new mining applications in the area. Certain areas of Pondoland, including the Wild Coast, are recognised as important components in the conservation of the Maputaland-Pondoland-Albany Biodiversity Hotspot. An initiative sponsored by Conservation International (CI) Southern African Hotspots Programme and the South African National Biodiversity Institute (SANBI) have earmarked the 'Pondoland North Corridor' as a critical area for conservation (Critical Ecosystem Partnership Fund, 2010). The coastal corridor of Pondoland, colloquially known as the Wild Coast, is internationally recognised an important Centre of Plant Endemism[5], the Pondoland Centre of Plant Endemism (PCE). Highlighting the conflicts of interest often characteristic of many of the proposed developments in the region, Guyot has described the Wild Coast area of Pondoland as an 'Eco-frontier', that is a place of strategic importance characterized by conflicting agenda's over rich biodiversity, the use of a wealth of globally scarce natural resources and unique local knowledge (Guyot;2008).

Despite the many developments proposed for the Pondoland region, including agricultural developments, it has been acknowledged that in South Africa, agrarian interventions occur within "poorly understood social, economic and political contexts, the realities of which deeply influence the outcomes.... interventions are often based on simplistic understandings of social reality....if appropriate understandings of complex realities can directly inform policy making and implementation, these are more likely to be effective." (PLAAS; 2009).

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[5] Centres of Plant Endemism are recognised as areas that contain unusually high concentrations of endemic plant species. Currently there are 235 recognised Centres of Plant Endemism globally. In the PCE, more than 2235 different plant species have been recorded to date. 196 of these plants are endemic to the PCE (De Villiers and Costello; 2006)

Through involvement with the Non -Governmental Organisation (NGO), Sustaining the Wild Coast (SWC) (www.swc.org.za) I have, over six years, engaged with many traditional rural communities residing along Pondoland's Wild Coast. My experiences with these communities have led me to realize that the voices and aspirations of local people who inhabit the landscape of Pondoland are often most conspicuous by their absence in many of the developments planned for the region. This insight has led me to believe that the failure to take into account local perspectives and ambitions, and a tendency to disregard local paradigms and to impose perspectives that are foreign to local world-views and ambitions, are important factors in developmental failure in the region.

This study hopes, then, to generate a greater understanding of nature of relationships between socio-cultural factors, agrarian practice and landscape use in Pondoland, focusing particularly on rural communities still following traditional ways of life. Through this means I hope to generate an improved understanding of the way local perspectives and world views influence land use practices in Pondoland.
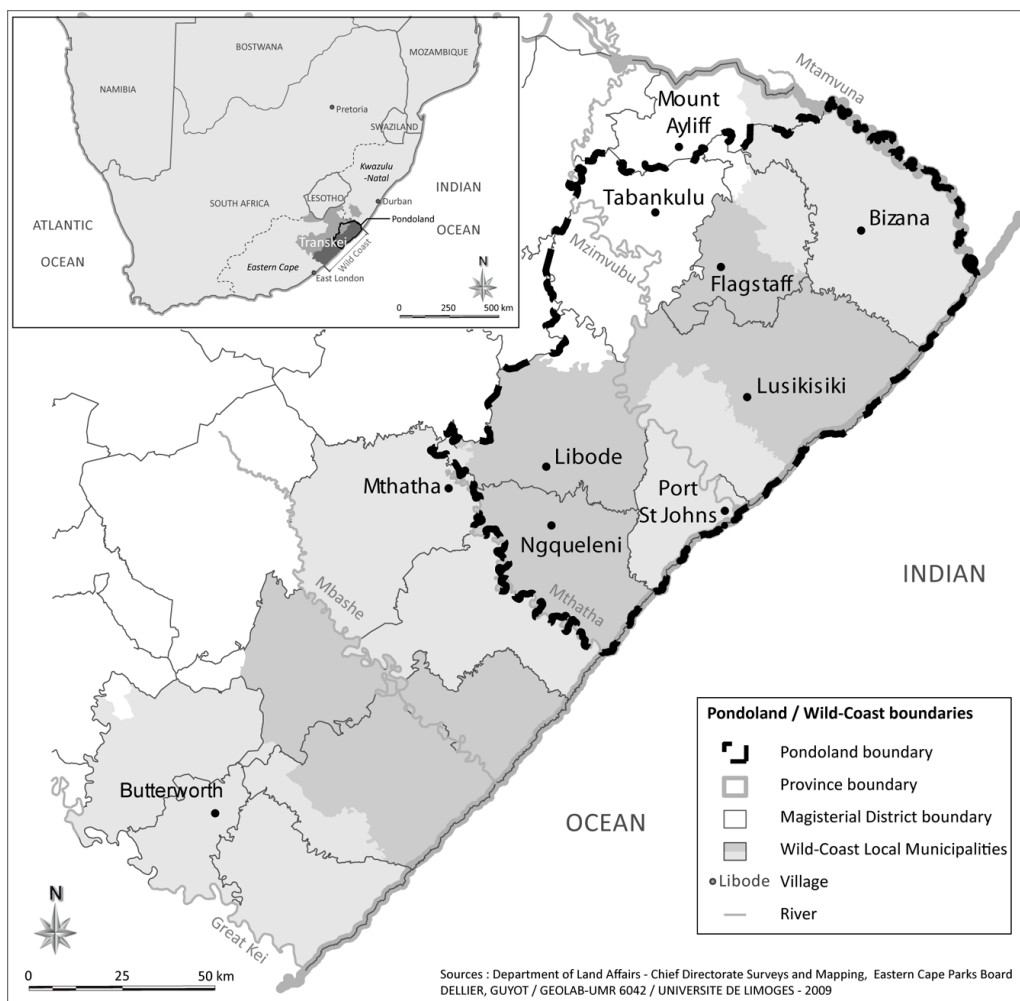
Figure 2. Pondoland boundaries (Dellier, Guyot.2009)

Outline of Research Objectives

1.7 Research objectives

The key objective of this research is to establish the nature of the relationships between agrarian land use practices and the socio-cultural world views that inform amaMpondo culture, and how these shape local land use practices.

Through this research I hope to determine:-

- The relationship between agricultural practices and socio-cultural factors.
- What changes in socio-cultural changes have occurred through different generations, and the impacts these changes have had on local agricultural practices.
- Whether different generations have different perceptions about land and resource use that affect their land management strategies?
- What implications these perceptions and changing value systems hold for creating or perpetuating sustainable landscape systems.

As the intention of this thesis is to develop an understanding of the contextual relationship between people and the landscape they inhabit, based on local perspectives, I will address these questions by using a narrative approach that allows the inhabitants of the landscape to recount their own experiences, perspectives and beliefs about land use, and what inter-generational changes they have noticed in the culture and the landscape. These narratives will be supplemented with my own field observations, with photo-documentary evidence (refer to Chapter 4, Section 2) and in the case of Ntafufu and Mthambala, with an aerial mapping exercise of land cover change that has occurred over time, sponsored by the Institute of Natural Resources, University of Kwazulu-Natal (Refer Appendix). I will supplement this with a qualitative systemic analysis that uses VENSIM to outline key influencing inter-relationships between local culture, land use and agrarian practice. VENSIM is a computer programme that can be used for qualitative (descriptive) or quantitative (mathematical) systemic analysis of complex systems. For this thesis I will use it to facilitate a descriptive (qualitative) understanding of the nature of feedback loops in Pondoland's agricultural systems, as uncovered in the process of this research.

1.8 What original contribution will the research make to existing knowledge on the subject?

For the past six years, I have been involved in a small not- for- profit Non-Governmental Organisation (NGO), Sustaining the Wild Coast (SWC), that has worked extensively with traditional rural amaMpondo communities along Pondoland's Wild Coast to promote community livelihoods

programmes in keeping with traditional lifestyles, and to promote local empowerment using participatory methods of engagement. My experience with SWC has led me to believe that, although numerous development projects have been proposed for Pondoland, many of these have been planned with scant participatory input from the local people they are supposedly designed to benefit, and show little understanding of the relationships between local ways of life, natural resource use and agrarian production. Many of these development proposals seem to have been driven by assumptions and ideology or the interests of outside agendas, rather than documented evidence and real understanding of the needs and aspirations of traditional Wild Coast communities.

By creating a greater understanding of the relationships between amaMpondo people, the landscape they inhabit and local agrarian practices, I hope this thesis can contribute towards developments that are more grounded in local perspectives and needs. In addition, given the diversity of cultures within South Africa, understanding the inter-relationships between agricultural production and socio-cultural value and knowledge systems seems to be an important factor in the creation of a sustainable agricultural sector.

1.9 To whom is the research important, namely who are the benefactors and/or audience.

This research would be relevant to agricultural policy makers, and agricultural organizations such as farmers unions, co-operatives and farmers association's with an interest in alternative and traditional systems of agriculture. It would be useful to NGO's, environmental organizations and social organization hoping to facilitate eco-friendly and socially equitable systems of agriculture and land conservation. It would also be helpful for those wishing to understand how different cultural perspectives might lead towards culturally diverse systems of agriculture, particularly in relation to the way of life of indigenous people. The study would also be of interest to ecologists and other disciplines wishing to gain greater insight into the nature of influencing relationships between culture and land use. Such understandings might contribute towards the policy promotion of more diverse, culturally based systems of agriculture and land conservation and management than is currently the case.

1.10 Limitations and assumptions of the study

In any systems analysis, scale can be problematic. Where does one draw the boundaries of the study when one is looking at causative influences? The nature of systems based analysis, and the complexity of living systems makes it difficult to make predictive conclusions. Emergent properties and unexpected feedback loops on a multitude of levels create unpredictability. Nonetheless, systems analyses can be useful to gain an understanding of connections and inter-relationships within a particular system, as well as to draw comparative analogies. The qualitative nature of the study and constraints of the thesis mean that this study will only be representative of a small sample of farmers

and agricultural communities. I therefore do not claim that the case studies researched here will provide generalized answers that can be extrapolated to the whole of Pondoland or Transkei. Rather, my aim is to provide a contextual understanding of the relationship between particular localized uses of landscape and the cultural perspectives of the people inhabiting that landscape. Specifically, I have focused my attention on farmers and rural communities along Pondoland's Wild Coast who still practice traditional methods of agriculture.

From a systems perspective, a comprehensive systems assessment of the sustainability of various agricultural systems should also include an assessment of the ecological consequences of various farming methods. However, the limitations of this thesis prohibit me from undertaking such an investigation. Although I realise that this study is limited in its extent, I hope it will raise questions that will be useful for informing further research in the region.

1.11 Ethical implications of the research

There were no harmful impacts on the subjects of the study. Anonymity was ensured to all participants who requested it. Research subjects were enrolled on a voluntary basis and were given a brief about the intentions and processes of the research before participation. A report back on the findings of the research has been offered to all participants to ensure transparency.

Figure 3 Vernacular architecture provides a unique aesthetic element to the Pondoland landscape. Clusters of dwellings and rondavels have an association with traditional spiritual beliefs, rites, family customs and changing 'tastes' (refer Chapters 4/ 5)

CHAPTER TWO: LITERARY REVIEW

Figure 4. In Pondoland spans of cattle are commonly used for draught. All activities related to cattle are considered men's responsibility. Besides having practical value, cattle are connected to amaMpondo ritual, spiritual belief, and customs.

2.1 Purpose and Outline of Literary Review

The review is divided into three sections, namely a Theoretical Background to Understanding Agrarian Landscapes as Complex Systems, Current Trends in Agriculture, and Philosophical Background underpinning Human Agency

Chapter 2. Section 1: Theoretical Background to Understanding Agrarian Landscapes as Complex Systems

2.1/1 Agroecology

According to Altieri (1989), agroecology involves understanding the complex co-evolutionary relationships that exist between ecology and society in any agrarian system. An agroecological approach to agriculture requires understanding that all elements in agrarian landscapes are parts of a single interactive system in which change (or co- evolution) is a collaborative, communal affair, with all parts of the system continuously responding to changes in other parts of the system. This requires

understanding the inter-relatedness of all the components of agrarian systems, and how these influence each other. From this perspective, agrarian landscapes cannot be understood through study of the separate components of the farmed landscape, but only through transdisciplinary study that takes into account the interactions between all the elements of the landscape, and the emergent consequences of those interactions.

Agroecology aims to generate the sort of understanding that promotes agrarian practices that are culturally and ecologically sensitive and locally appropriate, and that result in the empowerment of local communities, poverty alleviation, food security and self-reliance, sustainable ecological management and the development of suitable supportive policies (Altieri, 1989; Altieri et al, 2000; Pretty,2006; Pimbert, 2008; Magdoff, 2007). Given Agroecology's requirements for a complex understanding of agrarian systems, in the following section I will exam the implications of Theories of Complexity (TOC) for understanding agrarian systems.

2.1/2 Characteristics of Complex Systems

 Theories of Complexity (TOC) are built upon a number of basic premises that describe the nature and functioning of complex systems. The foundations of complexity thinking lie in recognising that no entity exists in complete isolation, but that all entities are part of a broader environment[6]. Conversely, that any particular environment is composed of a number of different interacting entities, each with their own structure and behaviour, whose collective behaviour gives rise to certain properties. This means that system characteristics cannot be explained in terms of the properties of individual entities, but only in terms of the interactions that occur between all entities in the systems and that give rise to particular behaviour or properties that give a system defining and identifiable characteristics (Capra, 2003; Harding, 2006; Cilliers, 2000. Clayton and Radcliffe, 1996; Meadows, 2008)

The defining characteristics of complex systems include:-

- A stable identity that is constant enough to become an indentifying characteristic of the system. This allows a system to respond to fluctuating changes in the environment without losing its identity (Capra, 2003; Cilliers, 2000). While 'Identity' is important as a source of stability, too inflexible an identity can prevent adaptation if it prevents suitable adaptation to changing circumstances (Cilliers, draft).

- Numerous linear and non-linear interconnections, or feedback loops, between all the elements in a system. These mean that change in one part of a system can have implications for all the other parts of a system (Morin, 1992; Capra, 2003; Cilliers, 2000).

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[6] In this context, I am using the term environment in its broadest and most abstract sense, in the OED description of 'surroundings', 'condition', or 'circumstances'. That is, an environment would be the particular conditions or circumstances surrounding any particular entity (OED 7th ed: 323).

- Intense interconnectivity between the elements of a system means that systems exist in a state of dynamic[7] equilibrium, constantly adjusting and changing both to internal change, and change to the surrounding environment. This dynamic nature means that change to any element in a system can give rise to the emergence of new behaviours or qualities in the system that can redefine the identity of the system. The dynamic nature of systems means they are paradoxically both stable and in a state of constant flux or adjustment to conditions in a changing environment (Meadows, 2008; Harding, 2006).

  Intense interconnections and relationships between all the elements in a system mean that single events cannot be seen as causative factors. As it is impossible to take into account all possible influences, prediction becomes precarious, and uncertainty becomes an inherent part of complex systems (Cilliers, 2000).

  "In order to model a system precisely…we will have to model life, the universe and everything" writes Cilliers (Cilliers, 2000: 28).

- In order to maintain a sense of identity and stability within a constantly changing environment, complex systems require 'self- knowledge'. That is the ability to discern how change will affect the system and to generate suitable adaptive responses that ensure system continuity. The way a system reacts to change is a consequence of the structure of the system, and a system's ability to determine how change will affect it. These in turn depend upon the system's history (the preceding events which have led the system to its current state), the system's memory or 'cognition' (the ability to distinguish change that is significant to the system from change in the surrounding environment that is irrelevant to the systems self-maintenance) and the role of time. Time enables the systems 'memory' to filter short lived change from more significant, long lasting changes to which the system must adjust if it is to survive (Cilliers, 2000; Meadows, 2008).

Allen et al (2010) outlines three levels, or frameworks, that can instigate change in complex systems. These are:-

- Change to external factors, such as the environment in which an entity exists,
- Change to the spatial relationship between various elements in a system, and
- Change to the internal characteristics of an entity or entities within a system (Allen, ibid: 46).

As all elements in a system are bound by relationships and interaction, change at any levels has the potential to affect all other levels in an "irreversible cascade... that makes everything essentially irreversible" (Allen et al; 2010:46). Internal change to an entity can trigger change to the interactions between entities, while change in the relationship between entities, such as spatial or external change,

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[7] "Dynamic – energetic; potent; active; affecting function; energising or motive force" (OED, 7th ed.:301).

can trigger internal change. This means that, as individual entities in a system evolve as part of a system, and are inter-dependent with the system, change occurs as a process of systemic co-evolution between all the elements of a system. Understanding change therefore requires understanding the relationships between internal change, spatial change and external change over time (Allen, 2010).

2.1/3 The Problem of Framing

The intense interaction between entities in a system, and the emergence of new behaviour and properties as a consequence of this interaction, makes it difficult to draw strict distinctions between individual entities (or parts) that comprise the system, and the whole system; it is "as impossible to know the parts without knowing the whole as to know the whole without knowing the individual parts" (Pascal quoted in Morin, E. 1992: 372).

Intense interconnectivity between wholes and parts means that, paradoxically, all parts of a system are simultaneously systems in themselves, and all systems are parts of larger systems. This inter-active nature means that in systems there occurs what is termed a dialogic[8] relationship between individual elements and the environment of which they are a part. Individual elements help create the environment in which they exist, but are also created by the environment in which they exist. Morin describes the relationships between the whole system and the parts of a system as one in which "The whole is greater than the whole, since the whole as a whole affects the parts…, while the parts retroactively affect the whole" (Morin, E. 1992: 374).

A paradox of complex systems is that, because each element in a system is, simultaneously, a whole system as well as a part of a larger system, in reality boundaries are indistinct and arbitrary, a matter of perception and conceptual 'framing' rather than certainty;

> "… one cannot with any certainty isolate or circumscribe a single system from
> among the system of systems of systems with which it is interlocked… which of
> the following is the system: the society, the species, or the individual" writes
> Morin (Morin, E. 1992: 375).

The problem of 'framing' and the arbitrary distinction of boundaries means that systems are constructions of the mind, models that reflect a certain understanding of the world, rather than actual fact (Naveh; 1995). The implication of framing is that our knowledge of systems and system behaviour is always incomplete, constrained by how we frame or model any system. While 'framing'

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[8] Dialogic – "in or of dialogue" (OED 7ed: 264). The word dialogic as used in systems thinking therefore indicates the continuous exchange of information or forms of energy between a system and its elements.

is necessary for some ordered human understanding of the world, ' framing' can impose self-created boundaries that prevent us from seeing other possibilities and forms of order in the world (Cilliers, 2000; Naveh, 1995; Morin, 1992). Naveh (ibid) comments that only by breaking down familiar notions of order, by extending our boundaries of perception, are we able to uncover more insightful and deeper understandings of the world, such as those that influence landscape dynamics and the emergent characteristics that result from those relationships.

2.1/4 Social Systems as Complex Systems

Drawing on the Santiago Theory of Cognition, Capra (2003; 1983) argues that, because humans are living organisms that create their own social environment, social systems are also complex systems subject to the same laws of self regulating adaptive response and self-regeneration (autopoeisis) that characterize all living organisms. Like other living systems, social systems have the capacity to self-organise, regenerate and re-create themselves. However, within social systems, the adaptive capacity of a particular society is influenced by 'social reality'.

'Social Reality' refers to the human tendency to create social constructions and institutions through the mutual agreement of members of a society, and to translate and give meaning to the world in culturally derived ways through the medium of those institutions (Searle. 2010). 'Social reality' influences the type of social institutions that humans create, and through these institutions influences human perceptions, values, meaning, mores, knowledge, ethics and traditions, and the various technologies that arise out of the confluence of all these factors. The collective of these influences gives rise to Culture. Culture arises when individuals within a social group share distinguishing similarities of ideas, traditions, values, customs, ethics and mores that shape the identity and behaviour of individual's within that group (Searle. 2001; Macy and Young Brown. 1998; Clayton and Radliffe. 1996).
 'Social Reality' influences how people within a particular culture interpret and give meaning to their experiences, determines standards for socially acceptable norms of human behaviour, and influences what people choose to pay attention to and ignore (Capra, 2003; Jung, 1957; Searle; 2001).

Morin calls these culturally derived patterns of thought, interpretation, and representation cultural 'noospheres' (Morin.1992: 10). The logic of any particular culture is a consequence of the prevailing cultural 'noosphere'.
'Social reality' has a significant influence on human behaviour as evidence suggests that social values influence what is understood as fact, as well as what people emotionally react to (Fiddes,1999; Crompton, 2010) . Fiddes (1999) argues that individual tends to base their actions upon "belief and image" rather than "absolute fact" (Fiddes; 1999:129). Emotion is closely linked to the dominant

value systems that people hold to be important (Crompton, 2010*)*. By shaping social value systems, 'social reality' has an influencing role on people emotions as well as on their understanding of the world, and these affect social behaviour.

From a systems perspective, the implication of 'social reality' for sustainability is that 'development' along a particular pathway is not inevitable, but is the emergent consequence of a particular confluence of myriad inter-connecting socio-cultural elements. The extent to which individuals and societies that find appropriate solutions to a given context will depend on how individuals understand the presenting problem, and this in turn will depend on the socio-cultural influences that inform any particular individual's sense of 'reality'. (Jung, 1957; Macy and Young Brown, 1998; Clayton and Radcliffe, 1996).

'Social Reality' suggests that there are myriad culturally derived ways of understanding the world and that these different conceptual frameworks influence people to behave in a multitude of different ways (Clayton et al, 1996; Morin, 1992; Cilliers, 2000). Hosking (1997) argues that the social reality of any particular culture is affected by a complex range of factors. These include 'interrelated social, cognitive, and political processes' (Hosking, 1997:299) and the 'sense making activities of participants' (Hosking, 1997: 301). 'Sense making activities' include the mores, values, philosophies, ethics, customs, interests, and ambitions of any particular culture. The human inclination to form self regulating, mutually agreed upon social arrangements that facilitate group co-operation has created, historically, a great diversity of world cultures with different ways of understanding the world, different ways of translating experience and events and a diversity of distinctive social arrangements (Heifetz, 1995).

There is an intricate mutually interdependent relationship between culture and humans. Humans are products of culture, but culture is created by humans.

"Societies domesticate individuals by myths and ideas which in turn domesticate societies and individuals" writes Morin (Morin, 1992: 10).

In the words of Mebratu (1998)

> "Meaningful choice of individuals is always governed by the existing physical, institutional and intellectual structure. This structural emphasis on the patterned contexts in which individuals make choices clearly has much to offer for environmental analysis… people see life through diverse prisms… and each individual's ability to imagine a positive future is constrained by his or her perspective" (Mebratu, 1998: 516).

The human inclination to form self regulating, mutually agreed upon social arrangements that facilitate group co-operation has created, historically, a great diversity of world cultures with different paradigms of perception, understanding, and knowledge, different ways of translating experience and events, and a diversity of distinctive social arrangements (Heifetz, 1995).

2.1/5 The Role of Language in Defining Social Reality

In social interpretation of the significance of events, language plays an important role.

Bowers (2002) argues that dominant cultural patterns of thought often reveal themselves in language through culturally taken for granted metaphors, narratives, mythology and idioms of expression that are used to make sense of the world and 'frame[9]' social understanding of the world. These 'frames' are often sub-consciously accepted as fact, rather than socially derived interpretations of reality (Bowers, 2002).

Bowers argues that, if language is perceived as an 'objective' and 'value free' channel of communication, then people remain unaware of the extent to which their thought processes and perceptions are influenced by traces of previous cultural ideologies, dogmas and cultural belief systems (Bowers, 2002). This leads to culturally taken for granted and unquestioned assumptions about the world.

The power of language in conveying preconceptions of the world can be seen in the fierce debate's that have been generated around the word 'development'. 'Develop' , as described by OED, means "unfold, reveal or be revealed, make or become fuller, more elaborate or systematic, or bigger, convert to new use so as to realize its potentialities, make progress, come or bring to maturity" (OED:262) . The abstract nature of 'develop' means that, without a context that describes what is to be developed, advanced or progressed, and toward what purpose these should be advanced, the word 'development' is essentially meaningless.

The value laden connotations of language means that universal understandings should not be assumed, and that to avoid confusion and miscommunication a reflective acknowledgement on meaning is required to uncover conceptual differences.

2.1/6 Agrarian Systems as a Complex Systems

A complex understanding agriculture requires understanding agricultural systems as socio -ecological constructs. That is, agrarian systems arise from the social institutions and value systems characteristic of a particular culture, but because agriculture has close inter-connections to ecological systems, agrarian cultures are also affected by the supporting ecological framework. From this perspective,

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[9] 'Frames' refer to common culturally derived conceptual understandings, narratives and world-views that people from a particular culture rely upon to make sense of the world.

farmers can be perceived simultaneously as individual elements within a broader socio-ecological system, as well as complete systems within themselves. What farmers understand about the world around them, how they translate their observations, and what they apportion value too will be influenced by the social institutions that inform their 'social reality', but farmers in turn will also influence those institutions. The farm is shaped by the farmer, and the farmer's choices affect, and are affected by, the broader 'noosphere' in which the farmer lives. Whether any land management actions farmers take are appropriate as a solution to a problem will depend on what farmers perceive to be the presenting problem, the value systems of the individual, as well as the resources they have at their disposal to deal with the problem.

In farming communities, social networks, knowledge systems, cultural traditions and social value systems form important parts of individual and communal identity that define the prevailing cultural 'noosphere'. The narratives that farmers tell are an important part of this 'noosphere, reflecting how farmers see and understand the world around them, and consequentially how they translate this understanding into land use practices.

In terms of this research paper, the historical background to Pondoland outlined in Chapter Three, and the case studies of the narratives and practices of traditional amaMpondo farmers outlined in Chapter Four, provide substantial corroboration for the value of seeing agricultural systems as complex agri-cultural-ecological systems where individual farmers are affected by, and affect, the surrounding environment in unique contextually related ways.

The case studies on Pondoland indicate that amongst amaMpondo traditional farmers, farming practices are underpinned by a particular culturally based philosophy which influences local value systems, knowledge systems and the formation of social systems which tend toward emphasising a sense of communality, rather than individuality. These local value and traditional knowledge systems provide the local context within which individual farmers operate. However, within the broad parameters provided by the local context, individual farmers still exhibit particular characteristics that are unique to each farmer. Personal experience, goals and ambition, and the particular circumstances of individual farming households also play a role in determining individual farmer's actions and practices. The Pondoland case studies also show that the local cultural and agricultural context cannot be disconnected from the broader national and global context in which local development takes place. Indeed, that a national and international failure to recognise the complex nature of inter-connections between culture and agriculture can lead to the imposition of development practices that simultaneously undermine both culture and agriculture. A deeper analysis and commentary on the nature and implications of these inter-connections for amaMpondo traditional farmers can be found in Chapters Five and Six.

2.1/7 The Conceptual Landscape

Naveh (1995) argues that the interaction between culture and landscape in human impacted landscapes creates a reciprocal, cybernetic relationship between human cultural systems and ecological systems, which he has termed the "Total Human Ecosystem" (THE). THE includes culturally determined conceptual perspectives that influence human perceptions of landscape and so determine land use, as well as the emergent physical characteristics of landscape that evolve from human-nature interactions.

Juhani Pallasmaa refers to the conceptual, existential element of landscape in the following way;

> "As we construct our self-made world, we construct projections and metaphors of our own mindscape. We dwell in the landscape, and the landscape dwells in us" (Pallasmaa; 2010: 23).

Antrop (2000) argues that awareness of landscape extends beyond the measure of the physical, and also embraces all sensory experience. This means that there is a subjective quality to landscape that cannot be divorced from the knowledge and context of the observer. This subjective, perceptual, culturally determined quality means different people may see, appreciate or utilize the same landscape in different, culturally determined ways, and creates a propensity for different societies to organise the territory around them according to their own unique psychological, economical and psychological preferences.

The implications of the experience of landscape perception and use as subjective suggests:-
-    First, that landscape uses that might be seen as appropriate within certain cultures or individuals, or periods of history, might be seen as very inappropriate by other cultures or individuals.
-    Second, as both social systems and ecological systems are subject to change over time, insight is needed into how change affects the inter-actions between socio-cultural, agrarian and ecological systems (Nusser; 2001;).
-    Third, understanding that agrarian landscapes are a consequence of the interactions between socio-cultural factors and ecological factors, means that in these landscapes common delineations between social and natural systems are artificial social constructions or conceptual 'frames' that are based upon particular cultural perception's of 'order'.

In agricultural systems, human interaction with ecological systems shapes those systems in a way that favours the production of certain products useful to humans. But the way that farmers interact with their environment is highly influenced by the prevailing cultural 'noosphere' that inform farmers'

decision making processes. The tendency is illustrated by a New Zealand study into farmers' attitudes towards landscapes which found that organic farmers, conventional farmers, and indigenous Maori had very different aesthetic perceptions of farmed landscapes (Egoz et al; 2001).

Egoz (2001) found that conventional farmers, with their preference for orderly, neat fields arranged in geometric grids, described organic farmers' attempts to emulate ecological systems as 'messy', and related this to a neglectful, lazy, unproductive work ethic. On the other hand, organic farmers viewed conventional farms as 'boring', 'uninspiring' and indicative of conventional farmers lack of understanding of natural processes. Organic farmers saw the organic farms that conventional farmers described as 'mess', as diverse and functional holistic systems. In contrast to both conventional and organic farmers, who saw the land as a resource for cultivation and intense production, Maori people had a very different production and perceptual aesthetic. The Maori aesthetic related to a very different sense of time and commitment, resulting in a completely different value system and land use ethic. The Maori saw themselves as the temporary guardians of a land inherited from their ancestors, with a commitment to pass it intact onto future generations. Consequently, they placed much significance on leaving land in an untouched, natural state.

Egoz et al (2001) found a strong correlation between the preferred landscape aesthetics of individuals, and the economic, social and ecological values of different agrarian cultures. The study shows that land use is representative of cultural tastes and value systems, and that the way farmers' farm reflects differing cultural ideologies. Egoz et al (ibid) argue that New Zealand settler farmers composition of the landscape was influenced by an attempt to recreate the familiarity of their European homeland, a conviction that production (shown in terms of cultivated landscape and an emphasis on yield/ ha) is a valuable trait, and a belief in the urgent need to produce in order to feed the world's growing population. Furthermore, that the conventional farmers cultural preference for geometry and order is a reflection of the values inherent in utilitarianism, the modernist belief in control, and a Kantian scientific approach, while organic farmers aesthetics reflect Goethian views that see nature as a living unity.

2.1/8 Value as a Cultural Trait

The relationship between landscape use and culturally defined perceptions extends beyond existential criteria such as aesthetics, and embraces elements related to 'value'. Studies have found that farmers in traditional agrarian systems often apply very different, broader sets of value and production criteria to agricultural production than the narrow focus on yield and market price typical of industrial market based systems. Amongst traditional farmers, multiple uses, pest and disease resistance, suitability for storage and climatic conditions, palatability for livestock, and unique local tastes, knowledge and socio-cultural traditions are factors that can influence the value traditional farmers give to products

(Pretty, 2008; Norberg Hodge et al ,2000; Shiva, 1995). That different cultural systems may have different measures of 'productivity', 'value', and 'efficiency' which determine "the logic of production" and affect how land is managed, suggests that 'value' and 'efficiency' are subjective properties dependent on socio-cultural context. This makes direct comparisons between the production potential of different agricultural systems problematic if these are not considered within the context of local socio-cultural paradigms (Norberg Hodge, 2000; Shiva, 1995).

If narrow, non-context related definitions of 'value' or yield are applied, based on agricultural products being seen as market commodities and 'value' being seen in terms of market profit, this can lead to traditional agricultural systems as being labelled unproductive, primitive and inefficient, although these 'home grown' agricultural systems may well serve the needs of the community in which they exist (Shackleton et al; 2000; Shiva. 1995). Evidence in support of this is given by a study by Shackleton et al (2000) in Bushbuckridge, South Africa, which found that when commonly used commercial measurement systems were applied to traditional agricultural systems, only a quarter of the use value of traditional systems was generally captured. Common reasons for error included the irregular shape of cultivated areas that made accurate measurement difficult, selective measurements that ignored certain products such as garden crops, valuing only produce that was sold and ignoring the value of produce that was bartered or consumed by the household, ignoring the value of substandard crops unsuitable for human consumption that were still used, e.g. for animal feed, and ignoring non- market related values, such as the use of animals for draft power. When broad, context related measurement criteria were applied, and a cost-benefit analysis was undertaken, the traditional systems typically labelled 'unproductive' in conventional commercial terms only produced marginally less yield than commercial operations, and lower input costs meant traditional systems were often as economically viable as commercial units (Shackleton et al; 2000).

In addition, the importance of what are often considered 'wild' resources to certain indigenous agrarian systems breaks down traditional reductionist boundaries of demarcation between 'Nature' and 'farmed landscape' (Altierei, 1989; Pimbert, 1999). What level of cultivation or management is required in order for a farm to be a farm, when is a farmer a farmer, and when is wilderness, wilderness? Are the landscapes that Maoris purposely prefer to leave 'natural', wilderness landscapes, or landscapes that are managed to suit a particular Maori cosmology? Can the purposeful decision to leave landscapes untouched for future generations be defined as an agricultural management strategy? Does leaving areas of land uncultivated for the collection 'wild' resources in order to supplement cultivated resources constitute an agrarian landscape management strategy, or a conservation management strategy?

2.1/9 'Misreading' Landscapes

Historically, interactions between diverse cultures and local ecologies created diverse traditional regional landscapes with distinct ecological and cultural properties that reflected local cultural and aesthetic values (Naveh, 1995; Antrop, 2005, Nusser, 2001). As these landscapes evolved slowly, over many centuries, changes that took place within them allowed for harmonious integration between cultural and ecological elements. Such landscapes, in which clear and supporting relationships between natural systems and cultural aesthetics and values developed landscapes with a distinct identity, are defined as traditional landscapes (Antrop; 2005).

The holistic co- evolution over time of culture and nature means that many traditional agrarian landscapes have particular importance for sustainability and sustainable development. The importance of these landscapes for maintaining socio-cultural, agrarian and natural heritage and providing "a link between the past, the present and the future" is recognised by international organisations such as ICOMOS, FOA and UNESCO (ICOMOS, 2010; UNESCO, 2003; FOA, 2008). ICOMOS points out that agricultural heritage has subsistence value, and contributes towards quality of life, respect for the landscape, and the preservation of cultural and biological diversity and related values (ICOMOS; 2010). The complex interaction between culture, agriculture and ecology in traditional landscapes, suggests that maintaining associated cultural values and traditions become important elements in conserving traditional agrarian landscapes.

Yet Adams (2009) points out that human tendencies to impose our own cultural interpretations and perceptions on any particular landscape has resulted in a long history of western misunderstanding of the relationship between indigenous people and the landscapes they inhabit. This has created a situation where the history of local ecologies, and the impact of local people on those ecologies, has been misread. In numerous instances, intense local and indigenous management of resources has been misconstrued as deforestation or degradation of natural habitat, when in reality local land use practices have created the 'forest' or 'savannah' systems that are perceived by westerners as 'natural'. Adams points out that areas that are often referred to as 'wilderness' or un-utilized land are in fact often areas inhabited by indigenous people and small farmers who actively manage those resources, cultivating certain plants, clearing others, and creating conditions that favour the germination and survival of certain species over others in order to optimize the growth of species that are favourable for human use (Adams; 2009). Similarly, Naveh (1995) argues that the modern tendency to impose the 'economic rationality' of 'developed' societies onto indigenous cultures and the landscapes they inhabit is destructive, and has lead to misunderstandings and the imposition of an 'industrial' model of agriculture onto traditional agrarian systems. Overcoming this destruction requires understanding that different cultural value systems give rise to different landscape forms, and recognizes the importance of cultural values in maintaining traditional landscapes (Naveh, 1995).

Colchester (2004) also argues that the reductionist tendency to separate Human from Nature, which until recently has informed the policies of much of the Conservation agenda, has led to many Indigenous people being displaced from their traditional lands in order to make way for conservation agenda's pursuing the establishment of nature reserves and parks. Of course, the act of setting aside and managing nature reserves as 'wilderness' constitutes a human activity itself that assumes a particular view about the human/ nature relationship and what constitutes desirable outcomes for particular landscapes. These perspectives are particularly significant in light of findings that point out that changes to the traditional compositional structure, or matrix, of human managed eco-systems such as agricultural systems has significantly important implications for biodiversity (Perfecto el at, 2009).

2.1/10 Breaking down the Human/ Nature divide

In contrast to the schismatic tendencies of a reductionist view, a complex understanding of landscape recognises that interactions between 'noosphere' and ecological systems means that, in human impacted landscapes, humans become an inherent part of the co-evolutionary processes of landscape, reacting with the landscape to create unique eco-systems that would not have occurred 'naturally' without human involvement (Naveh, 1995; Antrop, 2000; Quinlan and Scogings, 2004). As humans use our imagination and creative abilities to construct and exploit the environment, and as land usages transform with changes in cultural history, a process of continuous coevolution occurs between human societies and ecological systems, where humans continuously adapt to, and adapt, the landscape. As a consequence of this interaction, in human impacted environments, ecological relationships need to be understood as products of the interaction between humans and other organisms (Quinlan and Scogings 2004; Naveh, 1995).

However, an understanding of social reality informs that the way humans adapt the environment is culturally determined. In this arena, Bulkeley (2005) challenges traditional notions of the hegemony of nation states and hierarchical cascades of authority and calls for more complex understandings of the nature of environmental problems, based on considerations of the multitude of influences occurring at different levels and that affect local contexts. Such a complex understanding includes the realisation that differing interpretations at different levels affect the conceptualisation of problems and these influence the type and suitability of solutions that are generated.

2.1/11 "Living Landscapes"

 'Living landscapes' is a generic term that is often used in a context related manner. Based on the preceding discussion, a complex understanding of human impacted landscapes such as agrarian landscapes, suggests these have many levels.

There is an ecological level, comprised of numerous inter-connected biological and physical processes that take place and that determine a landscape's natural characteristics.

There is a socio-cultural level, which is determined by the particular cultural 'noosphere' of any society interacting with the land, and is composed of conceptual, existential, sensory elements as well as physical use elements such as technologies that are guided by the desired goals, knowledge and opportunities of the society using the land.

There is an emergent level, in which dynamic interactions between the social and ecological spheres give rise to new properties and behaviour that have the capacity, through feedback, to influence affect natural ecologies and social elements. The convergence of these levels gives agrarian landscapes unique and dynamic characteristics. The interaction between human and nature means that agrarian landscapes change through time, and these changes are built upon a pre-existing history. Landscapes are thus dynamic.

The European Landscape Convention recognises these multiple elements of landscape in its definition of landscape as "an area, as perceived by people, whose character is the result of the action and interaction of natural and/or human factors" (Council of Europe; 2000. Article 1: 1).

In order to ensure sustainability, Antrop (2005) argues that it is important to preserve landscape diversity, and to restore landscape qualities where these are degraded. The cultural inter-connection with landscape means that local cultural values that play a role in shaping landscape use need to be understood. In traditional landscape, those customs and values that have co-created unique agrarian landscapes need to be preserved if the landscape is to be conserved.

In my view, a 'Living Landscape' therefore, is one in which a sustainable symbiosis occurs between socio-cultural factors and ecological factors that act to recognise, conserve and build upon the productive and ecological functions of the landscape in a culturally appropriate manner, in order to ensure both human well-being and ecological sustainability. This concept of 'Living Landscapes', like that of agroecology, recognises linkages between culture, agrarian practice and ecological systems and aims to recognise and conserve those elements in each which lead to the well-being of both human and natural elements within the environment.

2.1/12 The Criteria for a Sustainable Agriculture

The concept of 'Living Landscapes' and agroecology have similarities in that they both recognise linkages between ecologies, culture and human production, and seek to safeguard landscapes that are ecologically sustainable, economically viable over a long period, and socio-culturally relevant.

A synopsis of numerous readings (Altieri, 1989; Pimbert, 1999; Pagiola, 1989; MEA, 2005; Sullivan, 2003; Pretty, 2006; Mollison, 1990) reveals many similarities of thought around the objectives of a sustainable agriculture. These objectives are highlighted below:-

- Conserving and regenerating local resources through sustainable use. This includes preserving the genetic and species diversity of both agricultural and biological systems, as well as being supportive of local social and economic systems. (Sullivan, 2003; McNeely and Scherr, 2001)
    - Maintaining agricultural diversity entails continuing and enhancing the diversity used for production (e.g. through sustaining diverse breeds of livestock and crops, and the cultural processes that support that diversity) as well as sustaining diversity in eco-systems that support agricultural production (e.g. soil biota, pollinators, predators, types of diverse agricultural systems) (Pimbert, 1999; Pagiola et al, 1998;)
    - Sustaining biological diversity requires maintaining "a *representative sample* of all biodiversity patterns, including species and their habitats (the principle of representation); (and) the *ecological and evolutionary processes* that allow this biodiversity to persist over time (the principle of persistence)" (Driver, Cowling, Maze, 2003).
    - Economic and social sustainability. (Sullivan, 2003; Pretty, 2006; Altieri, 1989) This includes maintaining the farm as a profitable enterprise, giving support to local enterprises and the local economy, and providing an attractive proposition to young people to take up farming.
- Establishing food security and food sovereignty (Pimbert, 2008; Altieri, 1989) Food security entails affordable access to sufficient nutritious food to maintain health, while food sovereignty requires maintaining the means to produce sufficient food. Self reliance, the empowerment of rural communities and farmer control over the means of production are pre-requisites for food sovereignty.
- Keeping control over the sources of production (Pimbert; 2008)
- This requires:-
    - a context related, participatory approach that takes into account the diverse nature of agricultural systems and the key role of rural communities in perpetuating agricultural production, (Sullivan, 2003; Pimbert, 2006)
    - establishing suitable supportive policies that encourage practices that are economically and technologically viable for the farmer, ecologically sustainable, and that promote the viability of rural livelihoods. Such policies need to encourage proper pricing of goods and services, local and domestic consumption, legitimate and

participatory governance structures, and socio-cultural appropriateness. (Pretty, 2006; Pimbert, 2006; Sullivan, 2003)

- Promoting and maintaining good social relationships and security, including peace of mind, security of tenure, and freedom from violence (Pretty, 2006; Pimbert, 2008; Altieri, 1989)

In terms of practice, a number of restorative and conserving methodologies are considered important to achieve sustainable agricultural practices. These include:-

- Reducing the use of external inputs and pollution by on-farm re-cycling. This includes recycling available biomass into the soil to restore soil organic matter and nutrient levels (Mollison, 1990; Sullivan, 2003; Lampkin; 1999)

- A holistic approach that includes understanding the complex soil inter-actions that occur between soil biota (such as earthworms and microbes), physical soil structure and soil organic matter in order to promote plant growth,(Sullivan, 2003; Pagiola et al, 1998; Altieri, 1989 Rosenberg and Linders, 2004)

- Protecting the soil from undue disturbance and erosive elements such as wind and water by correct contouring, wind breaks and keeping soil constantly covered through use of mulches, 'no till' practices, and dense permanent plant cover.(Sullivan, 2003; Lampkin, 1999; Rosenberg and Linders, 2004)

- Maximizing plant and species diversity through integrated agrarian systems that include diverse livestock and cropping systems, and heterogeneous cultivation of crops through poly- culture and rotation cropping, and creating space for ecologically viable natural areas.

- Promoting the functioning of natural ecological cycles through enhancing biological synergies, such as those provided by companion planting and 'push-pull' pest control methods, in order to reduce the use of toxic chemicals such as pesticides (Mollison, 1990; Altieri, 1989; Pagiola, 1998; Lampkin, 1999).

- Conservative use of both renewable and non-renewable resources, in order to reduce the ecological footprint of farming activities (Mollison, 1990; Altieri, 1989; Pagiola, 1998; Pimbert, 1999)

- The restoration of degraded landscapes, where these have occurred (Mellor; 2002; Altieri, 1989; Mollison, 1990).

Currently, various 'agroecological', ' biological farming', and 'organic' schools of thought promote a variety of agricultural methods aimed at enhancing and emulating natural cycle functioning. These include Bill Mollison's 'Permaculture' (Mollison, 1990), Rudolf Steiner's "Biodynamic farming", various "Low Till", and "No Till" practices that focus on reducing soil disturbance, and 'Natural Farming' practices that attempt to emulate natural cycles and reduce human interference such as

Masanobu Fukuoka's methods outlined in 'The One Straw Revolution' (Fukuoka, 2008). Although different schools of thought emphasise different aspects, the primary focus of agroecological methods of agriculture is to develop a complex understanding of the role of ecological relationships in agricultural systems in order to enhance agricultural productivity and human well-being, health and resilience, while simultaneously reducing negative externalities that lead to ecological and social degradation. The inter-related nature of these elements requires a context related, holistic approach. Reduced tillage, crop rotations, inter-cropping and poly-cropping, and the incorporation of mulches, composts and rotational planting, and developing an understanding of local ecologies in order to make optimal use of natural biological processes in production and so reduce external inputs, are common practices encouraged by all these schools (Lampkin, 1999).

In contrast, 'Nature Conservation' approaches emphasise the importance of maintaining viable and representative areas of undisturbed natural habitat within agricultural landscapes in order to reduce natural biodiversity loss. Such approaches often call for an intensification of agricultural production in areas under agriculture in order to release land for conservation purposes (Mellor, 2002; IUCN, 2008). Yet, as Perfecto et al (2009) argue, the call for agricultural intensification ignores that the composition of land use, or matrix patterning, that results as a consequence of different agricultural systems and practices plays a significant role in biodiversity conservation. Consequently, in developing a sustainable agriculture it is important to pay attention to how different agricultural systems affect biodiversity and promote agrarian practices that have least impact on biodiversity distributions. In this sense, agroecological methods that mimic natural ecosystems have been proven to be less destructive of biodiversity than agricultural intensification using chemical industrial methods as typified by the Green Revolution approach (Perfecto et al; 2009).

If agriculture is a social construct then, as Gary Holthaus (2008) argues, a prerequisite for creating a sustainable agriculture is the creation of a sustainable culture. "There's not much point in talking about a sustainable agriculture if you don't have a sustainable culture to back it up" (Prescott Bergh quoted in Holthaus; 2008:75). This begs the question, what sort of culture gives rise to a sustainable agriculture?

Holthaus outlines the criteria for a sustainable culture as including:-
-   A spiritual life that leads to taking care of one another and Earth,
-   A language and cultural stories that foster sustainability.
-   An education system that recognise inter-connectivity between the past, the present and the future, and that works to transcend mistakes.

- Courtesy systems that allow for respectful and peaceful resolutions to social conflict, and enable conflict and confrontation to be avoided.

- Holistic, integrated viewpoints that perceive the complexity of life and strong reliance on personal observation and experience to guide behaviour.

- Care for the land-base, which includes concern for its regeneration, a comprehensive accounting system that does not ignore externalities and recognition of human unity with nature.

- Profound democracy.

- A core of integrity based on an ethical system that values balance, harmony and reciprocity, that emphasises maintaining social justice and peace, and in which communal welfare considered more important that individual ambition.

- Recognition of the value of gender, linguistic and ethnic diversity.

With this in mind, it is worth briefly examining dominant trends in global agriculture.

2. Section 2: Trends in Modern Agriculture

2.2/1 Influences on the Modern Agrarian Landscape

In complex systems, such as agrarian landscapes, sustainability requires that the resilience of the individual elements that make up the system should be maintained or enhanced. Resilience is the ability of a system to survive and adapt to change and fluctuations in the system's environment. Resilience is a consequence of diversity, where many diverse elements in a system create 'many feedback loops that can work in different ways to restore a system even after a large perturbation' (Meadows, 2008: 754). Loss of resilience results in a system becoming increasing vulnerable to disruptions. As diversity is a pre-requisite for resilience, resilience in agrarian landscapes requires the promotion of those ecological, agricultural and social elements that support particular landscapes diverse characteristics.

It is therefore concerning that changes in agriculture since 1960 have seen an increasing move away from a cultural, biological and agrarian diversity, towards uniform 'one size fits all' industrial type

models of development typified by 'Green Revolution[10]' production systems (MEA, 2005; Alteiri, 1989; Antrop, 2005; Pimbert, 1999). Antrop (2005) argues that this shift has deformed many traditional landscapes into modern landscapes primarily characterized by uniformity and lack of sense of place and local identity. These changes have been influenced by the broader socio-cultural, political and economic context of contemporary industrial society. A combination of social value systems, economic, political and cultural ideologies, consumption patterns, polluting and wasteful technology, and population growth rates has led to wasteful and polluting industrial development processes that diminish the resilience of natural eco-systems (Dresner, 2002; Bartelmus, 1994; Maclaren, 2003; Stiglitz, 2002).

High consumption levels are encouraged by materialistic social values that associate material wealth with well-being and prestige (Dresner, 2002, Maclaren, 2003; Bartelmus, 1994), political and economic emphasis on perpetual economic growth as a panacea for poverty (Stiglitz, 2002), the materialistic expectations of a rising middle class, and exponentially increasing population growth rates (Bartelmus, 1994; Wackernagel and Rees, 1996). Inequitable access to resources is prompted by economic and cultural ideologies that emphasise competition, while reductionist viewpoints lead to a failure to see the nature of complex inter-connections between various factors (Maclaren, 2003; Bartelmus, 1994; Macy and Young Brown, 1998; Meadows, 2008). The dynamics of this combination of factors has seen huge inequalities that set in motion a vicious cycle of increasing ecological decline while, simultaneously, human demands upon limited ecological resources increase exponentially (see Box 2, pg 34).

Wagernagel and Rees's (1996) work on 'Ecological Footprinting[11]' shows that highly consumptive lifestyles typically associated with wealthy nations such as the United States of America (USA) have a much greater overall ecological impact than the less consumptive lifestyles of poorer people. 'Ecological Footprinting' suggests the planet would only be able to sustainably support 2 billion people at the level of affluence of the average US citizen, but could potentially support 40 billion citizens at the consumption level of rural Africa.

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[10] The 'Green Revolution' refers to technological attempts to improve yields and increase soil fertility by concentrating on intensification of agriculture through mechanization, selective seed breeding, and applications of chemical fertilizers, pesticides and herbicides, and extensive use of irrigation.

[11] ' Ecological Footprinting' follows the cradle to grave ecological impacts of various activities.

Box 2. Illustration of connections between ecological resources use, economic development, consumption, production and human well-being. Source Valerie Payn
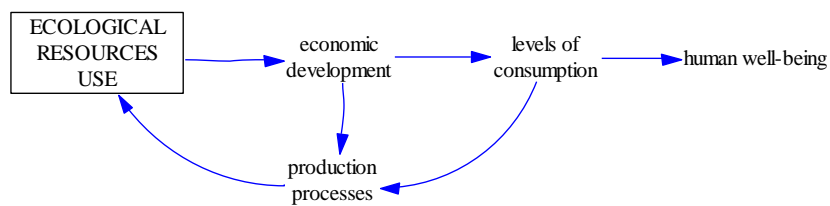
Ecological resource use is inter-linked with the trajectory of economic development. The extent to which ecological resources use is sustainable depends upon the combination of consumption levels, whether production processes are efficient, non-wasting and non-polluting, and the ability of eco-systems to regenerate. If ecologically degrading production processes and over-consumption lead to degraded ecosystems, this reduces the regeneration capacity and resilience of eco-systems, with adverse implications for human well being. Sustainable economic development requires production processes that enhance, or maintain, ecological systems regeneration capacity.

2.2/2 "The Green Revolution"

In a narrow sense, modern industrial agricultural practices appear extra-ordinarily successful, with global rates of agricultural production to date exceeding exponentially increasing population growth rates. Since 1960 global populations have increased from around 3 billion people to today's estimate of approximately 7 billion people (United States Census Bureau; United Nations Population Division, http://www.un.org/esa/population/publications). In developing countries, estimates suggest food production increased fourfold (MEA; 2005). Altieri (1989) suggests a more modest estimated 11% increase in the monoculture production of certain cash crops between 1970 and 1990 as consequence of the adaption of 'Green Revolution' production systems (Altieri, 1989).

 Many credit the 'Green Revolution' with this agrarian success, leading to comments such as those of Uphoff (2002)

> "Without the Green Revolution global food production would be half what it
> was by 2000 and the environmental impacts of moving food production into
> environmentally unsuitable areas would be far more serious than they are today"
> (Uphoff, 2002)

Similar assumptions underlie FAO claims that increased agricultural productivity as a consequence of 'Green Revolution' practices have meant less natural habitat has been converted to agricultural production than would otherwise have been the case.

However, these are questionable assumptions, for they presuppose that the "Green revolution" was the only viable option of agrarian development and ignore the stifling effects of technological 'lock-in' in developing other options. Claims such as those of Uphoff (2002) assume that "Green Revolution" practices are less environmentally hazardous and more productive than other agrarian systems, ignoring evidence that over-reliance on chemicals has had debilitating long term effects on soil fertility and agrarian environments. In addition, the promotion of 'Green Revolution' practices overlooks evidence that suggests that increased food production has not necessarily led to reduced global hunger and that surplus production as a consequence of 'Green Revolution' methods has undermined many rural societies and many traditional systems of agriculture, leading to a decrease in agrarian and cultural diversity (Patel,2007; Lampkin, 1999).

Patel (2007) argues that overproduction of certain crops through "Green Revolution' technologies was a deliberate US Cold War ploy between 1956 and 1960 in order to keep prices artificially low to provide cheap food and smother communist insurrection. His argument is lent support by the fact that, despite increases in global food production allowing an adequate global per capita quantity of food, malnutrition and hunger are still widespread. The frequent co-existence of malnourishment and obesity points to the existence of complex socio-economic issues around food production. Sen's (1981) seminal study on famine, pointing out that no major famines have ever taken place in democratic societies, has fuelled arguments that global food availability is a political and economic problem of distribution, rather than a production problem of quantity.

In addition, concerns are that the high external inputs and mechanisation of 'Green Revolution' practices make these technologies unaffordable to small scale farmers. The combination of high input expenses, combined with neo-liberal global agricultural policies endorsed by organizations such as the World Bank (WB) and World Trade Organisation (WTO) since the 1980's that have reduced government investment in the agriculture and research programmes of many developing countries, prevented protectionist social and public policies, and promoted inequitable subsidies and trade terms that favour developed countries, make it difficult for unsubsidized farmers from poorer nations to compete in global markets or against the economies of scale of highly mechanized systems of agriculture (Stiglitz, 2002 ; Brown et al, 2001; Bartelmus, 1994; Dresner, 2002; IAASTD; 2009).

Bryceson (2002) argues that, in contrast to mainstream tendencies to denigrate traditional agrarian peasant societies as being incapable of responding to globalization and neo-liberalism, the de-agrarianisation and social re-organisation of these traditional agrarian societies is an indication of

strong social responsiveness to structural adjustment policies that have undermined traditional peasant commodity production, economic competitiveness, social stability and the class position of peasant societies (Bryceson, 2002). In a similar vein, Patel (2007) argues that, contrary to the orthodoxies of neo –liberal economic theory, the effect of turning food supply over to the market has been to produce less competition and consolidate the power of the largest companies. According to Patel (2007), transnational corporations currently control 40% of world trade in food, with 20 companies controlling the global coffee trade, 6 controlling 70% of the global wheat trade, and 1 company controlling 98% of packaged tea. Half the world's seed supplies, 55% of veterinary drugs and 84% of the global pesticide market are controlled by 10 large companies (Patel, 2007:99-104). Consolidation has increased the distance between producers and customers, incurred increasing costs on goods throughout the chain of supply, increased the carbon footprint of the food production system, and reduced farm gate prices. Using coffee as an example, Patel (2007) shows that the 14c/kg that a small farmer in Uganda gets inflated through the distribution buyer chains to US $1.64/ kg by the time it reaches the Nestle West London processing plant. By the time the coffee is sold in supermarket shelves and coffee shops, the prices is US $26.40/Kg. Patel points out this is 200 times the price of a kilogram of coffee in Uganda (Patel, 2007:10).

Since 1984, farm produce value has decreased on average by 35.7%, while the consumer price of food has increased by a real cost of 2.8% (Patel, 2007:104; Moffet; 2007). Lampkin notes that, since the 1970's, farm incomes have fallen by an average of 50% (Lampkin, 1999). These combined influences have increased farmers vulnerability to capricious market forces and natural pestilences, while government under-investment in agriculture has seen a simultaneous rise in corporate sponsored research agenda's that ignore the needs of small scale and traditional farmers and promote a uniform, industrial scale agricultural agenda (Altieri, 1989; Patel, 2007; McMichael, 2007).

In addition, the growing influence of globalization on agrarian systems has been instrumental in affecting consumer tastes and demands, with close connections between advertising, increased access to media, and the profit maximizing agendas of transnational corporations, increased materialism and changing consumer tastes (State of the World; 2011). Schlosser (2002) shows how the global fast food industry has been influential in shaping consumer taste, agricultural production systems, and human, livestock and ecological health. Globalization and the interests of transnational corporate agendas are often closely related. Evidence suggests the profit motives of corporations are a primary driving force behind the recent push for a 'new green revolution' in Africa, with its promotion of 'Green Revolution' high yielding crop varieties, pesticides and chemicals, promotion of Genetically Modified crops and intense use of irrigation (Magdoff, 2007).

Davies (2006) argues that, unlike the urbanization of the developed world which was driven by increasing urban prosperity and industrial development, increased rural poverty as a consequence of

failed agrarian policies has driven much of the recent urbanization in the developing world. Others point out that relationships between urbanisation and the commoditization, industrialization and corporatization of agriculture have aggravated oversupply in certain regions and food insecurity in other areas. Oversupply contributes to low product prices that depress the viability of farm livelihoods, driving many small farmers into debt and insolvency and forcing them off the land and into urban slums (Patel, 2007; McMichael, 2007). While urbanisation can create market opportunities, Marx's theory of Metabolic Rift (Foster, 1999) argues that there are conflicting agenda's between the requirements of rural farming communities and urban consumers demanding cheap food and resources, and that capitalist political agenda's have significantly skewed global agrarian policies in favour of urban centres, to the detriment of farm livelihoods and rural communities and ecologies (McClaughlin and Clow, 2004; also Patel, 2007; Davies, 2006). According to the World Development Report (2008) an estimated 86% of rural dwellers, 1.3 billion people globally, depend directly on agriculture for their livelihood. In the developing world, 3 billion people live in rural areas and 2.5 billion are involved in agriculture, of which 1.5 billion are smallholder farmers (World Development Report 2008, Agriculture). The impacts of a decline in farm gate prices have significant repercussive effects for rural livelihoods strategies and possibilities.

Box 3. Diagram showing cyclical relationships between farm incomes, rural/ urban migrations and food price. Source Valerie Payn

Farm income has a direct bearing on the sustainability of rural livelihoods, which in turn affects the viability of rural development. The state of rural development impacts on the scale of rural to urban migrations, and this has implications for food prices, which in turn potentially affect farm incomes.
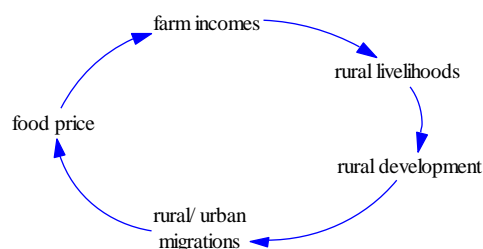
2.2/3 Environmental Impacts

While the "Green Revolution' package of mechanisation and technological solutions brought an increase to crop yields of certain cultivars, it also saw a massive increase in polluting chemical and energy use in the agricultural sector. Impacts include long term declining soil fertility through changes to soil structure, micro-biology and organic carbon content (Jones, 2007; Lampkin, 1999), degradation of the environment through pollution as a consequence of intense chemical use and reliance on energy and water intensive cultivation techniques, rising costs related to the 'high external input' (HEI) needs of Green Revolution practices, and loss of cultural and agricultural diversity as many traditional systems of agriculture are usurped by the 'modernisation' agenda of the "Green Revolution'.

The 'Green Revolution' focus on breeding for uniformity and yield has led to the genetic erosion of a broad base of diverse genetic plant and livestock material, reducing the resilience of the modern agricultural system. With almost half the world's agricultural land (1.5 Billion hectares) now planted to annual monoculture crops, primarily maize, rice, wheat, soybeans and cotton, agricultural diversity has been adversely affected (GEO 4). Since 1985, Korea has lost 74% of the variety from 14 agricultural crop groups (FAO, 1996). Maize varieties in Mexico have declined by 80% since 1930. Brazil has lost 20 of its 32 native pig breeds, and half of Europe's 2,576 livestock breeds are considered at risk, while the number of domestic European bird breeds considered at risk increased from 65 to 76% between 1995 and 1999 (MEA, 2005; Fowler, 1991).

The 'Green Revolution's' high external input reliance on linear resource flows, with mechanical and chemically intensive production techniques that require resources brought in from external sources and toxic wastes discarded back into the environment exacerbates global pollution levels (Mollison,1991; Birkeland, 2002, Gasson, 2002). This is in contrast to many traditional methods of farming, where production involves the recycling of commonly available, renewable resources within local environments.

2.2/4 Chemical use and Nutrient mining

While high levels of chemical use contribute to high pollution levels, increases in chemical use may mask declining levels of agricultural productivity due to soil degradation and nutrient mining. Nutrient mining occurs as a consequence of the failure to replace lost nutrients, disturbances that result in loss of microbial soil biodiversity and other important components of soil eco-systems, homogenization of agricultural systems that lead to the simplification of landscapes and landscape structures, and bio-invasions that disturb natural soil building processes (Bringezu et al; 2010)**.** Lal (in Bringezu et al; 2010) estimates that in 1970, worldwide, nutrients in the soil provided 48% of plant

nutrients, 39% was supplied by fertilizers and 13% from manures. By 1990, levels of in-soil nutrients had dropped to 30%, with 60% of nutrients being derived from chemical fertilisers, and 10% from manures. If current trends continue, by 2020 70% of nutrient will have to be supplied by chemical fertilisers, and in-soil nutrients would have decreased to 21% (quoted in Bringezu et al 2010).

UNEP (2008) estimates that over the last 1000 years, 2 billion hectares of productive agricultural land have been damaged through soil degradation, leading to a corresponding decline in the productive capacity of agricultural land. As a consequence, between 5 million and 12 million hectares of land are abandoned annually. Over the last 50 years, estimates suggest the global costs of reduced productivity as a consequence of land degradation amounts to around US$40 billion annually. This amount does not include externalities, such as biodiversity loss and increased input costs required for production on degraded land (FOA, 2006, http://www.fao.org/nr/land/degradation/en/). Laker (not dated) suggests that in South Africa only about 13% of land is arable, and only 3% of this is considered to be highly productive, with the rest being considered marginal. Of South Africa's 14 million ha arable land, only 1.5 million can be irrigated due to limited water resources. Estimates suggest that South Africa lost 25% of its topsoil during the last century due to a combination of the high vulnerability of its soils and degrading land practices (Laker, n.d).

Global estimates of soil degradation
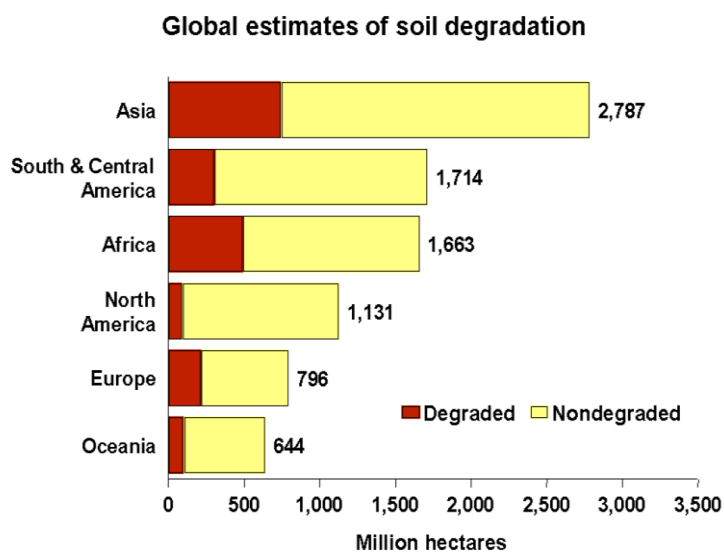
Source: S. Scherr, *Soil degradation: A threat to developing-country food security in 2020?* (Washington, D.C.: IFPRI, 1999).

If farmers react to declining soil fertility by increasing land areas under cultivation, or shifting to previously uncultivated area, this contributes to natural habitat loss. Expansion onto susceptible land areas that are marginal for agriculture can lead to further land degradation, setting in place a vicious cycle of increasing habitat conversion, reduced soil fertility, and land degradation. Declining soil

fertility contributes to global food price increases, as yields drop and the limits of suitable arable land restrict agricultural expansion (Swilling and Swilling; 2009).

2.2/5 Climate Change and Water Resources

While agriculture is expected to be significantly affected by climate change, the high energy and chemical inputs of modern agricultural practices contribute to human induced climate change. Nitrogen based fertilizers account for 38% of agricultural greenhouse gas emissions (IPCC Report, 2007), while land use change that promotes rapid oxidization of soil organic matter contributes towards greenhouse gas emissions (Magdoff, 2007). Yet evidence suggesting that sustainable agricultural practices can potentially mitigate against climate change (UNCTAD, 2007) highlights the point raised in 1.1/6; namely the importance of recognising that different agricultural systems have differing ecological impacts. Concerns about the impacts of climate change on water resources is believed to have contributed towards 'foreign land grabs' (Hall et al, 2007; UN, 2010), and in stimulating interest in areas such as Sub-Saharan Africa, which is perceived to be using only about 2% of its water resources. The foreign usurpation of regional water supplies raises concerns about maintaining the food sovereignty of domestic producers (UN Sustainable Development Innovation Briefs. 2010). Otterpohl (2000), however, argues that the issue of water shortages in not one of lack of water, but of misuse of available resources (Otterpohl, 2000: 6).

Ecologically degrading agricultural practices, including land conversion, habitat change and pollution, are cited by the 2005 Millennium Ecosystem Assessment as playing a role in the 30% decline in global biodiversity levels experienced since 1970, a situation that has been called 'the greatest extinction crisis… in 65 million years' (Brown et al. 2001:4). Land conversion as a consequence of agriculture has significantly affected 6 of the world's major terrestrial zones, and has also impacted on Oceanic systems. The existence of numerous oceanic 'dead zones' in places as far afield as the Baltic sea, Uruguay and Gulf of Thailand, the Black Sea and the Gulf of Mexico have been blamed primarily on polluting agricultural practices (MEA, 2005). The South African Environmental Outlook (SAEO) estimates that in South Africa, the economic costs of soil degradation and biodiversity loss as a consequence of poor land management amounts to R3.5 billion annually.

2.2/6 Future Scenarios

Recent indications suggest that the combined influences of growing populations, various environmental changes associated with climate change, declining soil fertility, pollution, increasing urban development, rising consumptive demand and increasing affluence, and limited arable land may have curtailed the trend of increasing agricultural production. The 2010 OECD-FAO report suggests we are facing a reversal of long term trends that have seen continuously falling mean food prices in

recent decades, and that food commodity prices are set to increase over coming years (OECD & FAO. 2010:18). These developments have re-invigorated Malthusian[12] arguments that population growth will outstrip available food supply. Conventional wisdom is that solutions lie in increasing agricultural productivity, which either requires an intensification of agricultural production or an increase in the extent of land cultivated, with some calling for a 'New Green Revolution" based on investment in highly technology that involves precision farming methods and use of artificial breeding technology such as Genetic Modification (Foresight, 2010; World Development Report, 2008). Conversely, critics (Patel, 2007; McMichael, 2007; Uphoff, 2002; Shiva, 1995) point out that the high social and ecological costs of the 'Green Revolution' call for more holistic approaches to agricultural development based on deeper contextual understanding of the cultural and ecological systems in which agriculture takes place, and a correction of the inherent inequalities in the global agricultural system.

Alternative approaches to a 'New Green Revolution' are given support by evidence showing that agroecological methods of agriculture can be highly productive without the debilitating side effects of the 'Green Revolution' approach (Badgley et al, 2007; Pretty, 2006; Madeley; 2002;). Research shows that, contrary to 'Green Revolution' claims of yield increases, the production potential of traditional agricultural systems often matched, and sometimes exceeded, that of monoculture systems. Eighteenth century studies into paddy field production in 800 Indian villages, done by Thomas Barnard, found average yields of around 3,600kg per hectare. Highest yields averaged 8 200kg per hectare, exceeding average yields under 'Green Revolution' techniques (Madeley; 2002:26).

A study of the production potential of agroecological systems, compiled by Pretty (2006) as part of the World Banks World Development Report, found an average yield increase of 79% across diverse localities and agricultural systems that analysed 286 projects over 57 countries, and involved 12.6 million small farmers. In addition, under rain fed conditions, water efficiency improved by up to 107.5% for legumes, cereals, tubers and roots, and by as much as 256.6 % for fruits and vegetables. Other positive impacts included improved water retention, increased agricultural diversity, reduced soil degradation, and an improvement in social capital such as internal organisation, health, social connectivity, reversed urban migration and improved management skills. A comparative study of yield ratios by Badgley et al (2007), of the production potential of 'organic' farming compared to conventional farming, found that organically based farming had the potential to support much higher

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[12] Malthusian theories hypothesize a direct correlation between availability of land, agricultural production and food supply. Malthus predicted that exponential increases in population growth would sooner or later outstrip the land available for food.

human populations than at present, without the need to convert more land to agriculture (Badgley et al; 2007).

The combined negative social, economic and ecological impacts of the "Green Revolution' raise questions about the wisdom of following a narrow, technologically focused approach that excludes an understanding of social and ecological impacts. Concerns over social and ecological impacts have fuelled debates around the use of GMO's, with critics (La Via Campesina, 2011; http://www.gmcontaminationregister.org/ (20/8/2011)) warning against the unknown implications of GMO use on human, animal and ecological health.

While the 'Green Revolution' might have been extra-ordinarily successful in raising the yield of a limited variety of crops over a short time, its broader and long term impacts have revealed extensive deficiencies in terms of creating a sustainable agriculture. By impacting on biological, agrarian and socio-cultural diversity, 'Green Revolution' technologies have reduced the resilience of the global food system.

Section 3: Philosophical Influences on Modern Development

"...the way environmental problems are formulated and understood has considerable significance for the possibility of dealing with them equitably and effectively" (Adams, 2009:20).

If human actions are largely a consequence of the way we think, then understanding the world views of various societies becomes a key pre-requisite for understanding the agrarian systems that various societies create, how agrarian systems evolve or remain constant, and for understanding the type of solutions that are proposed in the search for sustainable agrarian systems. Following Adams (2009) mantra quoted above, in this section I will broadly examine various dominant world views for the insights they give into ways of thinking about sustainability.

In any society or individual, many ways of thinking might be simultaneously present, and variations of thought are likely to be a matter of degree rather than absolutes. This makes it difficult to strictly categorize intangible elements such as social philosophies. Nonetheless, for this exercise I believe broad categorization can assist in developing an understanding of how philosophical influences shape the notion of sustainability and development in the contemporary world.

A review of literature reveals two main streams of thought around sustainability and human/ nature relationships, which are shaping the current age. Adams (2009) refers to these as Mainstream Sustainable Development (MSD), and what are often referred to as Alternative, Radical or Transformative views.

2.3/1 Mainstream Sustainable Development (MSD)

Adams (2009) describes MSD as an offshoot of the global dominance of capitalism and economic developmentalism that sees development primarily in terms of modernisation towards an industrial agenda in order to power economic growth (Adams, 2009; 116-117).   Rooted in mainstream visions, MSD does not challenge the underlying predominating cultural value systems and philosophies that underpin the modern world. According to critics, the MSD view of development places emphasis on economic growth (measured by selective indices such Gross Domestic Product) as an indicator of human prosperity, confuses 'well being' with materialistic affluence, consumption and technological development, and perpetuates the belief that Nature should be exploited in the interests of economic growth (Adams, 2009; Norberg-Hodge, 2000; Morin, 1999; McMichael, 2007). McMichael (2007) argues that the perception of 'development' as economic industrialization has become synonymous with 'modernization', and in this form 'development' is pushed through global institutions such as the United Nations Food and Agriculture Organization, World Bank and International Monetary Fund.

Underlying these mainstream views of development are the assumptions that the world is made of individual and separate objects, that science is capable of providing objective answers that represent 'truth', and that life evolves in a progressive, linear, hierarchical pattern, from lower to higher 'more advanced' forms of life (Norberg- Hodge, 2000; Morin, 1992; Harding, 2006; Capra, 2003 ; Clayton and Radcliff, 1996). These combined influences have created a tendency to see 'the individual as being separate and distinct from the rest of the world' (McCullum, 2005: 99). The influence of this schismatics worldview undermines a sense of community and human relatedness to Nature, and fosters institutional fragmentation, an inability to see the inter-linked nature of many issues, discord between different value systems (because objectivity requires that there can only be one 'truth'), and the perpetuation of narrow industrial view of development. From this perspective 'development' is equated with a hierarchical progression toward increasing levels of technological superiority, with technologically advanced and industrialized aka 'developed' countries being held up as examples for emulation (Adams, 2009; Maclaren, 2003; Bartelmus; 1994; Mies and Shiva; Bartelmus; 1994).

According to critics, the assumptions underlying MSD stifle the potential of seeing value in other ways of life, and invite an excuse to impose a particularly westernized vision of 'development' onto other cultures that are perceived to be technologically 'backward' or 'barbaric', even if these cultures

are well adapted to live sustainably within local ecological limits (Norberg –Hodge, 1991; Macy and Young Brown, 1998; Adams, 2009). In these terms, 'development' becomes an excuse for colonization and to promote the exclusion, or genocide, of other supposedly 'barbaric' cultures (Norberg Hodge, 1991:2-3). Similarly, Adams argues that the inclination to see 'development' in western terms invites interference in people's lives under the guise of 'advancement' or 'progress', and prevents our imagining of different realities (Adams, 2009:7). In addition, the notion of 'perfect free markets' and of markets as an instrument of change, ignore the reality of political economy and market distortions imposed by 'real life' such as social values, political and economic power, the role of social institutions and policies, the reality of ecological limits, and assumes that all cultures over all time will have similar notions of value (Doppelt, 2008).

Parallel to MSD views, a variety of alternative visions of development have come into being which challenge the mainstream view of development.

2.3/2 Transformative views

Transformative views are influenced by such diverse philosophies as Marxist- socialism, feminism and bio-centricism, what O'Riordan (1999) calls 'Eco-centric' views, and various Indigenous and Eastern philosophies. If they have anything in common, 'Transformative views' reject the belief that MSD can deliver appropriate solutions, help call attention to the way that mainstream discourses shape our thinking and behaviour, and advocate for 'a politics of transformation' (Adams, 2009; Hattingh, 1999; 77). Transformative views have lead the way in criticisms of current pathways of development, and produced calls for alternatives to the mainstream, such as decentralization, democratic participation, self-sufficiency, alternative lifestyles and technologies, and radical new ways of thinking and understanding. Examples of transformative views include Arne Naess's (1999) concept of a 'Deep Ecology', while Indigenous traditions such as the African concepts of Ubuntu and the related ideal of Ukama provide an Indigenous examples of understanding human relationships to the world.

2.3/4 "Deep Ecology"

Arne Naess (1999) the founder of the 'Deep Ecology' movement, saw 'Deep ecology' as a value based approach that requires the acceptance of certain values as the norm. In this sense it is an 'eco-philosophical approach', concerned with the philosophy of realizing the wisdom and values that support ecological harmony, not just a science based ecological or technological approach.

The 'Deep Ecology' view sees Earth as a complex, living, closely inter-connected, evolving web of organic and inorganic elements. Within this web, Humans are "plain members of the biotic

community" linked to all other elements in the living system through vast networks of relationships. By seeing Humans as an inter-connected part of a complex living Earth network, 'Deep Ecology' questions the assumption of a Human/ Nature divide perpetuated by reductionism, and encourages a holistic, systemic view of Earth / Human relationships that overcomes the fragmenting tendencies of reductionism and encourages the realization that Human fate is inter-twined with the fate of all other entities on Earth and in the Cosmos (Harding, 2006; Naveh, 1995; Capra, 1996; Naess, 1999).

2.3/5 Ubuntu and Ukama

"Ubuntu asserts that a person is only a person in, through and with other people" (Prozesky, 2009; 301)

"The world of forces is like a spider web, of which one single thread cannot be caused to vibrate without shaking the whole network" (Bujo, 2009:282 quoting Tempels).

Murove (2009) describes Ubuntu as the idea that our humanness is derived from our relatedness to others, both the living and to past and future generations. Ubuntu is a holistic concept that sees humans as being inter-dependence with a broader community, including the total environment in which they exist.

Ukama is a concept of relatedness. Moruve (2009) describes it as a word that means belonging, or having kinship ties, but it is not restricted to familial ties. Ukama presumes all people are related, in that they live in a state of inter-generational social, spiritual and ecological inter-relatedness to each other.

" ...the division between the living and dead crumbles because people are an extension of the lives of their ancestors...Thus Ukama calls for harmony between the past, present and future. None of these dimensions should be compromised at the expense of the other...the present generations actions have a causal influence on future generation in the same way that the past has a causal influence on the present" (Murove; 2009: 315).

Together, Ubuntu and Ukama provide a holistic, relational concept of reality that sees connections between people, between generations, and between people and the environment. It provides a sense of inter-generational continuity, and the passing of inter-generational wisdom, values and knowledge. Moruve (2009) argues that Ukama expresses the relationship between people (muntu) and the environment as an all encompassing inter-dependent relationship where the state of human well-being is indispensible from the immediate environment (Murove, 2009: 315). As the present is a consequence of the past, and the future the consequence of these both, Ubuntu does not describe a static state of being, but an evolving state of becoming. Being fully human requires being in a relationship with all that makes existence, past, present and future. The world consists of interdependent forces where all beings influence one another. Human is a microcosm within the macrocosm, and personal salvation is connected to the cosmos. As the Cosmos is the manifestation of God the creator, it has sacred dimensions. This connection means one can only save oneself by saving the cosmos too (Bujo, 2009:282). The sense of broad community engendered by Ubuntu/ Ukama implies a responsibility towards, and an interest in, the lives of others. It also implies a sense of community towards other states of being. Communality is seen as being more important than individuality. The presumption of a reciprocal relationship between muntu (human) and nature implies there is no division between Human society and other living things. All things are believed to be reflections of the image of God, and all of Nature is thus a manifestation of God, and has sacred properties. This creates an African tendency to give 'soul' to other forms of life such as plants and animals, and a spiritual belief in the power of Nature to influence human affairs. Through Ubuntu, Africans seek harmony between all living things, and between the past, the present and the future. Wisdom entails responding appropriately, taking all possible factors into account. (see also Box 4 pp 47)

2.3/6 Development as Meeting Basic Human Needs

In contrast to the narrow view of development as 'western industrialisation and economic development', alternative views provide more holistic perspectives of development, such as the concept of development as the ability to meet a broad range of basic human needs (Cruz et al; 2009). These basic needs are common to all humanity, and involve addressing subsistence, protection, understanding, affection, identity, participation, creation, idleness, and freedom. Human 'well-being' entails developing the full spectrum of these needs, within a broad range of culturally determined 'satisfiers'. Unlike the narrow, 'development as industrialisation and economic growth' perspective, the concept of 'development as meeting basic human needs' can embrace a broad range of different cultural perspectives and ways of 'developing'.

Box 4. In African culture, ethics and the importance of inter-relatedness to all living beings is conveyed primarily through folklore, with narratives cantered around the teaching of morality.

As an example of this narrative approach, Bujo (2009) recounts the Evu – Manu myth.

Evu – Manu myth

In this tale, evil is symbolized by a woman who is not able to catch any fish. On the way home, despondent from her failed fishing excursion and with her family facing hunger, the woman runs into a monster who gives her a dead animal with which to feed her family. The women gratefully takes the monster home, hoping that he will provide for her, only to find that the monster has an insatiable appetite. The monster gradually devours everything in the village, including the women herself.

The moral of the story is that human greed and blind confidence that anything can be achieved, however unnatural, will lead to a destruction of self, community and of the cosmos. Wisdom entails distinction between those elements that promote life, and those that destroy it. Bujo translates the tale as being a warning against too quickly absorbing the community destroying, corrupting, greedy and foreign ideas of western developmentalism (Bujo,2009 :285).

2.3/7 Cultural values and property use

One example that invokes debate around relationships between cultural value systems, world views and property use rights is Hardin's (1968) 'Tragedy of the Commons'. Hardin's argument, that open use of commons inevitably ends up in resource over-exploitation as each person attempts to maximise their own benefit from the commons, is popularly invoked to promote privatization of commons. Yet Appell (1993) points out that flaws in Hardin's understanding of commons management include a failure to distinguish between types of property systems, or acknowledge diverse usufruct arrangements and common property management systems instigated by various societies to prevent the occurrence of 'a tragedy of commons', and that the idea of property ownership is related to cultural world views. Wade's (1987) findings, that the ability to manage common resources amongst rural villagers in India varies widely in different communities, raises questions about the institutional arrangements that give rise to success in communal resource management. Wade found that villages most likely to succeed in communal resource management had a strong communal identity, placed high regard on social appearances and on maintaining social bonds, recognised the importance of maintaining the commons, were knowledgeable about sustainable use, consisted of small cohesive groups, employed sophisticated arrangements for discussion about commons management, considered the resource important for survival, were bound by strong codes of mutual obligation and imposed clear and enforceable punishments for breaking the rules. In addition, the commons were

small and had clearly defined boundaries, were situated in close proximity to users, cheating was easily detected, and influential role-players saw powerful benefits to maintaining the commons.

Table 1. Comparison between Complexity Theory, Ubuntu/Ukama, Deep Ecology and Reductionism.
Compiled by Valerie Payn

Complexity	Ubuntu/ Ukama	Deep Ecology	Reductionism
Relationships and complexity	Holistic view	Holistic view	Dissection
Inter-connection between all elements through feedback loops	Inter-connection between individual, community, the natural environment and the cosmos.	Deep inter-connections between human and natural world through ecological relationships	Separation between all parts, including humans and nature
History an important component of present structure and identity	Past, present and future are inter-twined.	Inter-generational equity and continuance	Disconnection between past, present, future
Openness and indistinct boundaries	No division between biological, social, and metaphysical.	Perception affects our metaphysical relationship to Earth	Complete objectivity is possible
Self generation and self – regulation drive adaption and evolution	Creation a manifestation of God. All linked in the cosmos	Earth as a complex, living system	Earth as a machine of individual parts
Emergence of new properties as a consequence of human/ nature interaction	Natural world has power over Humans. Human actions can disturb natural world, with adverse consequences	What happens in nature can affect humans and vice-versa	Humans are separate from Nature
Small causes can have large effects, no hierarchy	Egalitarianism - no sharp distinction between Humans and other forms of existence.	Egalitarianism. Humans are not more important than biotic realm	Hierarchy, different levels of development. Humans at higher level than Nature
Maintenance of identity requires an ability for suitable adaptation	Harmony and self-realization is achieved through holistic good relations with all of existence.	Harmony and self – realisation achieved through 'Ecological wisdom'	Self realization through achieving individual aspirations

Evolution a progressive consequence of emergence	An evolving sense of becoming	Achieving 'Self –realisation' involves ever deepening awareness of 'Ecological wisdom'.	Wisdom and truth can be obtained through objective enquiry and pursuit of knowledge.
Adaptation requires appropriate 'reading' of changes in the environment	Wisdom involves broad considerations of all factors and appropriate response	Ecological wisdom requires a holistic perspective	Understanding through reduction to simplified, fundamental basics
Too much change too fast can dissipate identity and cause dissolution.	A soft, cautious approach that emphasizes maintaining inter-generational continuity.	Decisions require respecting Earth systems and all of life, cautionary approach	Decisions require objective knowledge and truth
Paradox and uncertainty. Multiple realities	Simultaneous, metaphorical identity. Something can be more than one thing at once.		Absolute certainty. There is only one truth
A scientific language Knowledge through understanding feedback loops and emergence	*A symbolic language* Wisdom imparted through myth and folklore.	An ecological language Wisdom through awareness of ecological relationships	A scientific language Knowledge through pure science.
Sources: Cilliers, 2000; Clayton and Radcliffe, 1996; Capra,2003; Harding, 2006; Morin, 1992.	Sources:- Bujo, 2009; Murove, 2009.	Sources; Naess, 1999; Harding, nd; Capra, 1996	Sources: Pepper, 1999 ; O Riordan, 1999.

2.3/ 8 The South African Situation

Since the 1994 democratic elections, debates on property regimes have been central to the South African agricultural developmental debate. South Africa's diversity of cultures and history has left a legacy of both communal and private property ownership systems, in conjunction with deep socio-economic and political inequalities. These deep economic divisions led former President Thabo Mbeki to popularise the idea of South Africa consisting of two economies, namely a modern, wealthy, industrial 'developed' economic sector and a 'third world' economy characterized by poverty and under development, with the challenge of democratic development being to integrate the two economies (Cousins, 2007).

Cousins (2007) challenges this conceptualization, arguing that the structural framework of South Africa consists of one economy, where the 'depth of corporate penetration of the economy as a whole' (Andries du Toit (2004) as quoted in Cousins (2005): 5), is the prevailing cause of inequalities. From this perspective, Cousins argues that current attempts at agrarian reform and poverty alleviation that focus on market related methods of land distribution, land tenure and 'the creation of a new class of commercial farmers' (Cousins, ibid: 5) are insufficient to meet the needs of the rural poor or result in widespread poverty alleviation. Solutions require deep structural transformations, including a restructuring of the agrarian political economy and the integration of agrarian development with broader programmes of rural development. In Cousin's view, primary hurdles to this transformation include the lobbying power of commercial agriculture and widespread political and economic beliefs that "only commercial agriculture is real agriculture" (Cousins, 2005:7), that subsistence farming is 'under-developed', inefficient and unproductive, that many small scale land tenants have no aspirations to be farmers, that communal tenure systems discourage farming as they do not provide security of tenure or provide collateral for bank loans, that economic development requires a shift from agrarian based societies to urban industrial societies, and that appropriate agrarian reform should be aimed at de-racialising commercial agriculture and easing entry into commercial agriculture for market orientated small scale producers. Although many of these issues also touch on debates around land reform, the limits of this thesis preclude me from engaging with these (Cousins, 2005; Bernstein, 2005; Hall and Ntebeza, 2007). Cousins (2005) points to unfavourable terms of trade, and the influences of increased dependence on consumptive items, rising prices, high unemployment, and agricultural economies that prohibit agriculture from being the sole source of survival, as a factor that have led to many small scale farmers shifting out of commercial agriculture as a primary livelihood into multiple and hybrid non-agricultural income producing activities (Cousins, 2005: 9).

2.3/9 Chapter Summary

In conclusion, this Literary Review has examined the role of Agroecology in formulating a complex understanding of agrarian landscapes and agrarian practice.

From the perspective of Theories of Complexity, agrarian landscapes may be seen as complex and dynamic systems made of many interacting elements that influence each other, including human and ecological influences.

The way humans use and perceive landscapes is culturally determined, and can change over time. If change reduces landscape diversity, it can have adverse consequences for the resilience of human societies and the ecologies they depend upon. In traditional agrarian landscapes, interconnections between culture, ecology and agricultural practices gives rise to the emergence of unique landscape characteristics. Traditional landscapes slow evolution over time has allowed symbiotic relationship to

develop between indigenous cultural systems and ecological systems. Maintaining traditional landscapes requires maintaining those cultural traits that have helped to shape the landscape. Yet, a cultural tendency to interpret the environment according particular culturally determined knowledge paradigms has led to the misunderstanding of many traditional landscapes and agrarian systems by westerners, and to the imposition of inappropriate development.

Modern trends in agricultural practice have seen widespread conversion of diverse traditional systems of agriculture into 'one size fits all' "Green Revolution" systems of agriculture. This tendency has resulted in a loss of cultural, agrarian and biological diversity. Although there have been some benefits of "Green Revolution" practices, such as increased yields in some crops, the adverse ecological and social impacts of "Green Revolution" practices have lead critics to call for more holistic approaches to agricultural development that recognise interrelationships between culture, agriculture and ecology.

The following research study on Pondoland, covered in Chapters Three, Four, Five and Six, support views such as those of Pretty (2008), Norberg Hodge (2000), Altierei (1989), Naveh (1995), Antrop (2005) and Holthaus (2008) that call for more holistic, culturally aware and integrated approaches to agricultural development, conservation and land use than has generally been the development norm to date. The Historical Introduction to Pondoland (Chapter Three) suggests that narrow 'Green Revolution' approaches to agriculture have undermined local agrarian culture and traditions in Pondoland in a number of ways. These include the exclusion of small scale farmers in the formal agrarian economy through competitive price undercutting and limited market access, the failure to properly recognise the technological and economic restraints that affect small scale traditional farmers, a failure to take into account the importance of local cultural mores, values and traditions in perpetuating local agrarian practices, a failure to recognise and give validity to the important role of women in traditional amaMpondo agrarian production and household food provision, and a failure to recognise and give validity to local indigenous knowledge systems, social institutions and traditions. Within the South African context, the reductionist failures of the 'Green Revolution' approach have been compounded by the historical legacy of colonialism and apartheid. Colonial and apartheid policies both deliberately and inadvertently undermined local cultural systems, with implications for local agricultural production. Close inter-connections between traditional amaMpondo culture and traditional agrarian practices have meant that the undermining of cultural traditions and mores related to agrarian production has negative implications for local agrarian production, and changes to agrarian production have also had socio-cultural repercussions. The research and analysis of contemporary land use practices and local amaMpondo agrarian culture (Chapters Four, Five, Six) supports the findings of the historical overview. That is, there is still a strong relationship between cultural systems and agrarian practices amongst traditional amaMpondo farmers. This means that in those communities

where traditional cultural value systems and support systems for agriculture have declined, then agricultural production has also been adversely affected. These findings suggest that agricultural production and land use amongst amaMpondo traditional farmers cannot be disconnected from an understanding of local culture. The Pondoland case study that follows highlights the necessity for understanding the relationships between culture, land use and agriculture if sustainable solutions to food security and landscape conservation are to be found. This requires holistic approaches and the adoption of philosophies and ethics that recognise the shortcomings of reductionism, and see humans as being part of a broader social and ecological community of living beings.

With this in mind, the following Chapters provide in-depth research, analysis and commentary on Pondoland as a case study.

CHAPTER THREE: HISTORICAL INTRODUCTION TO PONDOLAND AS A CASE STUDY

Figure 5. Pondoland's Wild Coast, looking South toward Mbotyi from the vicinity of Egosa fault

Ch.3. Section 1: Historical background

3.1/1 Current Regional Development Policy

Currently, regional government emphasis on development in Pondoland reflects South African government policy. This is based on a modernist, 'mainstream' economically centred view of development stressing neo-liberal economic principles. Emphasises is on economic development that makes efficient use of natural resources, stimulating private investment, small and medium business enterprise (SMME's) development and the development of export orientated growth in order to realize economic capital, education and skills development. Key sectors of focus include capacity building in agriculture, food processing, manufacturing and agro-forestry. Agriculture's low contribution to GDP (9%) and low employment in agriculture (less than 2%) is cited as a concern. An externally dependent economy and the historical destruction of the indigenous traditional economy are mentioned as reasons for the regions current economic status (Wild-Coast SDI).Despite a long history of state emphasise on 'modernising' the regions agricultural potential, which to date has involved implementing variations of 'Green Revolution' agricultural strategies through intense

mechanisation, monoculture production, high external input agriculture and 'top down' specialist input, these heavily state sponsored schemes have, in general, exhibited a dramatic history of social and economic failure (Manona, 2005; McAllister, 1992; Beinart, 2000)

3.1/2 Early History

Although pre-colonial knowledge of the region is sparse, oral traditions and early European accounts suggest that at least from the 1500's, and possibly from much earlier, the Wild Coast was inhabited by settled, ordered and self-sufficient agrarian societies who practiced both agronomy and pastoralism, and had an abundance in both variety and quantity of livestock and crops (Swart, 2009; Wilson, 1959) Anecdotal reports from the 1500's from surviving European castaways wrecked along the East Coast suggest an extensively populated region, particularly just inland of the coastal belt, with indigenous cultures under the control of 'Inkosis' keeping large numbers of goats, cattle, sheep and growing a variety of crops (Swartz, 2009; Wilson, 1959). A 1635 shipwreck survivor wrote of a culture where the women do all the agricultural work, growing millet, maize, beans, melons, sugar canes and gourds of many kinds, as well other crops unknown to Europeans, including underground roots and seeds, and where cattle play a central role in the political economy of the society (Wilson, 1959). Reports of cultures living in the region included '*Mapontemousse'* (Mpondomise) and '*Maponte*' (Mpondo) (Crampton, 2004). Crampton (2004), in her genealogy of the history and influence of early ship wreck castaways along the Wild Coast, makes several references to the self-sufficiency and food abundance amongst the Bantu people of the area between the 16C and 17C.

In 1781 the Boer Jacob van Reenen wrote about seeing the gardens of the Tshomane (a kinship clan of the amaMpondo) on the banks of the Mngazana River. These consisted of 'very extensive and handsome gardens, planted with kaffer corn, maize, sugar canes, plantains, potatoes, black beans and many other things: they also have some cattle" (Crampton, 2004; 133). Crampton (2004) suggests that the extensive variety of crops that were grown might be a consequence of the influence of castaways from numerous nationalities who had become integrated with local people. Yet the apparent existence of non-indigenous crops such as maize, pumpkins, sugar-cane and potatoes might also be explained by African trade with Arabia and Asia (Swartz, 2009) and by the slave trade with the America's, which was well established between Africa, Europe and the South America's by 1576 (Crampton, 2004).

Beinart and Coates (1995) suggest that the Portuguese may have been instrumental in transferring the 'corns, beans and squash' agricultural complex to Africa, and that this 'enormously facilitated the expansion of African agriculture' (Beinart and Coates, 1995; 1078-85).

3.1/3 Historical Social Structure of Traditional amaMpondo Society

Traditionally, the amaMpondo were polygamous and lived in close, extended family groups. A typical umzi (homestead), would consist of a number of close dwellings occupied by a senior man, his wives and children, his married sons and their wives and children, and unmarried daughters. All married adults in the homestead were considered equally a 'father' or 'mother' to all the children, and all offspring related by kinship ties were considered 'brother' or 'sister'. This means the traditional Mpondo notion of mother, father, sister or brother encompasses a much broader notion of relatedness than a European understanding of these terms, typically being used to denote seniority and kinship to all the members of an umzi, including grandparents, aunts, uncles, cousins and in-laws, rather than close genetic relatedness. I suggest this broad notion of kinship is in keeping with Ubuntu's notions of broad relatedness of all humanity.

In traditional Mpondo society each umzi would owe an allegiance to a local 'Inkosi' (Chief), who in turn would owe allegiance to a hereditary King or Paramount Chief.

> "Each chiefdom consisted of a number of local communities bound by kinship and marriage, its size depending on the chief's (and his councillors ('amaphakati')) - ability to govern well. Supporters tended to vote with their feet, so that despotic, stingy or inept chiefs invariably lost their followers to wealthier and more benevolent rivals" (Crampton, 2004; 133).

Traditionally amaMpondo society
> "was very conservative....It was a community in which everything and everyone, particularly the women, knew their place, a system designed to maximise social stability by putting the good of the community first, rather than the needs of any individual" (Crampton, 2004: 26).

Beinart (1982) points out that traditionally, polygamy and the extended family played an important role in agrarian production amongst the amaMpondo, with the umzi being the principle unit of economic production. As the everyday running of an 'umzi' was principally relegated to women, who undertook much of the planting, hoeing, harvesting and processing of food, childcare, the care of small livestock such as poultry and pigs, craft manufacture of household goods such as sleeping mats and storage baskets, and well as the gathering of wild resources such as firewood, building materials and water collection, women formed an essential component in the food provision and economic welfare of an 'umzi'. In a fairly egalitarian, non-monetary society where a households self-sufficiency was a necessity for survival, the acquisition of many wives meant that the labour distribution of

chores could be spread and an 'umzi' could increase its agricultural output, so ensuring a better chance of survival and well-being for all its inhabitants (Beinart; 1982; Beinart; 1979).

If women were the principle agriculturalists, the care of the livestock, most notably cattle, was considered a man's portfolio. Poland et al (2003) observes that amongst the Nguni Bantu, an intense symbolic relationship exists between an 'umzi'[13] and their cattle. Cattle are central to the traditional social, spiritual, ritual and economic arrangements of the Bantu. The cattle byre is considered a sacred place, and a spiritual force is believed to connect the male head of an umzi to his cattle. Like the humans inhabiting an umzi, an umzi's cattle are considered to have a genealogy stretching back to a descent group of forebears. "In a very real sense household and herd are one, they constitute a single community" (Poland et al, 2003; 23). In ritual, sacrificial cattle help form a link between the current living and the Ancestral Spirits, the guardians of propriety, tradition and household well-being, who formed an important and (mostly) benevolent component of household and clan affairs. The value of cattle means that they are seldom slaughtered except in ritual, to which occasions the extended community are invited, helping to cement communal ties, and traditionally enabling the sharing of a rare source of protein amongst the community (Poland et al, 2003). Besides having ritualistic and spiritual associations with an ancestral past, cattle also imposed social status upon the owner. A man's social status was closely linked to the number of cattle he owned (Beinart, 1979; Poland et al, 2003). With marriage requiring the payment 'lobola', a gift of cattle from the groom's family to the prospective bride's family, a man without cattle could not marry. Lobola was considered a compensation for the loss of a daughter to her parent's umzi, as well as signifying the added value a wife and the children she would bear brought to her husband's umzi (Beinart, 1979; Poland et al, 2003; Timmerman, 2004). Cattle also have numerous practical purposes, providing protein through milk, leather for clothing, utensils and ornament, draught power, and manure for fertiliser, fuel, and the plastering of household interiors (Poland, 2003; Beinart, 1979).

3.1/4 'Joyini Inkomo'

In a study of the impacts of the migrant labour system in Pondoland at the end of the 19C, Beinart (1979) highlights the central importance of cattle to the traditional amaMpondo way of life. Of all the Bantu people, migrant amaMpondo labourers were renowned for preferring payment for migrant labour in the form of advance payments in cattle, rather than monetary wages, under a local contract labour system known as '*Joyini Inkomo'*. This despite the fact that endemic over-pricing of cattle by labour brokers meant that migrant labourers participating in '*Joyini Inkomo'* were regularly short changed their due wages.

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[13] Zulu spelling of umzi

Beinart (1979) explains this apparently peculiar Mpondo[14] preference in terms of the context of rural amaMpondo households at that time. As the majority of agricultural field work was undertaken by women, and as families still lived in large extended family groups, the labour of a percentage of young men in the community could be spared. The draught power of cattle combined with the introduction of ploughs greatly extended the agricultural capacity of amaMpondo households, but local herds were decimated by an outbreak of Rinderpest in 1897 and East Coast Fever in 1910. Trading young men's' labour for cattle for the umzi was a local solution to rebuilding the vital herds. In addition, the advance payment of cattle provided an incentive for young men to return home after their labour contract expired, prevented young men from squandering wages on the city life, and meant that 'interest' could be earned for an umzi if cows produced calves, doubling the value of the initial payment.

Beinart (1979; 1982) corroborates his argument by pointing out that prior to the Rinderpest outbreak, the agrarian self-sufficiency and the relative political independence of Pondoland meant that few amaMpondo had taken up migrant labour, despite efforts at enticement by increasingly industrializing South African commercial, mining and agricultural sectors, but labour vibrancy from Pondoland doubled in the years following the Rinderpest. Although *Joyini Inkomo* was defended by local European traders who were the chief labour brokers, as well as by migrant labourers who participated in the system, it was abolished by government authorities in 1910 under the argument that it was exploitative and that the extensive bartering of cattle in Pondoland as a consequence of *Joyini Inkomo* contributed to the spread of cattle diseases (Beinart, 2000, Beinart, 1979; Beinart 1982).

The continuing central economic importance of cattle to the traditional agrarian system of the amaMpondo is highlighted by a study by Heron (1991) who found that the most important variable in determining a household's maize yields is access to cattle, which provide draught power and manure for fertiliser.

Although migrancy and *Joyini Inkomo* appeared to have had immediate positive effects on the rural Pondoland economy, with amaMpondo initially using the migrant labour system to re-invest in the local rural economy and boost local agricultural production so that excess agricultural output from Pondoland in the first decades of the 20C was sufficient to establish a local export trade in many crops and cattle, the long term effects were more insidious (Beinart, 1982). Prior to the influences of colonization and commoditization, the exchange of goods in the Mpondo economy had been largely based on a reciprocal system of local exchange involving complex social codes of communal beneficiation and mutual obligation. Although commodity exchange occurred between umzi who

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[14] Mpondo - Noun for name of the culture.

   amaMpondo – plural version denoting the collective people of Mpondo, or their collective activities or belongings.

traded both skills and goods, it was particularly notable between Chiefs and umzi. Common practice was for Chiefs to loan out cattle to households in need, in exchange for certain obligations. While the cattle loan system enabled Chiefs to maintain some vestige of control over the independent umzi, it also enabled poor umzi to satisfy their basic economic production and social needs, and to increase their wealth through retaining a percentage of the cattle offspring once the cattle were returned (Beinart, 1982; Beinart, 1979). By 1866, opportunities of increased trade with European settlers saw 'thousands' of cattle and hides exported out of Pondoland. Mpondo draught oxen were re-known for their hardiness amongst colonial settlers, while maize assumed a central importance in the local export economy. The introduction of ploughs in the 1870's greatly increased the arable capacity of amaMpondo society, but also shifted agricultural dependence onto a need for draught animals. As cattle were traditionally the preserve of men, rather than women, one might question whether this changed the economic and social relationships between men and women. Yet, although women had traditionally been the primary agriculturalists, men had never been completely excluded. As cattle were an integral part of the society's social and agrarian structure one might argue men's traditional portfolio as pastoralists complimented the women's role of agriculturalists. Crop cultivation required input from cattle for draught power and fertilization, but cattle benefitted from the cultivation of crops in that crop residues provided cattle feed.

In addition, the practice of 'ilima' (see Box 5) involved extensive community participation by both men and women in urgent and labour intensive tasks. Although 'ilima' were essential for extensive agricultural production and so formed an important economic component in Mpondo lifestyles, they were also highly valued as occasions for socialization, communal gathering and participation in the sharing of food and drink through feasting. The primary incentive for participants is stated as an opportunity for socialization and feasting, 'a social occasion'. Ilima, then, not only had a practical economic function, but also served to strengthen the bonds of communality, kinship, custom and tradition, and sense of communal achievement and sharing. Communal socialising, feasting, dancing, music making and story-telling through song and dance were an important part of the ritual.

However, over time increasing commoditization wrought changes to the internal social and political structure of amaMpondo society. The migrant labour system loosened the tight bonds that had held large extended families together, and tensions over wages and cattle ownership meant sons were increasingly likely to split from the extended family group to form their own nuclear umzi. With smaller households, there were less hands to share agricultural work. The resultant reduced household self-sufficiency increased dependency on males as employed breadwinners, creating a rising dependence the wages and remittances of an industrialising South Africa (Beinart, 1982).

Box 5. "Ilima" and "Isithebe"

A contemporary description of ilima provided by an elderly Mpondo. Ntafufu, June 2010.

Ilima is a community practice where everybody comes together to help with hard tasks. The sharing of food and socialization is the incentive for people to be involved in ilima. It is a social and community occasion. It is organized by a community leader, an 'Umbizwa', (Person who Calls) who is asked to put together an ilima on behalf of those needing the work done. An Umbizwa is usually a mature man who is respected by people in the community and known to be good at organizing. The 'Umbizwa' invites people to be involved in ilima, sets the pace of the work, decides what is needed to be done and by whom, makes sure everybody participates in the work and nobody shirks, and shares out the food at the feast afterwards. Although people are invited to join, people can also volunteer to be part of the ilima and just join in if they wish. Traditional beer is an important incentive to people to be part of ilima.

At the feast afterward, which is provided by those who requested the ilima, people celebrate by eating in groups called "Izithebe'. 'Izithebe' is a social group for the sharing out of food. Izithebe also mean 'food platter' and is the name of the woven grass mat that traditional food such as meat, sweet potatoes, boiled mealies, amadumbe are served on. Whenever there is a celebration in the village, people commonly eat in the same 'Izithebe'. People who share the 'Izithebe' also have other things in common, such as age or kinship.

Besides being a way of getting heavy tasks done, Ilima is also a merry social occasion that encourages a sense of belonging to a community and of that community achieving.

If it is a large ilima, cattle will be killed at the feast for meat. At a small ilima, goats or pigs will be killed. Nowadays, ilima are not often very big, so pigs and goats are more popular.

In 'Ilima' spans of oxen are traditionally used to bring the harvest back home. Traditional maize beer is brewed and daughters and daughters- in- law are given the task of brewing the beer. At the feast, people compose and sing songs about the tasks they have done. The men dance and imitate how their lead cattle in the spans performed, by using their arms and hands to show how the lead oxen's horns moved. So the men show off how well their oxen performed in the spans. If you do not have oxen, you can't dance with you arms above your head because you do not have 'horns', you have to dance with your arms by your side. This is why men like to have cattle with horns".

Figure 6. Traditional Nguni cattle with valued horns on the Luplatana plains. Horned cattle are particularly valued by men, who increase their social status by mirroring the behaviour of their horned cattle in dances performed at ilima.

Box 6. The Social Importance of Song

Narrative by Nokwanda, a gifted singer. Bio-cultural mapping workshop.

In Mpondo culture, songs are very important as a way of communicating what people are thinking or feeling, or for communicating things that are difficult to talk about.

We make up songs to tell about important things happening in the community. For instance, if a man has taken a new mistress and deserted his wife, people might sing a song about a man who cannot be trusted because he has betrayed his wife. When the man hears people singing the song, he will be ashamed because he will know the song is about him. We sing about things we have achieved, our problems and people who have let us down.

A good song maker will take a tune that everyone knows, and put new words to it that are relevant to what is happening in the community. If people like the song, they will take it up. So our songs are always changing and telling about what is important to people in the community and what they feel about issues.

Yet internal changes to amaMpondo society cannot be seen as independent from increasingly adversarial colonial government policies towards native self-autonomy. Despite the apparent success of Pondoland's agrarian economy, by the 1930's it had become common for official and settler world –views to denigrate African methods of farming as careless, inefficient, unproductive and ecologically degrading. Indigenous pastoral systems where criticized for over-stocking that lead to over-grazing, while local practices involving shifting cultivation, continuous planting, and the widespread use of ox-

drawn sleighs were criticised as being conducive to soil erosion and land degradation (Beinart and Coates; 1995, Beinart, 2000, Beinart, 1982). Beinart (2000) argues that these perceptions were highly influenced by conservationist awareness and attempts to mitigate the ecologically degrading consequences of settler farming in the USA, and arid regions of Southern Africa. Notwithstanding real lack of evidence that African farming methods were degenerative, these viewpoints became a pretext for numerous 'agricultural modernisation' and 'conservation' intervention schemes in rural African ways of life and led to widespread interventions in rural ways of life (Beinart, 2000; Beinart and Coates, 1995).

In addition, annexation by the British Colonial government in 1894 had brought an increasing series of taxations, including a 'hut tax' imposed on married men for each hut, necessitating an increasing need for external sources of revenue. It is conceivable that this and the wide influence of Christianity also led to declining polygamous practices. In the years following World War 2 local maize production was undermined by competition from the industrial 'Green Revolution' expansion of the maize industry amongst European farmers in the Orange Free State and Transvaal. This competition depressed maize prices and saw traditional Mpondo varieties of maize fall out of market favour, while government restrictions on local cattle exports and haulage by cattle limited Mpondo access to external markets (Beinart, 2000; Beinart, 1982).

From annexation onwards, Beinart (1982; 2000) describes a rural society that became increasingly suspicious of European motivations, as European development agenda's increasingly impinged on local autonomy. Threats of insurrection against reformist Chiefs, such as Mhlangaso in the 1890's, whose support for 'progressive' policies and a modernisation agenda was seen as 'selling out' the interests of common people, followed attempts to impose policies that threatened common rights of access to communal resources (Beinart, 1982). Beinart (1982) elaborates that these included the rejection of the 1894 Glen Grey Act which imposed a labour taxation in Xhosa males to force them into labour employment and intended to replace communal land tenure with individual tenure. The fencing of grazing land, compulsory dipping programmes, and the introduction of new 'modern' agricultural methods through extension services were commonly rejected as being pretexts for more government interventions in local life, unsuitable for local conditions and an imposition on preferred indigenous practices (Beinart, 2000). Mpondo farmers often had good reason to view European interventions with suspicion. Although 'modern' methods did apparently improve yields, implementation of these practices often exceeded the resources available to poor households. Implements were expensive and presumed the availability of draught animals throughout the year, and recommend practices did not take account of the wisdom of other traditional customs.

"Winter Fallowing interfered with grazing patterns and, by removing the weed
and stubble cover, increased susceptibility to erosion. Investment of more cash
in agriculture did not necessarily bring commensurate returns, especially when
it was difficult to market crops for cash" (Beinart, 1982; 88).

Compulsory dipping was locally blamed for facilitating the spread of disease as normally isolated
local herds were brought together for dipping, and long treks to dipping tanks were blamed for
weakening cattle, making them unsuitable for draught (Beinart, 2000).

3.1/5 'Betterment planning'

The recommendations of the Tomlinson Commission (1955), following the precedent set by
Proclamation 31 in 1939, set the scene for the introduction of 'Betterment Planning' in the Bantu
areas of Eastern Cape. Although 'Betterment Planning' was intended to promote land conservation
practices and more efficient use of agricultural land, there is scant evidence that either conservation or
agricultural objectives were achieved, and 'Betterment' later became associated with apartheid
attempts to control rural populations and ensure cheap migrant labour (Beinart, 2000; McAllister,
1992).

Under 'Betterment', rural people were coerced to abandon the traditional, flexible, dispersed spatial
spread of umzi, and corralled into close European- like villages. Limits were put on the number of
livestock a household might have and livestock movements were restricted to demarcated, often
fenced areas. These actions did not take cognisance of traditional customary practices in which cattle
herding on commonage by young men was considered a cultural rite of passage, ownership of cattle
was associated with wealth and status, and seasonal migrations of livestock to winter grazing areas
such as the Lambazi plains along the coast helped mitigate against overgrazing. Under 'Betterment'
strict control of livestock movements and the increased settlement density in 'Betterment' villages
exacerbated overgrazing (Beinart, 1982).

Under the traditional system, arable lands are granted under usufruct to umzi by the consent of the
local village headman after consultation with other villagers and the local Inkosi (Chief), and are
granted on the basis of household need. An umzi retains the usufruct to its granted fields as long as it
has need of them and as long as it is utilizing them. If utilization falls away for an extended period,
then so does the usufruct. In 'Betterment' villages land was demarcated into arable lands, residential
areas, and grazing commonage based on pre-determined economic units. Individual lots consisted of
0.2 hectares of arable land, and were granted on a one man, one lot basis. The radical social and
spatial re-organisation of traditional structures that 'Betterment' brought about resulted in significant

changes to agricultural practices. A combination of land shortage and population pressures saw far flung fields being abandoned in favour of closer, smaller 'gardens'. Consequently many distant arable lands lay unused, or were converted into grazing (Ngcaba, 2002; McAllister; 1992). Betterment also saw a significant decline in livestock numbers (Andrew's, 1992 quoted in Manona, 2005).

McAllister (1992) outlines the key socio-economic impacts of 'Betterment' as being a reduction in agricultural development and consequence economic impoverishment due to relocation into villages, loss of local autonomy accompanied by increasingly authoritarian control and regulation, intense social disruption as people found themselves dislocated from the communities and communal structures they had grown up with and a consequent increase in social conflicts, loss of land use flexibility, and deteriorating ecological conditions. Concentrated settlement and the breakdown of traditional land management structures and flexible land use systems often led to an increase in erosion and overgrazing around 'Betterment' villages, while water and other natural resources in the vicinity were often over-exploited.

Figure 7. Cutweni (Khutweni), a 'Betterment' village.

In Pondoland, local resistance against 'Betterment' was acute and culminated in rural insurrection known as *iKongo* or the Pondoland Revolt of 1960, which was violently suppressed by armed forces. Impetus for the rebellion appeared to be multifaceted, and included resistance to 'Betterment', to increasing government interference in local use of natural resources, and to the usurpation of traditional systems of governance by imposed authorities. Beinart argues that the Pondoland revolt represented "an outpouring of anger against external rule which had transformed African societies and was now seen to threaten their surviving rural base" (Beinart, 2000: 76). Yet the lessons of 'Betterment', which warn against the successful imposition of authoritarian and culturally alien social engineering schemes in the name of 'development' and 'conservation' in Pondoland, do not seem to

have been heeded by the successions of government planning authorities that have followed since 1960.

According to McCallister (1992), the twenty year agricultural development strategy (1980 -2000) initiated during the apartheid era under The Transkei Agricultural Development Study, and aimed at promoting local food security and the economic independence of the former Republic of Transkei, makes the same flawed assumptions as the views that underpinned 'Betterment'. These include the perception that communal land ownership and agricultural development are incompatible, that there is a distinction between productive and unproductive farmers, that over-stocking has lead to overgrazing, that current agricultural practices are uneconomical and inefficient, and that those who own livestock benefit at the cost of those who do not.

3.1/7 Agrarian 'modernization' since 1981

Since 'Betterment', a number of ambitious agricultural 'modernisation' schemes have been initiated in the Pondoland region with the intention of boosting local economic development and food security. The success of these has been dismal. These have included Transkei Agricultural Corporation (TRACOR) initiated in 1981, the 2002 Massive Food Production Programme, and Ntinga or the O.R. Tambo Maize Programme (2001 – 2005). In a critique of these programmes Manona (2005) concludes that these schemes replicate earlier schemes designed to facilitate the functioning of apartheid. By focusing on arable fields, the schemes omitted the inclusion of the majority of people in the community, including many poor households. Focus on high yielding varieties, and the use of high external inputs, increased the costs of production and level of risk and made the programmes uneconomical unless exceptional yields were produced and sold at exceptional prices, while the use of monoculture and commercialization as a means of promoting food security through improved diet was questionable.

> "70 percent of the landowners admitting that they would not be able to produce maize in the same fashion on their own...the scheme promotes a shift in agricultural practices towards monoculture, which has a consequence of reducing variety of crops produced, which were produced through intercropping under the traditional system. If the quantity of maize produced is not significantly increased and the variety of crops is reduced, the schemes contribution to an improved diet is questionable. Africa has produced tons of maize well in excess of what the market can absorb. Conversely, the country is still facing serious poverty and food shortages by households, with poverty levels in the region of 80 percent within the study area. A similar situation is

also created by the maize scheme, where last year's maize purchased by Ntinga from landowners is still kept in silos, while the majority of local people need food for survival. What this is demonstrating is that one cannot rely on commercial markets and commercialization in the fight against poverty. This thesis has shown that while there is a role for government to play in supporting smallholder agriculture, this role has not been well defined by government as well as its agencies" (Manona: 148).

Characteristic of all these agricultural schemes was the imposition of 'Green Revolution' industrial agricultural production methods and philosophies on a pre-existing traditional agrarian system, which apparently went hand in hand with an apparent lack of understanding of local conditions and culture. The imposition of "Green Revolution" technology required the large scale importation of skills, equipment and knowledge and costly start up expenses. Lacking the requisite skills, knowledge, machinery and financial means to implement this new technology, local farmers were sidelined as participants. Minimal consultation, authoritarian attitudes, 'top down' planning, and political interference were the order of the day (Manona, 2005).

Although the schemes claimed to have provided a massive increase in the maize yield, Manona (2005) questions whether the production output could be justified in light of the high input costs and risk which, combined with a low maize price, ultimately made the schemes uneconomical. There were also non-economic costs to consider, such as the undermining of local knowledge and skills, the breakdown of local customs of reciprocity such as 'ilima' which underpinned traditional agricultural production, the creation of a culture of dependence on government assistance for agricultural production, the loss of local farmers locus of control over farming, with the control of the scheme vested with authorities and consultants rather than the farmers themselves, a loss of traditional crop diversity through monoculture, and an increase in risk as the traditional seasonal spread of a range of crops and plantings were replaced by a single planting of a monoculture crop (Manona, 2005). Manona (2005) also questions the assumptions that lay behind the inception and development of these schemes. As no baseline studies were done, it was impossible to accurately determine yield increases, and the schemes seemed to operate under the premise that it was desirable and possible to easily transfer highly scientific, technological, locally unfamiliar farming processes onto farmers using a minimum of skills training.

Civic society critics of agricultural development schemes such as the Massive Food Production Programme argue that such programmes are driven by an 'unholy alliance' between the vested interests of corporate agendas, bio-genetic science and government, rather than the real needs of rural agrarian communities (Bradfield, 2011)

3.1/8 Measuring Pondoland's productivity

On productivity, perhaps a central question is how productive are traditional agricultural practices? Shackleton *et al* (2000) argue that agricultural activities remain significantly important as part of communal livelihood strategies in South Africa with selective measurement criteria consistently undervaluing production. Others point out that the importance of agriculture for household's income seems to have steadily declined throughout the century , and in certain area's seems to have virtually collapsed with an increasing reliance on jobs, social security grants, remittances and food imports (Beinart, 1992; Cousins, 1999; Manona, 1989). Others point to a shift in local cultivation methods, away from large arable fields to a concentration on intense cultivation of gardens in close proximity to homesteads (McAllister,1992; Andrew et al; 2003) While McAllister (1992) argues that a combination of land shortage and population pressures has reduced the cultivation of arable lands, Andrew et al (2003) cites theft, security issues, convenience and lower production costs as contributors towards a preference for gardens.

A lack of comprehensive baseline data prevents any real establishment of the productivity of communal agriculture. My own observations in Pondoland are that different communities and households vary in their levels of production and commitment to agriculture, ranging from those who do very little farming or food gardening, to those who owe a substantial part of their livelihoods and food security to agricultural activities. In addition, if studies have been undertaken in 'Betterment' villages, traditional agricultural production in these areas has already been comprised through 'Betterment Planning'. Therefore any studies around productivity need to be contextualized within the particular socio-economic context and history of the community and household.

In addition, while some argue that the communal land system, with population pressure and its communal land tenure system, is incompatible with the investments that the development of a commercialized agricultural sector requires and that communal tenure inhibits the productive potential of households, (Sansom, 1974; Wood and Van Schoor, 1976; Bernstein, 2005) an important ethical question is whether the communal land tenure system can, and should, be considered out of whole socio-cultural context in which it originates. It is possible and desirable to reduce agricultural production in areas still practicing traditional farming methods to narrow arguments that centre on measures of yield and commercialisation as yardsticks for success? Is this not an imposition of those western ideologies that lead to a 'misunderstanding' of indigenous landscapes?

Holthaus (2008) argues that reducing the indigenous practices of traditionally subsistence cultures to the level of mere economic considerations misses the whole socio-cultural complex which gives meaning and vitality to indigenous ways of life, and that economic considerations cannot be considered separate elements from the world-views and value systems of any particular society. To

separate economics from particular society's values and world views is to miss the deeper significance that a particular way of life holds for a particular culture.

 In Holthaus's (2008) view, a subsistence or traditional culture is not just a level of economic existence, such as having enough to eat, but is related to an entire world view that gives meaning, identity and significance to the lives of people within the culture. Such a cultural identity transcends economics and involves "philosophy, ethics, religious belief and practice, art, ritual, ceremony and celebration, law, the development and adaptation of a variety of technologies, and an education system that will ensure the survival of the people" (Holthaus, 2008; 961), and that the gravest threat to traditional cultures is the withering away of cultural world-views and values, which results in loss of "knowledge and understanding inside the culture" (Holthaus, 2008; 843).

> "If a traditional culture lets go of the life that gives meaning to subsistence
> activities, then it has also let go of its own definition of subsistence and reduced
> it to an economic system" (Holthaus, 2008; 848).

3.1/9 Conclusion

This historical analysis of Pondoland raises a number of issues. The fact that increased agricultural production in Pondoland from the late 19C occurred spontaneously as a consequence of increased market opportunities, while external interventions from the 1920's onward appeared to undermine agricultural production although their stated purpose was supposed to achieve the opposite, highlights a number of things.

First, that amaMpondo agricultural practices had a capacity to be highly productive and responsive to market opportunities that presented themselves at the time, and that market failure as a consequence of larger events external to Pondoland played a significant role in depressing agricultural production.

Second, although many colonial policies were deliberately imposed to limit native autonomy, one might also argue that not all European motives could be construed as deliberately destructive or obstructionist. Many agricultural interventions geared towards 'modernisation' might be seen as attempts to convert traditional agricultural practices into a mirror image of 'modern' European based industrial agriculture, with 'Betterment' planning providing a prime example. 'Betterment' suggests the influence of a modernist, technocratic, reductionist perspective that failed to comprehend complex interrelationships between people, their culture, their agrarian production systems, and the environment of which they were a part. When viewed from this perspective, the modernisation and commercialisation attempts of agriculture in Pondoland might be viewed as the arrogant imposition of a particular, industrialized worldview on another culture's traditional world-view and knowledge base. In this sense, it amounts to the usurpation of a cultural identity. Besides the autocratic,

authoritarian and arrogant attitude towards indigenous agricultural systems which the term 'Betterment' itself implies, the remodeling of the landscape into ordered villages based on regulated fields and allotments suggests an attempt to emulate a familiar Eurocentric model of landscape and social structure onto a foreign land and culture.

Third, large scale resistance to 'modernisation' suggests that traditional ways of life offered benefits for local people that they could not see in the 'modernisation' agenda.

Fourth, that developmental change to agricultural practices in the region occurred as a consequence of complex and dynamic interactions between external and internal forces. The amaMpondo took advantage of 'development' when this offered them opportunities that were based on their own objectives, and fitted their socio-cultural value systems and organisation. Yet these opportunities themselves wrought internal changes to the society that affected the socio-cultural structure of the society and which had implications for agricultural production. The falling out of favour of polygamy and large extended families reduced an umzi's potential labour force which initiated an increased reliance on wages to meet the shortfall in productivity, yet an increase in external remittances reduced an umzi's reliance on agriculture as a prime means of survival.

A notable feature of the socio-economic, cultural and ecological impacts of 'Betterment' is that spatial re-organisation of traditional cultural landscape structures, socio-cultural breakdown, agricultural decline and ecological degradation were inter-related. In 'Betterment Planning', spatial rearrangement led to socio-cultural breakdown of the traditional systems that had underpinned the traditional agrarian system, leading to a decline in agricultural production, ecological degradation, and economic impoverishment. 'Betterment', if anything, exacerbated problems rather than generating sustainable solutions. Simultaneously, the impositions of external forces necessitate socio-cultural changes which the amaMpondo were forced to adapt for survival.

This more complex understanding shows a dynamic society adapting to changes it perceives to be favourable to itself, while vigorously trying to reject those it perceives as unfavourable to itself. In this process, both internally induced change and external change have affected the structure and socio-cultural dynamics of the society. These in turn have had implications for agricultural practices and production.

Although Manona (2005) questions the suitability of "Green Revolution" methods for the development of agriculture in Pondoland, and shows how the imposition of these has failed to meet local needs and clashed with local cultural systems, he does not pursue the question of what an appropriate agricultural approach would entail. I hope that the following case studies will help to fill

that gap by examining current amaMpondo agrarian practices and worldviews, and so provide greater insight into the contextual relationships between local perspectives and agricultural practices amongst amaMpondo traditional farmers.

CHAPTER 4. METHODOLOGY AND INDIVIDUAL CASE STUDIES

4. Section 1. Methodology

"All writers are propagandists. Writers who claim differently, or otherwise do not understand this, have succumbed to the extremely dangerous propaganda that narrative can be divorced from value" (Jensen. 2006:10).

4.1 Selection of Method for Research Purposes

Rather than providing quantifiable data or prediction, the aim of qualitative research is to seek experiential information. According to Corbin and Strauss (2008), qualitative research is helpful for raising questions and generating concepts useful for developing further research. Qualitative research is also useful for providing information that can generate new ways of thinking and provide insights into the way people behave. Rather than trying to produce certainty, it attempts to explore the rich and complex nuances of human experience and human perception of reality (Webster and Mertova, 2007). As the aim of qualitative research is to generate rich observational and contextual data, it typically adopts an informally structured, flexible approach in which the respondents can help set the agenda (Elliot, 2005).

Corbin and Strauss (2008) argue that post-modern, deconstructionist approaches to research recognise that human reactions to events are largely a consequence of the meaning humans give to those events. Meaning is derived through knowledge and interpretation, and these are affected by prevailing social knowledge, perspectives and perceptions. This gives qualitative research an inherently subjective quality, in which both researcher and researched become interpreters of, and participants in, creating a particular model of 'reality'. As the primary aim of this paper is to explore the relationships between the socio-cultural experience, perception, and the way these influence the particular agrarian and land use practices of amaMpondo farmers, this makes my thesis suitable for qualitative research.

In the human world, meaning and experience are largely conveyed through narrative. The stories people tell convey insights into how people understand and cope with issues in their lives, providing a rendition of how life is perceived (Corbin and Strauss, 2008; Webster and Mertova, 2007; Elliot, 2005)

Narrative enquiry can be useful for exploring the similarities and differences of underlying assumptions, concepts and premises of members of a group, or of different groups. While Webster and Mertova (2007) reason that a narrative approach requires an analytical examination of the underlying insights and assumptions within narrative, deconstructionist approaches emphasise the importance of letting people tell their own story, without interpretation (Elliot, 2005).

While I find the idea of a deconstructionist approach attractive, the interviews with amaMpondo traditional farmers have been conducted in isiXhosa[15], and although I am reasonably fluent in the language, I employed a translator to help paraphrase the more intricate details and nuances of the interviews. The act of translation itself is problematic for a deconstructionist approach, as some of the nuances of meaning can be lost in the translation. I also approach this thesis with a realization that my own socio- cultural history will have a bearing on the way I contextualize events, and translate narratives and 'landscape'. With this in mind, I do not take the normative scientific view that this thesis can be a totally objective exercise. My role as researcher and writer is to select and analyse those parts of narrative that I feel are most pertinent to this exercise, but this requires 'framing' which is subject to my own particular world view and objectives.

For practical reasons then, my research is a hybrid between an analytical and a deconstructionist narrative approach. I have included my own analytical observations where appropriate, but I have also drawn extensively on direct narratives to tell the local perspective. I have included these narratives in the text of this document using text boxes.

In addition, to try and corroborate local narratives with visual changes in agricultural land use and forest regeneration, I approached the Institute of Natural Resources (INR) at the University of Kwazulu-Natal to do a chronological assessment of land cover change from aerial photographs taken of the Ntafufu and Manteku areas in 1935, 1956, and 2008, which they agreed to do pro-bono. The full report of this exercise is contained in the Appendix.

4.2 Area of Study

This research has taken place amongst traditional amaMpondo farmers residing in rural communities within 10kms of the Pondoland coastline. The Pondoland coastline, traditionally, covers the area between Mthamvuna (Mtumvuna) River and Mthatha River. As the Pondoland Centre of Plant Endemism (PCE) falls within the 16km coastal zone, measured from the high water mark, all communities within this study area fall within the PCE.

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[15] isiXhosa- the language spoken by amaMpondo

Altogether, the research involved 63 participants drawn from 8 different communities. These communities collectively come from a geographical area stretching from the Mzamba river south of Port Edward, to the Ntafufu river north of Port St Johns.

A total of 39 farmers took part in the in-depth interviews, focus group discussions and on site field visits. The main areas of study for interviews, site visits and in-depth discussion were the community of Sigidi south of Port Edward, bounded by the Mzamba and Mpahlane[16] (Umphalani)[17] Rivers, and the communities of Mthambalala in the vicinity of Ntafufu (Mntafufu)[18] and Nonjonjo near Manteku River.

In depth interviews and on site field visits were conducted with 16 farmers from these communities. These consisted of 10 farmers from Sigidi, 3 from Mthambalala, and 3 from Nonjojo. In depth interviews involved a site visit to individual farmer's fields and homesteads, and discussions around individual farming practices. These interviews commonly took approximately 2 hours per participant. Focus group discussions, involving groups of farmers from particular communities, took an average of 3 hours with each group, and covered a wide range of topics pertaining to local land use practices and customs.

The bio-cultural mapping workshop involved 25 participants from 6 different communities. Communities that participated in the mapping workshop included Sigidi (historically referred to as Luphithini and marked as Vatyini on Slingby's Wild Coast map) Mdatya, Mtolani, Mpendweni (Empindweni), amaBaleni (Mabaleni) and Mtentu/Nyavini.

Further details of participant selection processes and participant details can be found at point references 4.2/2, Box 7, 4.2/3-1, and 4.2/4.

Although the research study area has not included all the communities living within the geographical area of the Pondoland Wild Coast between Port Edward and Port St John's, I believe the geographical spread of participants, and the number of communities from which participants are drawn, is sufficient to provide a representative sample of the perspectives and practices of amaMpondo traditional farmers living in the selected study region.

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[16] As spelt on Slingby's Wild Coast – The Map, second edition (www.themaps.co.za)

[17] As spelt by local population

[18] Note on spellings of place names. There is very little consistency in the spelling of certain local place names. Local spellings often differ from the spellings found on maps, official documents or road signs. Spellings on maps and documents also often differ from each other. Sometimes there are also several colloquial names for the same place. I put this down to the highly volatile history of the area, which has seen numerous cultural and political influences, with different cultures using different phonetic spellings and sometimes different names for the same place, and the strong oral cultural traditions of the Nguni people which meant that, until fairly recently, literacy was uncommon. Local people also seem to have a habit of giving nicknames to significant places. I have given common alternative spellings in brackets.

4.3 Sourcing of Information

 I have obtained the information for this thesis using a number of methods.

These include direct semi-structured interviews and in-depth discussions with individual farmers and focus groups, observation of practices obtained through field visits to individual communities and farmers where I observed local farming practices, and participation as an observer in a bio-cultural mapping workshop conducted under the auspices of the NGO Sustaining the Wild Coast (SWC), in which elected community representatives from six adjoining communities between Mzamba and Mtentu Rivers participated.

This information has been supplemented by numerous other formal and informal excursions to Pondoland's Wild Coast over six years that has helped inform my knowledge of the area and its inhabitants.

4.4 Semi-structured interviews and discussions

Following a deconstructionist approach, the 'interviews' took the form of semi-structured and open-ended discussions. Many of these interviews and discussion took place on site in the agricultural fields and homesteads of participants during field visits. Through this means I hoped to facilitate a process in farmers could become actively engaged in helping shape the issues under discussion, and which would allow deeper investigations and insights into the issues that arose.

I facilitated the discussions to cover the following broad areas of interest:

- Current agricultural practices,

- Social customs relating to agrarian practices.

- Changes in agricultural practice over generations, and what had brought these about.

- Differences in value, knowledge or agrarian customs between the different generations

- The perceived state of social relationships and support for agriculture within the respective communities, and whether these had changed over generations.

- Changes to the general state of the local environment that participants had noted, and what they felt had caused these changes.

- Agricultural ambitions, and perceived constraints affecting those ambitions.

-Other local beliefs relevant to people's perspectives about the landscape they inhabit.

I have collated these responses into collective commentaries which I hope will give direct insight into local perspectives and practices within different communities.

4.5 Excursions

These semi –structured interviews and discussions, and the information from the bio-cultural mapping workshop, have been supplemented by knowledge I have obtained during numerous other excursions to the area over 4 years that have given me an opportunity to observe and discuss local perspectives and agrarian practices with traditional farmers.

4.6 Presentation of Findings

My findings will be presented through a mosaic process that combines individual and group narratives, my own descriptive observations, and individual case studies. I will supplement my visual observations with photographs as photo-documentary research evidence, when applicable. I will present the Sigidi discussions and observations as a separate case study to the Mthambalala and Nonjojo discussions. This is based on my observations that, although there are some similarities of agrarian practice and community culture between the Sigidi community and Mthambalala/ Nonjojo, there are also notable differences that require attention and discussion. The bio-cultural mapping workshop will supplement these findings.

I have chosen this format in order to try and remain as true to the narratives of local people as possible, in order to reflect their perceptions and perspectives, while at the same time trying to recreate in documentary form the very visual and sensory experience that being in a particular socio-cultural landscape entails. At the same time, I am aware that through the act of writing this thesis, I am an external observer and narrator of other people's ways of life and that although I am not 'of the culture' I am the one contextualising the way of life.

4. Section 2: Individual Case Studies.

This section will present the findings from the individual case studies and interviews in the community of Sigidi and Nonjojo and Mthambalala that have informed my research. Although Nonjojo and Mthambalala are separate communities, I have collated the information from these communities together, as I have found many similarities of practice here.

4.2/1 Geological background

Given agroecology's (Altieri, 1989) emphasises on understanding the complex inter-relationships between socio-cultural factors, ecological factors and agrarian systems, I feel it is important to provide a brief summary of how the underlying geomorphology influences landscape forms along Pondoland's Wild Coast. Particularly as my research findings suggest that the region's geology has had an impact on the localised agricultural practices that have been adopted by different Mpondo communities.

Between Mtumvuna River and the Egosa fault line, the coastal geological structure is characterized by a sandstone layer composed of fossilized marine sediment, known as the Msikaba Formation. The Msikaba formation has generated a covering of dystrophic, shallow, sandy soils with high aluminium content, 'a weak structure, low moisture capacity and high permeability... with very little clay and mineral diversity' (De Villiers and Costello; 2006: 29). Through this predominantly flat landscape, deep gorges with almost vertical rock faces have been cut at regular intervals by the regions numerous rivers. These rivers are fed by numerous small tributaries. Grasslands dominate this section of the coastline, although thickets of sub-tropical forest are found in gorges, along the coastal dunes and in other scattered patches along the coastal escarpment. Some argue that these forests are remnants of much more extensive historical forests, but this is disputed by others who point to archaeological evidence suggesting grasslands domination for thousands of years (Kepe and Cousins, 2002). The unique conditions associated with the Mzikaba Formation have been accredited with creating the specific conditions that have given rise to the high number of site specific endemic plants that has lead to the Pondoland Centre of Plant Endemism being globally recognised as one of the world's 235 botanical 'hotspots'.

South of the Mzamba River, extending south to Mtentu, the area in close proximity to the coastline is marked by the red sand-dunes of The Berea Red Sand Formation, which cover the sandstone layers of the Msikaba formation and extend as far as 1.5kms inland and up to 80m high. Although these dunes are generally covered by vegetation, in places the dunes are exposed and these vegetation-less zones are colloquially called 'The Red Desert'.

Box 7. Local explanation for the Red Desert. Mzami Dlamini. May 2011

I asked Mzamo what local people believed caused The Red Desert.

"People who live around there say The Red Desert began when some women planted a field of sweet potatoes on the dunes. When the sweet potatoes where reaped, the soil was left bare and loose, and the wind blew away all the topsoil. That prevented any other vegetation from taking root, and was the beginning of The Red Desert".

A high water table and high average rainfall (approx 1000mm) create numerous wetlands and small streams within the area covered by the Msikaba formation, including within the dune zone.

The Egosa fault marks the end of the Msikaba Formation. South of the Egosa fault Mbotyi Conglomerate rests on Beaufort Group shales. This geological change marks a dramatic shift to the coastal landscape, vegetation and soil type. The predominantly flat grassland and ericaceous covered plateau of the Msikaba Formation give way to a tumultuously hilly landscape, covered in extensive stands of sub-tropical coastal forest interspersed with patches of grassland.

The coastal regions of Pondoland are characterised by a warm temperate climate and falls in the summer rainfall regions of Southern Africa. Prevailing winds blow in an Easterly and North – Westerly direction. The North- Westerly periodically reaches gale force proportions.

Average summer temperature	22.3C
Average Winter temperature	18C
Average mean annual humidity	74%.
Average rainfall	1200mm

4.2/2. Sigidi Case Study

4.2/2 -1. Landscape description of Sigidi.

As the crow flies, Sigidi is about 14kms South-West of the Kwazulu-Natal coastal town of Port Edward, from which it is geologically divided by the deep, unbridged gorge of the Mzamba River. Access by vehicle requires a long inland detour of about 40kms on mostly very rough dirt roads in order to circumnavigate the gorge (about 1.5hours journey).

Access by foot from Port Edward requires a walk of about 2 hours, including a steep climb down the gorge and up again, or a traverse along the beach, both of which require fording the Mzamba River.

Along the coast, a series of coastal dunes run parallel to the coastline. To the North a low stony escarpment separates the coastal plain from the upland regions. The West and Eastern sides of the community are bordered by the steep river ravines of the Mzamba and Mpahlane Rivers, which the Sigidi community use as demarcation of its boundaries. Lying on the shelf of the Msikaba formation which forms a coastal plain, the Sigidi landscape is relatively flat, rising steeply toward the coastal escarpment, and falling steeply into the river gorges the demarcate the community's boundaries.

Traditional round, thatched rondavals form the majority of dwellings, although some rectangular 'modern' buildings are beginning to make an appearance. Umzi in Sigidi are dispersed in a scattered

pattern in the grasslands, behind the dune formations that run parallel to the coastline. Umzi are sited at broad intervals ranging from 500m to 2kms apart. There are 81 umzi in the community, all of which are involved in agricultural activities. In Sigidi, many of the umzi are sited some distance from cultivated areas.

Figure 8. Traditional landscape of Sigidi, with traditional dispersed settlement patterns of umzi

The interviews and discussions at Sigidi were conducted in field as people worked, in September 2010. Although pre-arrangements had been made for the interviews, the farmers told me I had arrived during the busy planting season and they could not afford the time to stop working in order to talk to me, so I must talk with them as they worked. This gave me an opportunity to observe and discuss various farming practices as they were being undertaken.

Participation in the discussions was voluntary. The community had been given notification that I would be conducting research interviews, and an open invitation given to anyone interested to participate.

Box 7. Details of farmers interviewed and visited at Sigidi
A middle aged women, whose husband was tending the cattle and whose children were at school
A middle aged women and her grown son, tending the fields together.
An elderly man and his wife, who had numerous extended family members of many generations living with them in a large 'umzi'.
A middle aged women and her two young adult daughters, accompanied by two small grandchildren. Her husband was also tending the cattle and she said she had no sons.
A young adult couple, man and wife, tending the fields together.

4.2/2 – 2. Agricultural practices

Sigidi people make a distinction between 'fields' and 'gardens'. This distinction is related to the size of cultivated areas, cultivation practices, as well as the types of crops grown. Gardens are predominantly, although not exclusively, sited within low lying wetland zones between the dune formations, while fields are concentrated in flatter areas of the undulating coastal plain. If gardens are not within the wetland, the availability of a water source becomes an important consideration for the site. Sigidi gardens and arable fields are not necessarily placed in close proximity to homesteads. Fields and gardens tend to be clustered in the most fertile and accessible areas of the landscape. In the case of fields, in the low lying area's between dunes, and in the case of rain-fed arable fields, in the flatter areas of the undulating coastal plain. Gardens are fenced using a variety of available materials, while fields are left unfenced.

Each umzi exercises sole usufruct and exercise of responsibility over its own allocated gardens and fields, although many of the communities' gardens and fields are sited in close proximity to each other. Both fields and garden sites are granted to particular umzi by the elected village headman upon agreement with other members of the community.

4.2/2 – 3. Garden cultivation

Gardens vary in size, depending upon the needs, capacity and motivation of individuals within umzi. Sizes of gardens range from small plots averaging about 50 square metres, to areas covering ½ to 1 ha. Gardens are planted with a range of fruit and vegetable crops, although not all gardens favour the same distribution of crops.

While some gardens are predominantly planted with yam and bananas, other umzi seem to prefer concentrating on vegetable cultivation. While men do assist with garden tasks, in general the gardens are seen as 'women's gardens' and women take on the bulk of the responsibility for garden cultivation and planning of garden cropping, leaving the men with the responsibility of herding the umzi's cattle.

In Sigidi, a notable feature of many 'gardens' is their location within low lying, wetland areas within the dune belt. The reason locals give for sitting gardens in wetlands is close proximity to a water source, that the soil is enriched by the drainage patterns that carry nutrients into the wetland valleys, and that the soil retains permanent moisture , so the crops grew much better.

Box 8. Sigidi Narrative on 'Betterment', Placement of homesteads, Cell phones and Land Use.

(Source. A collective of opinions from interviews with Sigidi farmers) Sept. 2010

In Sigidi we like to place our homesteads at a polite distance from each other for privacy. There is no privacy for a family if people live too close to each other. In 'Betterment' villages, houses are too close to each other and there is no privacy. In 'Betterment' if you have a quarrel everybody in the neighbourhood can hear because houses are too close. Being too close does not create a nice atmosphere.

In years gone by, when a couple wanted to build a new homestead, they would look at the ground and find a place with lots of earthworm casts and build near there. The earthworm casts showed that the ground was very fertile in the area, so they would be guaranteed good crops in their gardens because the earth was rich. Today, when a young couple are wanting to build a new homestead, they walk around with a cell-phone looking for cell-phone signal, and build where they can get a good signal. Being connected is very important to young people.

We need all this land to farm the way we do. If there were more people here we could not farm like this, and the land would become too crowded and then the soil would be used too much and we couldn't let it rest to recover.

A government minister came and told us we had lots of unused land. We said "According to who? What do you know about the way we farm? We use all this land".

What is not used for growing crops is needed to graze our cattle and goats, and we also have areas which we set aside to cut thatching grass. If there were more people than the land would be over-used. The minister had no idea about our way of living.

Box 10. Narrative on the distribution of agricultural tasks

Source - Women farmers in Sigidi. Sept. 2010.

The men and women work in the fields together. The food is for all of them, so they all have to put in the effort to grow the food.

The men will help the women in the fields early in the day, and then later they will take the cattle out to graze and herd the cattle while the women continue to work in the fields. Then at this time of year (planting season) they will go and work again in the gardens in the afternoon as couples.

When the children come home from school they will take over the herding, and the men go and help the women in the fields. The children don't mind working. They realize how important it is to grow your own food and have your land that you look after.

Box 10a. Crops commonly cultivated in Sigidi gardens

Bananas, Sugar Cane, Cabbage, Carrots, Tomatoes, Beetroot, Spinach, Mustard Spinach, Taro yams (amadumbe).

Sigidi wetland gardens are cultivated for 5 or more years, then left to fallow and revert to wetland, and a new garden is established elsewhere in the wetland. I note that although some of the wetland is cultivated, large tracts are left uncultivated. Wetland gardens have drainage furrows dug through them. These furrows funnel available water and provide a source of water for hand irrigation when it is dry, and in the rainy season acts as drains that prevent the gardens from being flooded and turning into marsh.

Preparation for planting gardens involves ploughing if the garden is large in extent, with draft oxen or a tractor if this is available. Small gardens are hoed. After the initial sod turning, shallow furrows are

prepared in the cultivated land, and each furrow is filled by hand with old cow manure collected from the cattle kraal by sled. Seedlings are planted directly into the cow manure. Different varieties of vegetable are inter-cropped amongst each other in a mosaic pattern.

Seedlings are grown in a separate part of the garden where they can easily be watered and cared for, and planted into the larger garden when robust enough. If it is dry, seedlings are irrigated with water from the drainage furrows using hand- made watering cans constructed from old drums and recycled plastic containers of various sorts. Remaining areas of grasslands as well as uncultivated wetlands are used as commonage for livestock grazing, and collection of natural resources such as thatching grass and reeds.

Figure 9. Sigidi taro field prepared for cultivation, with furrows left for drainage.

Figure 10. Working taro fields (unfenced) and wetland gardens (fenced) in Sigidi

Figure 11 Sigidi wetland gardens and taro fields

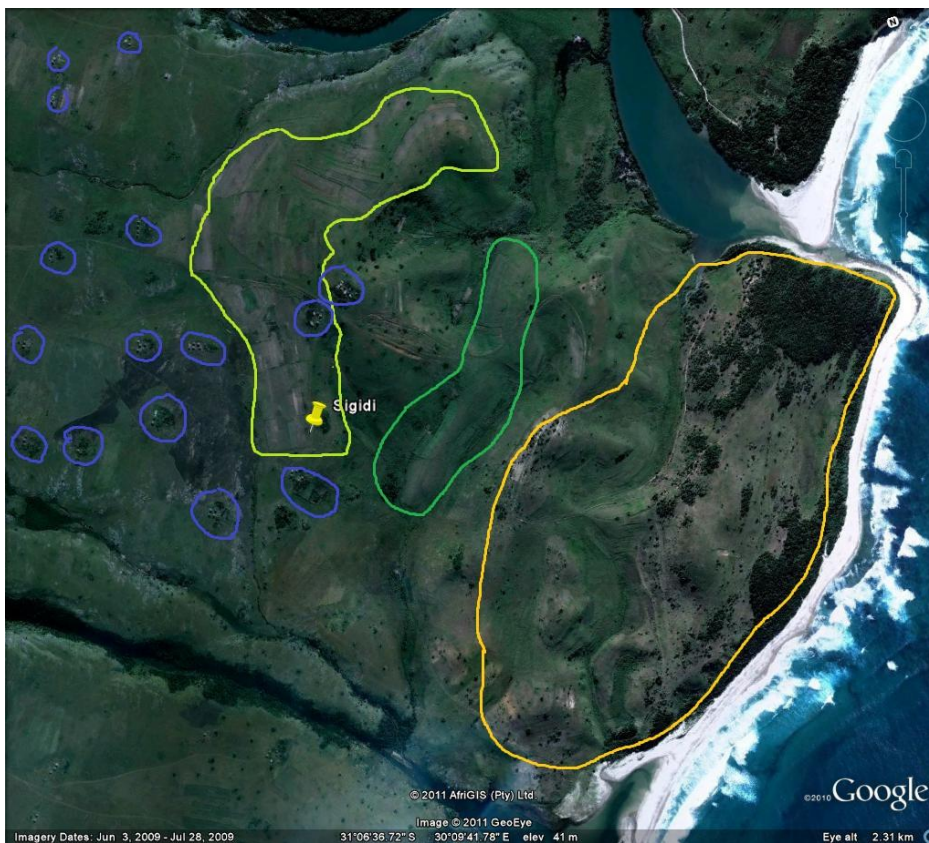

Figure 12 Diagram of spatial arrangement of Sigidi umzi, fields and gardens within the landscape

Key to diagram

Blue	*Homesteads - Umzi*
Yellow brown	*Coastal Dune Belt*
Green	*Wetland Gardens*
Lemon yellow	*Arable Fields for dry irrigation of maize/ bean/ pumpkin poly-crop*

Box 11. Sigidi narrative. On Land Title, Food Security, Communal Resource Management, Sense of Community and Kinship ties.

Source. Women farmers' discussion. Sigidi. Sept. 2010.

We don't agree with the idea of selling land. What would we want to sell land for? Land is to be used as you need it. It is not the land itself that you want, it is what the land can produce. If you sell land, how will people without money be able to get hold of the land they need to grow food. Our system works very well. You are given the land that you need to grow the food you need, so there is always enough food. If you don't need it anymore, it can be given to someone else who needs it.

*The people across the river Mzamba (*referring to the peri-urban ribbon development that has sprung up in the neighbouring community on the outskirts of Port Edward*), they are crowded and don't have the space we do to farm. There if you don't have money from a job, or your money runs out before the end of the month, then your children go to bed hungry. Our children never go to bed hungry. The Mzamba people are very concerned about money, because if they don't have money then they starve.*

The (Sigidi) schoolchildren come and work in the fields after school. They know that in order to eat, they must help in the fields to grow the food. If there is no work done in the fields, we will not have enough to eat.

Most of the women here make their own bread. There is a spaza shop, but they say the bread in the spaza shop is stale, and it is better to make your own so you can have fresh bread every day.

Some people have child welfare grants, but they use that money to send the children to school. They do not see it as a reason that you don't have to work on your land anymore.

We sell some of the produce we grow and that pays for our children's school fees. Some people have paid for their children to go to University from their gardens. Mrs X made R16000 just from selling her yams, which paid for her second child at University, This is her second child at University. It is very important to us that we look after the land properly, that is why we don't burn so much. You must only burn after the rains have come, otherwise you destroy the roots and the plants won't grow again.

If anyone wants to plough up virgin land, they first have to go to the sub-headman. Only if the sub-headman approves, then can they plough up the land. The sub-headman must represent the interests of the rest of the community. If he does not represent their interests they will quickly vote him out and put in a new headman who listens to the community views.

Sigidi is different from other areas because there are only 3 clans living here. The Dlaminis, the

Gampes and the Mpatuma's. The rule is the Dlaminis can marry Gampes and Mpatuma's, the Gampes can marry Dlamini's and Mpatuma's, and the Mpatuma's can marry Gampes and Dlamini's. So there are large extended families and it is in everyone's interests to see that the welfare of everyone else is looked after.

If someone wants to get land in this area, they have to approach the sub- headman. The sub-headman will talk to all the people who will be neighbours. Only if all the neighbours approve them will the land be granted. This means that anyone who comes into the community must have very good relationships with all the neighbours. This means the community gets along very well together and there are few conflicts, because everyone has good neighbours. This helps us manage our land very well. It means everyone works together very well. For instance, if there is a fire , even in the middle of the night, everyone will come and help to beat it out because they all have a common interest because they all depend on the land, and they need grazing for all of their cattle, and they all get on well together. In other areas where people do not have so much concern about the land and do not get on well with their neighbours, then fires are just left to burn. This means the cattle have nothing left to eat. It is because people are very attached to the land, and it is very important to them because they are all farmers, that they are concerned to look after the land. If people don't depend upon the land like we do, then they don't care for it.

Figure 13. Wetland Banana's, heavily mulched

Figure 14. Shallow trench filled with old manure in preparation for planting vegetable seedlings

In Sigidi, insects are controlled through the application of powdered commercial pesticides that are sprinkled on top of garden crops if signs of insect damage are noticed. Local lore is that insects came flying from above, not from the roots, therefore it does no good to sprinkle pesticides around the roots, but on the leaves where pests land. A favoured pesticide is the powdered 'Blue Death'.

It is common practice to heavily mulch banana's with straw and banana leaves, while sugar cane is also heavily mulched with trash from sugar leaves and straw. This is done to keeps the roots moist and make the ground rich, I am told. It is not local practice to mulch vegetables.

Box 12. On Food Security, Commercialisation and Food Prices

(Sigidi discussion group, men and women, Sept 2010)

I asked the people of Sigidi whether the effort of growing food for themselves was worthwhile, could they not get it cheaper in the shops? My question was met with laughter. I got the impression they thought my question was quite absurd and illogical.

Response: *If we had to buy all the food we grow – how are you going to afford to buy all that food if you don't have a lot of money from a job? You would need a lot of money. Depending on how much people plant, but most people here have food for most of the year. Some people run short in December and January between harvests, and then they have to buy food, but those who plant enough have enough for all year around.*

This year some people sold a lot of yams to Indians who came from Durban to buy, but now they realize they sold too much and it is costing them more to buy food than when they had all their own. Next year they will make sure they keep enough for themselves before selling too much.
Some of the food we grow is sold to local people, but because everyone grows their own it is difficult to sell locally. We could grow a lot more if we had somewhere to sell it.

The Indians who came bought our yams, but we think they were ripping us off. We were selling them by the bucket, and they wanted the bucket to be heaped on top. Then we realized that if you sell by the kg like they do, you make a lot more money just by those extra kg's on top. They paid R20 a bucket, but in Durban when you sell by the kg that amount sells for about R120.

4.2/2 - 4 Field Cultivation

Sigidi fields are sited in flat, grassland regions of the coastal plain.

Fields are generally much larger in extent than gardens, covering several ha, and are used to cultivate sweet potatoes, maize, beans, and pumpkin. Sweet potato are grown separately from other crops because of their rampant tendency to smother other crops, while maize, beans and pumpkin are grown together in a poly-crop system.

In Sigidi, fields are first prepared by ploughing with draught oxen or tractor. Once fields have been ploughed, shallow individual pits are dug and filled with old manure carted from the cattle kraal by draught sled. Seeds of pumpkin, maize and beans are dropped into each pit. In the case of sweet potato each tuber gets its own pit.

Unlike gardens, production of field crops is rainfall reliant, as all fields are rain fed. Fields are only cultivated once every two to three years, in a cyclical rotation pattern. After planting for a year, they are left to fallow for one or two years before being replanted.

4.2/2 – 5. Cattle ownership

Ownership of several to a dozen cattle is common amongst umzi. Each umzi that keeps cattle has its own kraal in which the umzi's cattle are penned overnight. Ownership of small livestock, particularly goats and chickens, is widespread. Those families that do not have cattle are allowed free access to kraal manure for crop cultivation by those families who do keep cattle. Cattle are used for draft, meat, milk, and occasionally to sell if extra money is needed.

During the summer crop growing season, unfenced fields means that cattle herding is considered an extremely important task, as unherded cattle are likely to eat the crops in unfenced fields. During the winter fallow season, cattle are allowed to graze on crop residues in both gardens and fields. In addition to cattle, goats, pigs and a variety of poultry (ducks, fowls and geese) are frequently kept in free range conditions and valued as a source of meat protein. Poultry eggs are not commonly consumed as there is a cultural taboo around women of fertile age eating eggs.

Figure 15. Poultry and small livestock are frequently kept as a source of protein. Here chickens are fed on termites collected from the surrounding veldt.

4.2/2 – 6. Passing on intergenerational farming knowledge

Farmers in Sigidi say they learnt to farm from their parents, and consider it very important to pass their skills and knowledge onto their children so they can also learn to farm the land.

Box 13. Importance of intergenerational knowledge

Elderly Sigidi woman farmer and mother. Sept 2010

I learnt to farm from my mother, who learnt from her mother, and I am teaching my children how to farm. They (the children) come and work in the field every afternoon after school to learn how to farm. This is very important otherwise how will they learn how to care for the land and grow food for themselves. The children realize this.

4.2/2 – 7 Seed collection

Traditional crops of maize, beans, taro, sweet-potato, pumpkin are all cultivated from seed saved from the previous year. People favour the traditional varieties of these crops and are wary of bringing in new varieties of the traditional crops in case these 'contaminate' the traditional varieties through cross-pollination.

Yet there is also great interest in learning about the seeds of 'modern' vegetable crops and experimenting with new varieties that are not commonly traditionally grown. During a field excursion, I was asked whether I knew what carrot and onion seeds looked like, as local farmers had only recently experimented with growing these crops and wished to know how to save the seeds. I pointed out flowering onion and carrot heads, and explained what the seeds would look like once the seed heads had matured. One women delightedly told me she had left some of the previous year's carrots to flower, and had now found that carrots had self-germinated in her garden.

Figure 16. Homemade watering can from recycled plastic oil container

Figure 17. Sigidi Farmer- gardener gathering taro in her wetland garden, demarcated by the fence and including the Banana plantation.

Figure 18. Detail of fence tie made of torn bark strips

4.2/2 – 8 Interview with Mr Gampe. September 2010.

Mr Gampe is at least 70 years old and is considered one of the oldest elders in the Sigidi Community. I interviewed Mr. Gampe to find out what changes he had noticed in the Sigidi community over his lifetime. Mr Gampe lives on the edge of the escarpment above the coastal plain, with a large extended family consisting of a wife and many daughters and grandchildren. He keeps numerous cattle, goats, and chickens and a large garden.

Box 14. Mr Gampe's Narrative

Things have changed a lot since I was young. The foods we eat have changed, and people buy much more than they used too. This means they have come to rely on money, and the things that money can buy. We used to provide all our own.

Education has meant that people don't value the traditions as much as they used too. They think our things, and our traditions, are not so important anymore. They like the western ways.

The food you buy in the shops, it is not as healthy as our traditional foods. It is full of too much oil and doesn't keep you satisfied. That is why there is so much ill health, because of the poor quality of food people buy in the shops and eat. Sugar, tea, coffee, juice, rice, that fancy smelly stuff Dawn that young people like to spread all over their bodies – men and women used to use pigs fat to smear their bodies with and it was very healthy for the skin- all these things are new and cost a lot of money to buy, so people then find they need to get jobs to get money. When I was young we used to have traditional foods that these things have now replaced. The traditional food were filling, and there was plenty to go around, and they kept everyone healthy.

We had many traditional crops that are no longer grown. I don't even know if one can get some of these anymore because people grow European crops. The variety of sweet potatoes have changed. The ones that are grown now are different from the ones we grew when I was young.

People do not grow as much food as they used too, and the yields are not as good. The land is not as fertile as it used to be. It is chemical fertilizers that have destroyed the land. When you start to use chemical fertilizers, you cannot go back to the old ways because the land comes to depend on these fertilizers and then you can't grow anything without adding chemical fertilizers, and they cost a lot of money. So your food becomes very expensive to grow.

We go and see Mr Gampes garden, situated besides a spring on the edge of the garden. It is very dry as the rains are late, and the spring that the family rely on for irrigation has dried up, so the garden is very parched.

Mr. Gampe is very worried about the rain being so late. He thinks people might have done something

to disturb the rain so it is not coming when it should.

I ask why they have not planted in the wetland like other people in the area.

The wetlands are near the coast, and we live on the hill. There is a wetland nearby here in the valley, but it is a long way for us to walk and very isolated. We thought it is better to have our garden closer where we can keep an eye on it and on the people who are working in it. If the garden is too far, you can't keep touch with the people working in the garden if there is a problem. Normally if it rains it is a very good plot, but now we are battling because it is so dry

Figure 19. Rondavel at Mr. Gampe's umzi, with small livestock, garden utensils, horns decorating the roof, and garden in the background

Mrs Gampe makes mats out of reeds she cultivates in her garden, for selling to tourists. The family also makes their own bricks out of mud and straw for building, using a handmade brick mould.

Figure 20. Handmade bricks

Box 15. Traditional recipes and foods no longer commonly eaten in Sigidi	
Isigwane	A mixture of mealie meal, beans and salt.
Isigwampa	A stew of mealie meal and imifino (cooked leaf greens).
Umcuku	A porridge of sweet potatoes and sour milk
Umqhavunyeko	A mix of maize and beans
Instswele ehashe (horses onion) (see fig 20)	

Figure 21. Instswele ehashe

4.2/3 – 1 Case study 2. Mthambalala and Nonjojo

Mthambalala and Nonjojo are two small rural communities in the vicinity of Ntafufu and Manteku Rivers respectively, lying north of Port St John's. Unlike the gently undulating to flat landscape around Sigidi, the terrain in this region is extremely and steeply hilly. High summer rainfall, high humidity and warm, frost free, dry winters create a sub-tropical atmosphere, although the region falls within South Africa's warm temperate climatic zone. The landscape vegetation consists of large areas of dense coastal forest on hillsides and reverie valleys, interspersed with clearings of grasslands. Soils are predominantly deep, black, sandy clays.

Access roads to both villages are gravel and very winding. After heavy rain they are often impassable except by four wheel drive. The closet town to Mthambalala is Port St John's, approximately 45 minutes away. Lusikisiki, about one hour drive (depending on the state of the road), is the closest town to Nonjojo.

Interviews, focus group discussion and field visits to farmers in the villages of Mthambalala and Nonjojo were undertaken on two different occasions, on the 17,18,19 March 2010 and 2,3,4 June 2010. These consisted of visits to individual farmers to observe local farming practices, as well as in depth focus group discussions with groups consisting of a group of about 8[19] young men (below the age of 30) with an interest in farming, 14 adult women of all ages involved in farming, and various older men farmers (over the age of 30). The ages of participants ranged from early twenties, to old age. The oldest participant was reputed to be at least 110 years old, as he was said to be a young teenager during the time of the Great War in 1914. Visiting the area at different times of year gave me a chance to observe agricultural practices in different seasons.

The visits to Mthambalala and Nonjojo were pre-arranged through a colleague and friend of mine, Sinegugu Zukulu, who is familiar with the area and also acted as my translator. Sinegugu had pre-informed a local 'go-between', Makuwa, of our intentions and invited Makuwa to invite anyone interested in participating to be present on the pre-arranged day. No definite pre-arranged time for meetings was given as I was told the local custom was for local people to keep a look out for the vehicle. When they saw the vehicle arrive, that would be the notice for them to start gathering for the meeting. This custom enabled them to carry on with their chores without having to needlessly wait for visitors who might be delayed.

Although my original intention was to keep different focus groups separate, in order to try and uncover inter-generational and gender differences, in the event the informal nature of community life (and the extra-ordinary nature of my visit in the everyday life of the villagers) made this impossible. As the day wore on, curious by-standers joined in the discussions, or various participants left if they had chores to attend, and sometimes came back again at a later stage, sometimes with companions they had gathered.

I began with a focus group discussion amongst the youth, but when the time came to move onto the women's focus group, a number of the participating youth decided they would like to come and hear the women's perspective, so became listening (and sometimes commenting) participants in the discussion in that focus group as well. As the day wore on the event became a social occasion, a local entertainment, and a fluid and evolving educational process and debate as questions were asked, discussion ensued, and differences of opinion were aired and debated.

In the first visit my emphasis was on discussing local farming practices, the influence of changing culture on local agrarian practices, and the perspectives that different generations held about farming in general. I also visited some of the fields and gardens of participants.

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[19] Numbers of participants in these group discussion are approximate, to account for the informal comings and goings of various participants throughout the day.

I had been warned by Sinegugu that, given the oral culture of the people, 'pens, papers, writing and questionnaire's' were often viewed with suspicion as being signs of 'authority' associated with officials from 'egoloment' (government) and that using these would make people feel ill at ease, suspicious of my intentions, and so more reserved in their responses. With this in mind, I carried a small portable voice recorder with which to record the discussions. All participants were asked, before recording, whether they were agreeable to the recording. The presence of a voice recorder, apparently, did not carry the same formal authoritarian connotations as pen and paper, and its recording presence appeared to be quickly forgotten in the ensuing discussions.

In the second visit I tried to discover the relationship between local socio-cultural belief systems, and perceptions of nature and the environment, to try and get some understanding of the 'Gestalt[20]' of the relationship between local people and their environment. This visit proved to be a more difficult undertaking than the first.

The group of women we had arranged to interview had decided that their more pressing task was to collect reeds for mat-making at the river, and had left instructions for us to find them there. Upon our arrival mid-morning, we found that the young men bearing the message were not sure which part of the river the women were harvesting reeds from, so we set out on a two hour hike over rough terrain to find them, the terrain including hills, valleys, forest, grasslands and streambeds. When we finally reached that part of the river where the women had been harvesting reeds, we found they had already departed for home via another route. We eventually caught up with them in mid-afternoon, but the delay had limited the time we had for discussion. The women were also reluctant to discuss some of their belief systems with a stranger. I was told that some of "these things should not be discussed in daylight, as if you do you will grow horns out your head". However, in the informal atmosphere that the impromptu hike had created, the group of young men who had appointed themselves as our guides had been very forthcoming about various of their experiences relating to their beliefs, giving me a valuable experience of seeing the landscape from a local perspective, as these self-appointed guides pointed out various things in the vicinity of relevance to them, and pointing out changes that they had noticed occurring over time in the environment.

If one follows a direct line Mthambalala and Nonjojo are approximately 10kms from each other, but there is no direct road access between them. The tumultuous terrain means that vehicle travel between the villages requires a journey of about 40 minutes to the R61, a journey of 20 minutes along the R61, and a further 40 minutes journey down the next district road. This means that although these

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[20] Gestalt refers to the broader world-view and belief systems that inform human behaviour.
" Gestalt –(Psych.) Perceived organised whole that is more than the sum of its parts" (OED 7th ed: 414)

communities are spatially close to each other, they are also essentially isolated from each other by the terrain. Mthambalala and Nonjojo are approximately 70kms from Sigidi, although vehicle travel between these communities and Sigidi involves a journey of about 5 hours.

Travelling to Mthambalala and Nonjojo, one notices that in the vicinity of national route R61, the landscape is relatively much more densely settled with umzi. The number of umzi scattered across the landscape declines as one moves away from the national road towards the coast. As the number of umzi declines, they also tend to become much less densely clustered together. There are few settlements right along the coastline.

Figure 22. Landscape near Mthambalala, showing settlement pattern with the majority of umzi having extensive gardens adjacent to them. The landscape is more intensively populated than at Sigidi.

Figure 23. Nonjojo landscape, a mosaic of forest, fields, gardens, umzi and grasslands.

'The government does not allow people to settle right on the coast. People recognize that the coast is for the use of everyone, so nobody settles there" (Womens Discussion Group, Nonjojo, 18/3/2010) I am told when I ask why settlement is sparse along the coastline.

When one walks or drives through the forests, there are signs of extensive earthworm vermicasts[21] on the ground. Local people say there are many earthworms in the soil.

Figure 24. Numerous vermicasts litter the floor in Ntafufu forest, indicating extensive earthworm activity

Like Sigidi, in Nonjojo and Mthambalala, human settlement is in loosely scattered 'villages' typical of the dispersed traditional amaMpondo settlement pattern. Each 'village' or community consists of a number of loosely scattered family umzi. Each umzi consists of a number of separate dwellings, with different dwellings often inhabited by different members of an extended family. Several generations may therefore inhabit each umzi. The most common dwellings are round, thatched huts made with homemade straw and mud bricks which are piled around a wooden frame and 'plastered' with a mixture of cattle manure and mud. There are also a number of square 'modern' brick buildings with zinc roofs, and a few concrete brick houses.

4.2/3 – 2 Agricultural practices

Fields and gardens are prepared in early spring by ploughing or hoeing. Small gardens are hoed. Larger areas are ploughed with spans of oxen or donkeys, or a tractor if one is available and funds allow this. Elderly farmers in particular say they prefer to hire a tractor to plough as they no longer have the energy to plough and hoe themselves.

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[21] Earthworm activity is an important sign of fertile soil, as earthworms facilitate biological processes that maintain and restore soil fertility. Through their actions, earthworms restore soil humus and soil aggregates that facilitate soil aeration and water holding and drainage capacity, increase micro-biological activity in soils and release nitrates, all of which are beneficial for plant growth (Murphy, 2005).

Poly-cropping is the preferred methods of growing crops, although the planting of different crops is staggered over the season. In a maize, bean, pumpkin polycrop, beans are planted first. When these have germinated, maize and pumpkin are planted amongst them. When beans are mature and dried, they are gathered and a second crop of beans is planted amongst the drying maize and pumpkins in Autumn, so that two crops of beans can be grown a year. In some instances fields are first prepared by ploughing, then planted. An alternative method of planting, especially maize, is to scatter all the seeds onto the field on the previous years' residues and weeds, and then plough everything under the ground together. In gardens, vegetables may be poly-cropped with maize and beans. Fruit trees are common grown around the periphery of the gardens. Potatoes, sugarcane and taro are grown separately from other crops. Weeds are hand pulled or hoed out, and left lying in the fields to compost. Like Sigidi, fields are not fenced although gardens are fenced.

Box 16. On traditional dwellings and social customs

Sources. Nonhle, Sinegugu, and Nobuntu.

Traditionally, it is important for amaMpondo to build a traditional rondavel, even if they have a 'modern' rectangular house that they live in. We build a traditional structure so that we can provide a house where the spirits of the Ancestors will feel comfortable and at home. We use this structure to conduct our traditional rituals and ceremonies. If one goes into a traditional rondavel, it is important to follow traditional arrangements of seating and other traditional social customs otherwise the Ancestors will become upset that you are breaking traditions.

The left side of the hut is the women's side of the hut. This side is kept for women and for women's activities. Here you will find all the household utensils that the women use and that belong to them. The woman's side is a very busy side.

The right side of the hut is traditionally the man's side of the hut. Here you will find the things that the husband keeps. On the man's side of the hut is often a small altar for burning herbs and placing medicines for communication with the Ancestors or from protection from evil spirits.

If you are in a social gathering of men and women, you must not cross the floor to sit on the other side of the hut, or you will upset the Ancestors. In modern rectangular buildings these traditional customs do not apply, as the Ancestors are not concerned with modern ways.

Figure 25 and 25a. Ploughing with a span of oxen after sowing. Seeds are scattered over the previous year's field residue (see fig. 25a), and all ploughed into the field together.
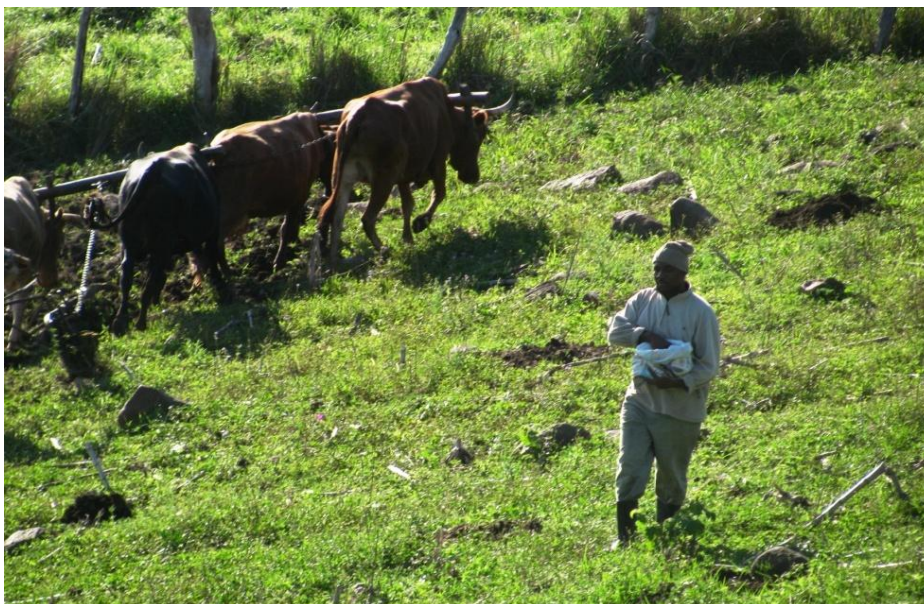
Box 17. Crops grown in Nonjojo and Mthambalala	
Popular and Commonly Grown Garden and Field Crops	Maize, beans, pumpkins, potatoes, taro, sweet potatoes, sugarcane, sorghum, chillies.
Popular and Common Fruit trees	Mango, Avocado, Bananas, Pawpaws, Lemon, Limes, Oranges, Guava's
Less common crops that are grown by some umzi.	Papyrus for weaving, peanuts, tomatoes, carrots, 'wild spinach', granadilla's, pineapple.

4.2/3 - 3. Field fertilization

Unlike Sigidi, no fallowing of fields takes place and manure is not regularly applied to crops upon planting in these villages. The majority of people I spoke to said they never used fertilizer of any sort because the soil in the area was so rich it did not need the addition of fertiliser, though some said they occasionally used cattle manure around the fruit trees or if they felt certain garden plants needed a boost.

I did notice though, that ash from domestic cooking fires was commonly piled into a heap. When I asked why this was done, I was told it was applied as a mulch to the base of fruit trees to keep insects, in particular ants, from climbing up the trunks. I also saw piles of maize husks and leaves left around the base of fruit trees, and winnowed into rows in the fields and left to decompose, serving as a source of organic compost for the fields. The idea of 'fertilising fields' might therefore be associated more with chemical fertilizers, rather than the idea of organic methods of 'fertilization'

Some gardens are planted on very steep slopes. Contours are not regularly used.

"People plant on steep slopes because the area is very hilly and there is not enough flat land for everyone to plant or build on flat areas" (Tutani, Mthambalala farmer. March 2010).

Sugarcane is cut and sold raw to schoolchildren as a 'sweet' and a source of cash income. The majority of crops are grown primarily for home use, and only excess is sold for cash. Maize is no longer considered an important staple food, but is grown mostly for brewing traditional beer and for livestock feed. Maize is still commonly ground by hand by women, using hand mills or grinding stones.


Figure 26. Grinding maize using traditional moulded stone and stone crusher

Figure 26a. Youth demonstrating the use of a mechanical hand grinder, catching the meal in a hand woven basket. This task would traditionally be done by women.

Some households grow papyrus specifically to make household utensils. Papyrus stems are used for mat weaving, and leaves are used for hat and basket weaving and for making *isitebe* (also refer Box 5 and Figure 29). Although these are used in the household, they are also sold for cash income. Reeds gathered from river margins are important resources for basket and mat manufacture.
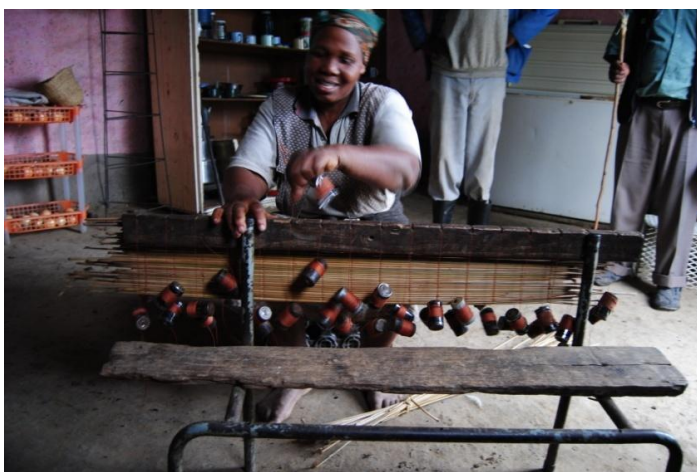
Figure 28. Weaving a reed mat on a hand- made loom that doubles as a bench, using recycled batteries as thread weights.

Figure 29. Chillies stored in hand woven basket

Figure 30. Isithebe, a traditional woven food platter

Box 18. On land acquisition, livestock management and changing value systems
Women's discussion group, Nonjojo. March 2010.

We don't pay money to buy our land, and we don't pay rent. If you want land for fields or an umzi, you must make a request to the local village headman. Land will be granted if you have a clanship with the village, or at the discretion of the village headmen. Village headmen are democratically elected by people in the village. Periodically the headman may resign and a new headman will be elected. Headman act as village representative at local Chiefs Council and in other matters of decision making that require village representation.

Once land has been granted to a family, it will stay in that family and can be passed on by inheritance to other family members, as long as it is occupied and used by the family. If the family does not occupy it or use it for a long period, then the use falls away and the land can be given by the village

headman to someone else.

Grazing is in common areas set aside for cattle and goats. This is normally some distance away from the village and from the crop fields. Our custom is for male members of the family, traditionally the young men, to tend to the cattle and bring them back in the evening to be kraaled in family kraal near the homestead. Most households have some cattle and goats. Livestock is used in many traditional ceremonies. There is no limit to the amount of livestock a family can keep. Cattle are our 'bank' and are also used for Lobola, and for other traditional rituals. Goats are often sacrificed in our ceremonies to call the Ancestors. The meat of cattle and goats is eaten in the festivities following such rites. We also like to keep pigs, geese and chickens and some people have donkeys.

The pigs are starting to make a come-back after the government tried to get rid of them because of swine fever. When the government killed the pigs, this affected ilima because some people were using pigs to celebrate ilima. Some pigs hid in the forests when government officials came around and these are now producing babies. Small animals are left to roam around freely, although sometimes pigs are penned. We use donkeys for ploughing and pulling sleds and for carrying heavy loads. Cattle are used for ploughing, and for pulling sleds.

People know about other means of farming, but they don't follow them because they prefer their own methods that they learnt from their parents.

For the older generation, food security was more important than money. The older generation would make sure they had grown enough food for the household before they looked for money. The young would rather have money than grow their own food. These days the youth are reluctant to join ilima because they are not paid for the task. They have social grant money to buy beer and food if they wish.

4.2/3-4 Seed collection and storage.

Although some of the farmers in this area reported buying maize seed, others said they preferred to use their traditional seeds, particularly the seed of maize, beans and pumpkins. Upon harvesting, maize seed and cobs are traditionally graded into 3 categories. The best quality seed and largest cobs are dried and kept aside for reseeding and planting, as well as for cooking and eating later in the year. Second grade seed is kept for human consumption and to feed livestock. Third grade seeds and cobs are used for beer making.

Various methods are used for drying cobs. These include hanging selected cobs in bunches out in the open to dry, laying them on a flat surface such as a rooftop or canvas on the ground, or hanging them in a rondavel where the smoke from open cooking fires is believed to repel insects.

Fig 30, 31, 32. Methods of drying seed maize.

Figure 31. Maize drying on canvas

**Figure 32. Cobs hanging from hut rafters
over a smoke fire**

Figure 33. Seed maize drying in a tree

Traditionally, maize for consumption was in sealed underground storage pits, or isisele. This practice is no longer followed and maize is stored either in bought steel or plastic tanks, or in above ground woven storage bins and baskets.

Box 19. 'Isisele' - Storing maize in underground pits

Source. Tutani and Sinegugu, Mthambalala. March 2010.

The amaMpondo traditionally dug maize pits on a hilltop, in clay soil, as this meant they were above water table and water did not run downhill to flood them. Clay soils helped keep the pits dry.

An entrance hole was dug about ½ metre deep, and then the earth was excavated out in a dome shape underneath. The isisele was traditionally dug as deep as a man with his arms stretched above his head, and the same width as the depth so a man could lie down with arms outstretched above his head. The pit was plastered with cow dung to seal it, and a fire built on the pit to dry it out before maize was stored there. Maize was carried to the pit by ilima using ox or donkey drawn wooden sledges.

The isisele entrance was sealed with a large stone, with the edges sealed with fresh cow dung. This was then covered with a mound of soil. The maize could be stored there for the whole year, or even longer. No pesticides where necessary as heat and gases were released in the pit that fumigated the maize. When the pit was open, the entrance was left open for at least a day before anyone entered, to release the noxious gases. Sometimes a match would be lit at the entrance and this caused an explosion in the pit that burnt up all the gases. If water seeped in, the maize around the edges would ferment. This fermented maize had a particular taste that used to create special dishes. If the maize started to sprout in the pit, this maize would also be used for special recipes.

Figure 34. Entrance, disused isisele, Mthambalala.

4.2/3 – 5. Control of Vermin

At Mthabalala, farmers in close proximity to forest areas complain of problems with vermin consuming their crops. Traditionally, young children would have been tasked with guarding the fields against these pests, notably monkeys, bush pigs and sugar cane rats. With children going to school, there are no longer youth readily available to guard the fields, so that vermin such as monkeys have become problematic. Some Mthambalala farmers cope with the vermin problem in unique ways.

Ukulinda - The Use of 'Monkey Dogs'.. Dogs have been trained to guard the fields against monkey's, in a practice called "Ukulinda" (to wait). To train the monkey dogs, selected domestic dogs are only ever fed their food rations at the field they will be trained to guard. A shelter is built in the field in which the dogs can be protected from the elements. During the day the dogs' bucket of food is left hanging at the field out of the dogs reach, and is only put down in the evening for them to eat.

"This way they learn to stay in the field. They are trained to watch for monkeys by encouraging them with noises to chase monkeys in the trees. So they learn to spend all day waiting in the field, looking out for movement in the trees. When the monkeys come, they start barking. This chases the monkeys away. It also alerts the owner of the field, so he can come and encourage the dogs to chase the monkeys" (Farmer and Monkey Dog trainer. Mthambalala. March 2010).

Wild Bush Pig Deterrent. Bush pigs are discouraged by keeping smoky, smouldering fires burning in the fields. The bush pigs are chased away by the smell of smoke.

Sugarcane Rat Deterrent. An area around the field of about 1 metre wide is kept clear of all vegetation. Sugarcane rats do not like to cross a cleared strip, so this practice discourages them from coming into the maize field.

Figure 35. Monkey dog shelter

Figure 36.

Google Earth photograph of Nonjojo. The majority of umzi (outlined in blue) in Nonjojo have large adjacent gardens. Some umzi have gardens that extend into fields in close proximity to the umzi (gardens and fields outlined in light green).

According to local people, light green patches of vegetation in the valley adjacent to the settlement indicate areas of recent forest re-growth that were once cultivated fields (outlined in red), but these have been deserted since 2004 due to a declining interest in agriculture as a consequence of the introduction of social grants .

The hilly nature of the terrain means that many fields and gardens are planted on steep hillside slopes.

Key. Red lines –regenerated forest/deserted fields. Blue – settlements, Green – current fields

Figure 37 Google Earth photograph of Mthambalala settlement, showing dense settlement and extensive field cultivation around umzi. (background photograph Google Earth)

(Key. Blue lines –umzi. Orange lines – fields. Green lines -gardens)

Figure 38. Field cultivation in Mthambalala extends into area's some distance from the settled area of umzi. This may be a consequence of high population levels leading to all suitable land around umzi being already cultivated, this requiring expansion into cultivated areas further away from umzi. Google Earth photograph of Mthambalala with illustration lines added by V.Payn.

(Key - Blue line outlines settled area (shown in fig 36). Orange line outlines fields away from settled area)

4.2/3 – 6 Recent declines in agricultural productivity.

The farmers of Nonjojo said agricultural productivity in the area had declined in recent years. People pointed out many fields that they said used to be cultivated, as late as 2004, which are now lying uncultivated. In some of these, forest re-growth can be seen as light green forest, as opposed to darker old growth forest. Elderly women recalled storage huts brimming with maize, beans and pumpkins. *"You would be carting many sleds of produce all day, for many days, to bring it all in"* (Womens focus group discussion, Nonjojo). People gave many reasons for the decline in agricultural productivity, although reasons for the decline differed amongst different age groups.

The reasons the elderly gave for declines in agricultural activity included:-

- Social grants. *"People don't have to grow their own food so much anymore, they now have money to buy food from the store* (Young Men's Focus Group Discussion, March 2010) *Young girls would rather earn money by getting pregnant than working in fields. Having babies is a business for young girls now. Social grants mean young girls no longer have to listen to parents, as they have their own money from making babies so are not dependent on parents anymore"* (Comments from Women's Focus Group Discussion, March 2010, Nonjojo).

- Undisciplined and lazy youth. *"Government policies mean youth have got 'rights' so they can no longer be disciplined properly by parents. For instance, people no longer respect traditions that reserved drinking for the elderly, so young men get drunk instead of working. The youth are lazy because they can get money from grants so they don't have to work anymore"* (Elderly men's focus group discussion, Mthabalala, March, 2010)

- Compulsory education. *"There are no young boys to help with herding and no young girls to help in fields as they are at school every day, so these tasks are all left to old people who should be retired. Education means that youth see certain tasks as beneath them so won't do them anymore"* (Women's Focus Group Discussion, Nonjojo, March 2010).

- Not enough manpower to undertake heavy agricultural work. *"Many of the men are working away from home. The youth and girls are in school, so can't help with tasks anymore. The customs that enabled many people to gather to help with labour intensive tasks are not practiced to the same extent anymore"* (Women's Focus Group Discussion, Nonjojo, March 2010).

- Changing values. The old people thought growing your own food was more important a priority than making money. *"The youth think making money is more important than growing your own food. The youth want lots of things that only money can buy – cell phones, brick houses, bicycles, smart cars, groceries from the store. The only things we used to buy from*

the store were candles, matches and blankets. The list of things needed from the store now is too long; it would take too long to write down all the things the young people want from the store. Samp, beans, maize, we used to grow all these things for ourselves and have enough to swap at the trading store for blankets, now we buy them from the store!" (Elderly male farmer, Nonjojo, March 2010)

- Changing social traditions and customs, including changing food tastes. *"The maize is no longer stored in pits (isisele), so many of the traditional foods that was made with that maize, because it had a particular flavour, is no longer made. Youth don't like to eat the traditional foods anymore and want to buy stuff from the grocery store. Young people want to eat rice and spaghetti, not maize. Because the harvests have shrunk, and there are no longer big fields that are planted, people no longer celebrate the communal occasions that were required to prepare the fields and bring in the harvests. These were social occasions that really brought the community together and created a sense of spirit amongst the people, and enable people to share the plenty'* (Women's Focus Group Discussion, Nonjojo, March 2010).

- *"Young men are at school and do not want to herd cattle anymore, so unherded cattle eat the crops in unfenced fields. This discourages those who grow the crops*" (Women's Focus Group Discussion, Nonjojo, March 2010).

- The elderly are concerned that their knowledge and traditions are not being passed on, and say they feel a sense of loss at this. *'The youth don't want to listen to us anymore. The youth can't be told what to do by us anymore. They are not interested in hearing what we have to say'.* (Women's Focus Group Discussion, Nonjojo, March 2010).

    Government policies that are not relevant to the way of life. *"The government makes decisions without consulting about what the people want."* (Mens' Focus Group Discussion, Nonjojo, March 2010)

    (**Note**. the above comments are the combined comments of the Nonjojo women's discussion group and the comments of various elderly men farmers)

The young men gave a different set of reasons to the elderly for agricultural decline. These included:-

- That agriculture did not provide a viable income. *"Money can best be made by getting educated and getting a job. There is not enough money to be make from farming*". (Young Men's Focus Group Discussion, Nonjojo, March 2010)

- Lack of interest amongst young women in farming or marrying farmers, and lack of respectable farming wives. *"The young girls won't marry you if you don't have a job and earn good money. The young girls want to buy stuff, they don't want to help you on the farm by working there with you. The girls won't marry you if they are going to have to work in the fields with you. There are no decent girls for young men to marry because all the girls get*

pregnant because of the social grants. Who wants to marry someone who has someone else's child?". (Young Men's Focus Group Discussion, Nonjojo, March 2010)

- Lack of suitable market infrastructure and viable prices for farm produce. *"It is too far and the money you get too little to make it worthwhile selling things in the towns. Locally, you can't sell anything because everybody is growing the same, so why should they buy it if they can grow it themselves. If you find something that grows well and that people want to buy it, soon everybody is growing that and you can't sell it anymore"* (Young Men's Focus Group Discussion, Nonjojo, March 2010)

Although the youth complained that farming did not provide opportunities for them to earn a viable income, they valued its importance for household food security if no other options where available to make a living. Some of them said they would like to farm if it could provide more opportunities to make a living.

"There are very few jobs so with farming you can grow your own food, but the money it makes is not very much. When you don't have a job you need to be able to farm to get food. When you get older you realize that farming is important because you can't always find a job. Farming does not make very much money, so you need a job to be able to make money". (Young Men's Focus Group Discussion, Nonjojo, March 2010)

Lack of access to markets, poor prices for produce, lack of fencing and lack of the resources to buy seedlings were listed as the main obstacles to becoming a profitable farmer. Access to irrigation was mentioned as a desirable need that would enable them to grow crops all year around, not just in the rainy season.

Box 20. Traditional dishes no longer prepared in Mthambalala and Nonjojo.	
Name of dish	Ingredients and preparation, if the method of preparation is still remembered
IGuluda	A mixture of beans and mealie meal.
Isihlopoyiya	Bean and soya bread. Soya is no longer cultivated.
Soya *amasi*	A curdled milk made out of soya
Amaqebengwana	*A* mixture of sweet potato and mealie meal which was the traditional 'bread'. Preparation. Soak dry mealies overnight in water and then grind in the morning into a dough. Grind sweet potatoes into a dough as well. Mix the mealie and sweet potato dough together to make a bread dough. The dough is cooked in a tripot (potjie). Prepare potjie pot by putting mealie cobs at the bottom and pouring water over them. Stick pieces of dough around the sides of the pot, and boil the water in the pot until the dough is ready.
Utshongo	Braai dry mealies like popcorn and then grind into a fine flour. The flour may be mixed with water/ lemon juice or amazi. This flour is perfect for long journeys as the flour may be carried and mixed as needed, and lasts a long time for hunters and fishermen.
Umqa	A mixture of pumpkins and mealie meal.
Isigwampa	A mixture of wild spinach and mealie meal.

4.2/3 – 8 Interview with Mr. Solubala. March 2010.

Mr. Solubala's umzi and fields sit on top of a very steep hill in Nonjojo. Although his garden runs down a very steep slope, into the forest, there are no contours in the field. I ask why he does not use contours on such a steep slope. He explains that as the soil is so rich and deep in these parts, the loss of a little soil does not matter. He also points out that contours take up space that could be used for planting. He says instead of making contours, he intends to plant rows of fruit trees, banana's and avocado's across the slope whose roots will help to bind the soil in place.

Mr. Solubala does not add cattle manure to his fields, but digs the previous year's crop residues into his field before planting. He also deposits goat manure into the field. He is digging a pit at the top of his garden which he intends to fill with goat manure.
"Then when it rains the manure will spill over and the nutrients from the pit will percolate through the field and so fertilise it. If we know how to use the soil properly, then we have all we require to provide for ourselves.

People go and work in the mines for someone else and dig in the earth for someone else's benefit who lives far away over the sea, but if you know how to work the soil, you can work for yourself to provide for your own needs."

Mr Solubala says he worked for 11 years for a man who taught him a lot about farming using organic farming methods. He rotates root and leaf crops yearly "Where roots were planted, next year leaf crops will be planted".
Through-out the year he prepares and plants small sections of his garden, although in spring he will clear and prepare the whole garden for planting.

In a poly-culture, Mr. Solubala grows numerous varieties of traditional beans, pumpkins, and spinach, two different varieties of sweet potatoes, indigenous varieties of 'imifino' (leaf vegetables), mdumbies, maize, peanuts and granadilla. He has recently planted avocado and bananas and is experimenting with planting maize as a winter crop. From his garden he provides the food for all eleven of his children who are residing in Durban for schooling.

He uses different storage methods for different crops. Mdumbies are stored by being left in the field, exposed on top of the ground, until the following planting season. He has given some of his land to a neighbouring woman who has no children to look after her so that she may also grow her own food. Mr. Solubala wishes to become a commercial farmer. He is working with some neighbours to try and obtain the resources needed to fence some of the old fields near the river against livestock, and start working them again on a small commercial scale. He also hopes to get a grant for installing a pump

and an irrigation system. Irrigation, he says, would vastly improve production by extending the growing season out of the rainy season. They believe once they are growing enough produce, they will be able to find markets. Beans are hand shelled and stored in plastic bins. Pumpkins are stored for ripening on the roof. Maize is dried on the cob on the roof, and then shelled and stored in bins. Seed maize is dried by hanging it from a tree or from the beam of a hut where wood smoke can help control insect pests. The best maize cobs are selected for seed maize for next year's planting.

Mr. Solubala has a small herd of cattle, which he 'treats' by giving them hand fed maize. He also keeps goats, and is looking to obtain a dairy cow to increase his milk production. He asks me if I know of anyone who would be willing to swap a dairy cow for some of his goats.

Box 21. A farmer's inadvertent experiment with different crop cultivars. March 2010

At Mthambalala, an elderly farmer took us to look at his field of maize. The centre of the field had been planted with bought maize seeds. He did not know the cultivar. The top and bottom of the field had been planted with traditional seeds that he had saved from previous plantings. He had planted all the maize at the same time, using the traditional technique of casting seeds on top of the ground and then ploughing them into the ground together with the previous year's crop residue. Traditional pumpkins and beans had also been planted amongst the maize in the traditional poly-crop system.

The planting of bought maize was a complete failure. It had germinated extra-ordinarily badly, was barely knee high, had very few, distorted cobs, and showed numerous signs of disease. The traditional maize in the same field had grown taller than head height, showed no signs of disease, and had born strong, healthy cobs.

While it is very difficult to draw definitive scientific conclusions about this situation without knowing more about the bought maize cultivar, the condition of the bought seeds, in field conditions, or without further trails into the suitability of various cultivars for local conditions, this illustration does raise numerous questions. Did the bought maize fail because of poor quality seed, because it was a cultivar that was not suited to local growing conditions, or because of variations in in-field conditions?

This illustration also raises questions about the conditions under which commercial maize is bred. The practice of seed-saving over generations might mean that local land-races have developed that are

ideally suited to local practices. Conversely, unless commercial maize is bred with local conditions and farming practices in mind, then it will be unlikely to thrive in the given conditions. 'Green Revolution' practices are aimed at breeding seeds that suit the laboratory conditions of HEI agriculture, which require adapting the environment to the seed. Local land-races, on the other hand, thrive because the seed has become adapted to suit the local environment.

Although this illustration might not enable scientific consensus, the farmer has made up his mind. He says he will never buy maize seed again.

Figure 26. Growth of bought unknown maize cultivar, in comparison with growth of traditional, saved maize seeds (following) in the same field (Fig. 27), both planted using traditional methods.

Figure 27. Traditional maize growth

Figure 28. Maize, pumpkin, bean polycrop.

4.2/3 – 9 Other Socio-cultural Relationships associated with Landscape, Land use and Agrarian practice

A complex agroecological approach not only involves understanding agricultural practices, but also understanding the broader world-view that contextualises cultural relationships to nature and land use practices. With this in mind, the following section explores some of the beliefs about land use and human relationships with nature that I have come across in Pondoland and in the course of my discussion with amaMpondo farmers.

Nonjojo women say they rely on the surrounding forests for building materials, wild foods such as herbs, leaf greens, fruits and medicines, and grazing for cattle and goats. When I asked what would happen if the forest disappeared, they commented *"If the forest disappeared, we would die".* They were concerned over the proliferation of problematic alien invasive plants that had taken over many grazing lands and clearings in the forest which they used to graze cattle.

In economic terms, the forest is considered a 'common' resource for everyone's use and benefit, although certain cultural traditions determine when certain things can be harvested.
"For instance, the local headman or chief will decide when the season for cutting thatch grass can begin. Some people have the use over certain parts of the forest if that section falls within the land allocated to their umzi" (Women's Focus Discussion Group. Nonjojo. June 2010). Despite the acknowledgement of communal dependence on the forest, there were no communal arrangements in place in Nonjojo to manage the use of forest resources, but a reliance on government guards to protect the forest.

"The government guards are there to protect the forest. People are free to use the forest as a resource if they need. You can only use dead wood from the forest, you need a permit to chop living trees". (Womens Focus Group discussion, Nonjojo, June 2010)

In spiritual and mythical terms, the forest also has significance.

"Ghosts in the forest were once very common, but now they are not seen nearly as often. This might have something to do with people now taking bodies to the mortuary for preparation for burial. Since people started taking their dead to mortuaries for preparation for burial, 'ghosts' in the forest are not nearly as common. We do not know what white people's methods do to bodies in the mortuary that reduces the likelihood of ghosts. The bodies are still buried in the forest, but the sightings of accompanying ghosts are much less common" (Nonjojo women, June 2010)
 I asked what these ghosts looked like, and was told they appeared as lights floating about the trees.

Some plants in the forest are used for pure medicine as chemical cures, but others are believed to hold magical or spiritual power.

 "Umlahla Nkosi' or "Umlahla Abantu" (Buffalo Thorn, Ziziphus macronata) has the power to call and carry Ancestor's back to the family home. The thorn that points backwards 'hooks' the spirit, and the thorn pointing forwards leads the way home (Sinegugu Zukulu. June 2010)

'Umdlebe" is a tree that sometimes has a thirst for blood and when it does so, it can kill anything in the vicinity. When it 'bleeds', that is when red sap comes out, that is a sign that it is looking for blood. One will find many bones of dead creatures that the tree has killed around this tree. The tree can even kill people. The bark of certain trees can bring good luck and happiness, and the bark of other's can chase away evil" (Youth Group, Nonjojo, June 2010).

The Euphorbia is a sacred tree with special powers. If people hurt a Euphorbia and make it bleed (sap comes out) then they must pay it compensation in the form of white (silver) coins or white beads. White signifies purity. When twins are born, it is traditional to plant two Euphorbia's behind the homestead, one for each twin. The twinned Euphorbia have a special relationship with the twins. If one of the Euphorbia sickens and dies, this is a sign that one of the twins will die. By treating the Euphorbia's well, one can try and ensure that the twins thrive and both survive.
Twins are considered special gifts from the Ocean. For this reason twins should not swim in the sea without first giving an offering of white coins or beads to the Ocean to placate it. If this offering is not made before the twins go swimming, then the Ocean might claim back its gift of twins.

It is important to respect the Ocean and the things of the Ocean. Shells can bring protection against hailstorms. The shells scattered around the homestead and in the fields have the ability to drive away hail (Mthambalala Farmer. March. 2010)

Figure 29 & 31. Umzi with twin Euphorbia's planted behind, signifying a birthplace of twins

When people do not respect 'Abantuwelanthwe' (People of the Sea) this can cause vicious storms like the ones that occurred in Kwazulu- Natal a few years ago. Those storms were caused by people upsetting the Ocean by catching and killing mermaids. The mermaids were caught because people insisted on fishing with beef bait that attracted the mermaids. When the mermaids were caught and killed, the Ocean extracted revenge by sending battering, destructive waves and fierce storms onto the shore that destroyed valuable property" (Mthambalala Farmer, June 2010)

Was there a meaning behind this story, I asked?

"The story behind this story is that people upset the natural balance of things by doing things in unnatural ways. Doing things that go against nature will result in having to pay a price when the natural world seeks revenge".

4.2/3 – 10 The Use of Sleds

Beinart (1979) argues that although ploughing introduced the widespread use of draught cattle to Pondoland, the use of wagons never caught on and the wooden draught pulled sled remained the favoured means of haulage over the rough terrain. To this day, sleds still remain important vehicles for carrying heavy loads.

"We prefer sleds because they can go anywhere and do not get stuck like vehicles. They can go over narrow tracks through the forests, and over rocks and up and down steep places". (Mens Focus Group discussion, Nonjojo, March 2010)

Sleds are used for hauling a number of different materials, including thatching grass, building materials, firewood, water containers, manure for field fertilization and harvests, and occasionally sick or injured people. There are a number of variations of sleds, with open sleds used for carrying wood, and closed sleds for harvests and manure. Although the basic structure of sleds is similar, the materials they are made from differs in different places, depending on the local availability of resources and the skills of sled makers.

Figure 30. An umzi with its cattle and grain harvest sled upside down in storage.

Figure 31. Donkeys hauling water in a woven grain harvest sled.

Figure 32. Oxen and wood haulage sled. Sigidi

Figure 33. Slatted sled for hauling building materials such as clay bricks. Sigidi

Figure 34. Closed slatted 'harvest' sled (background) and open 'wood haulage' sled (foreground). Sigidi

4.2/3 – 11 Traditional Pondoland Calendar

Traditionally, the amaMpondo followed a seasonal calendar based on lunar and astrological movements. The calendar determined when certain seasonal cultural rituals would take place as well as agrarian activities. This calendar was narrated by an elder during the course of the bio-cultural mapping workshop and depicts the traditional seasonal activities of the communities who live in the Mtentu area.

Box 22. Traditional amaMpondo Calendar	
Ubusika (winter)	**Roughly corresponding to the European months April, May, June, July**
Ulimo (agricultural activities)	Kuvuwia umbona, nezityala zonke. A time for harvesting all crops, such as maize, beans etc. Also vegetables are planted during winter only in wetlands where there is moist soil. In summer they are planted anywhere.
Imicimbi yesinto (Ceremonies)	Mxesha hemithagi, ngoba akusetyenswa, kuya phuzwa. Kuhlinzwimikhushwo inyamaibolacademgoba kujabanda. Amashawe, amacece, imigubho, imibuyaso. Winter is the time for all cultural rituals and ceremonies as people are not busy in the fields. The cold weather makes it a perfect time for slaughtering as meat may last longer without getting rotten. Ceremonies such as Amatshawe (dances of Elderly men and their mistresses), Amacece (Sangoma ceremonies and dances), Imigubho (Rites of passage ceremonies for girls when they come of age), Imibuyiso (bringing of spirits of the deceased to new homesteads - to Buyisa is to bring someone back home). This is the ceremony where the buffalo thorn is used.
Indalo (natural events)	Kukhoamantsontswana. Amashede. Uhlaza uyanhela keyihashe, kuphuwa untloyishe keyihashe, kuphuma untloyishe July-August is the time of the sardines, they come out of the ocean accompanied by shad fish which people enjoy catching so men are often out fishing. The green grass becomes very scarce. Beginning of August starts the windy season which is referred to as Untloyile- "The coming out of the Yellow Billed Kite". There is a belief in Pondoland that the yellow billed kite hibernates during winter, and looses all its feathers and stay in caves. Beginning of the warm season its feathers grow back and it

	comes out of hibernation beginning of August on a windy day. Hence a windy day is referred to as the coming out of |Ntloyile. Normally children keep all chicks indoors as this bird comes out very hungry and kills lots and lots of chicks. The time of watsonia's.
Amagwaqani (Weather)	Kuyabanda, kunomoya onmizi, konusile. It is very cold, windy, and it is dry.

Inkoyanko or Intsungulo (This season has no European equivalent)	**Rough correspondence with August/ September.**
Ulimo (cultivation)	Kulinywa emichatyeni, amadumbe, imbotyi yokupala, kuyaPhenoluluwa (soil preparation), amazambane. This is the beginning of ploughing season. It is the starting of planting season. Only small fenced fields in front of the homesteads are planted. Planting happens in wetlands, madumbes (yams) planted mainly in June-July, beans (first bean crop), fields are ploughed (soil preparation) after July or August rain. Potatos also planted around September-October.
Imicimbi yesinto (Ceremonies and rituals)	Umembuto, amacece. End of bereavement ceremony or changing of bereavement clothes, the coming out of training of Sangoma.
Indalo (natural events)	Imbaliziyadubula equndeni, omopiyo. Flowering of most plants, certain plants start flowering. mushrooms appear. Watsonias flower.
Amagwaqani (weather)	Seleqabile ukuphazima izulu, liyakhumezela Thunder and lightning starts

Intswasa-hlobo (Spring)	**Roughly October to December**
Ulimo	Ubhatata, imbotyi, amazimbo, umbona, kulinywa emasimini: People start working in the fields everywhere, very busy. Sweet potatoes, beans, soghum, maize, big open fields are being planted.
Imicimbi yesinto	Umembulo, amacece. Removal of widow clothes or bereavement clothes, Sangomas come out of training ceremonies.
Indalo	Kuhle uhlaza lugqasile, kudubule injomi, izivilo, izikhamango. There is greenery everywhere, wild fruits such as water berries and strelitzia are flowering
Amagwaqani	Liyadumo izdulu, kubudume, miyanetha, amazolo There is thunder, lightning, raining, lots of dew in the morning almost daily

Inhlobo (Summer)	**Roughly January, February, March**
Ulimo	Kutyalwa imbotyi, kudliwa umbona, amazambani, umbona uyadliwa, ubhatato uyadliwa. Planting of beans, mealies are being eaten, potatoes are also ready, Sweet Potatoes are ready by March
Imicimbi yesinto	Imigubho nemingquzo, imibuyiso, uthyilomatye, olahisimsi bamabhungu, emebalo, amacece. All rituals and ceremonies are also done around December holidays as everyone is back home.
Indalo	Sidle injomi, inkomanga, inkomba, amavibo, amathangulu. Kuluhboza. Acmbali ziwile. We eat water berries, Strelitzia Fruits, Pondo coconut, Num-num fruits, all sorts of wild fruits.
Amagwaqani	Kuyashisa Imvula gimkula Alango lishonalcade Hot, lots of rain, late sunsets.

4.2/4 Case Study 3. Bio-cultural Mapping Workshop

Figure 35. Sjocolat, a Sangoma in traditional dress, performs a traditional Blessing of the Ancestors at the bio-cultural mapping workshop

Information obtained through interviews, discussions and in-field observation in Sigidi, Mthambalala and Nonjojo has been supplemented by my participation as an observer in a 3 day participatory bio-cultural mapping workshop that was organised by the participatory 'Simbahdame' programme facilitated by the NGO, Sustaining the Wild Coast(SWC) in May 2011. The mapping programme was undertaken to try and highlight local identity in relation to a particular sense of place, and to get some idea of local landscape use and land use changes that had occurred over generations. The aim of the mapping programme was to establish guidelines that could inform local development processes in a way that maintained a local sense of cultural self-identity. Participants were asked to examine the question, 'Who are we and what is important to our way of life?' Places of cultural significance to the local way of life, relevant to this question, were hand drawn on maps. During the course of the workshop over 3 days, participants were asked to draw a map of the past as far as living memory would go, a map of the present, and a map that would indicate what future developments they would like to see in their respective localities. Each group was asked to give a presentation on the maps they had drawn, explaining to the rest of the workshop the significance of their drawings.

There were 25 participants in the Bio-cultural mapping workshop, who were elected representatives from the communities of Sigidi, Mdatya, Mtolani, Mpendweni, amaBaleni and Mtentu. Collectively,

these represent a spread of communities that cover the Pondoland coastal area from the Mtamvuna River to the Mtentu River.   Nonjojo and Mthambalala were not represented in the Bio-cultural mapping workshop as they are from a different district to those who participated in the mapping workshop. As an invited observer, I could not dictate who would be present at the Bio-cultural mapping event.   The participants in the bio-cultural mapping workshop were elected by the communities they represented to participate in the workshop. Each participating community was invited to send 5 representatives to the mapping workshop, with different representatives selected from different community stakeholder groups. Stakeholder groups included, but were not limited to, church, local government, youth, women, special community interest groups, agriculturalists and anyone else that communities had a special interest in sending. In the event not all the communities sent a full quota of 5 participants, which accounts for 25 participants, rather than 30.

4.2/4 -1. Presentation of findings for the bio-cultural mapping workshop.

For these findings, I have presented an edited version of each community's presentation about their maps, and a photograph of the relevant maps. I believe the community presentations speak for themselves, so I have limited my commentary to discussion in the following chapter. Readers please (Note, the following commentaries should be considered in reference to the attendant maps)

Figure 35. Key to Maps.

Box 23. Mabaleni Community.

See figures 42 and 43

Traditionally, cattle pastures were near the rivers. The water from the Goboto River was used for cattle, as it has sacred and healing properties. Long ago people stayed near their relatives, not scattered about like today. The community has grown. There are new roads for spaza shops. The fields for sweet potato and mealies are different, because these crops need different soils. The fields are above and below the roads. The roads are good to have, but the fields keep us full so the roads must be built below or above the fields. The fields were bigger in the past, but there were far fewer of them because there were far fewer umzi. There are many more homesteads now, so the fields are smaller, but there are far more fields to accommodate more homesteads. In the past people used to rely totally in the fields for food, but now they are not so reliant on the fields as there are more stores - and people like to eat rice. The area the community covers has expanded as the community has expanded. We are much bigger so we take up more land area.

Wild pigs are a nuisance. They mess the fields near the forest so we can't plough near there. Our firewood comes from the forest because we have no electricity. We have to be careful what we do at the stream headland, because it mustn't mess the water for the cattle.

In the future we would like to see more connection between us and neighbouring communities, because what happens there also affects me. It does not help if I try and upgrade myself or look after my environment if I don't include the neighbours. It needs communities on both sides of the river to be involved, if a river is to be maintained properly.
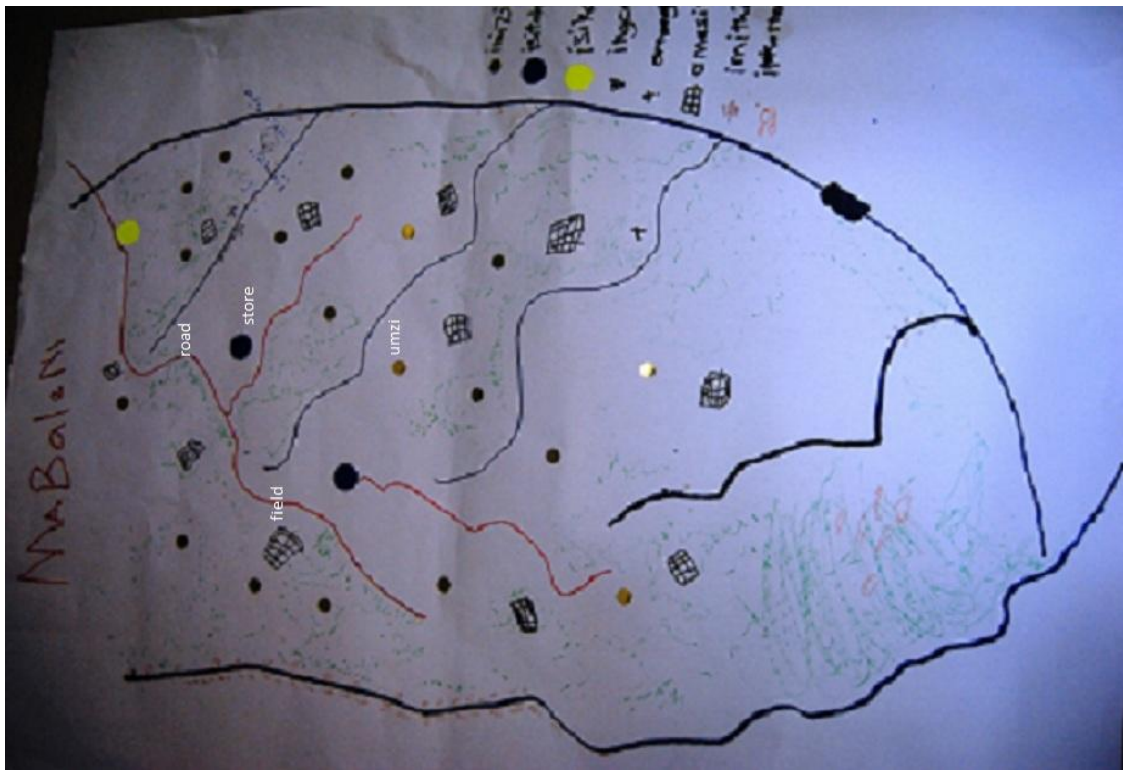
Figure 36. Mabaleni map of present

Figure 37. Mabaleni map of past

Box 24. Mtentu/ Nyavini Community

See Fig. 44 -45

The 'Isiziba' (sacred river pool) is inhabited by 'Inkomo Yamanzi'(see explanation further in text).
The Isiziba is still at the same place.

This particular mountain was revered as a sacred place were prayers for rain used to be offered. This is no longer done.

The burial grounds of our Ancestors are in the caves in the hills. These are still there. Nongoma, an Ancestor 'Inkosi' for this area is buried here, but people no longer 'hlonipha' (revere) the burial site. People are no longer buried in caves in the hills, but are buried near their umzi.

There has been a large increase in the number of houses, especially inland.

Many streams have much less flow. The gum tree woodlots suck up the water and finish the stream. We look after the trees because they help keep us healthy. We use trees a lot but gum trees suck up the water which affects the fields. The water will all be finished if people do not use it wisely. Some area's that were once umzi and fields are now forests. People used to clear the forests to make fields, but they no longer do that and the forests have re-grown.

The sea is very important for the people who live close to it. They catch fish and shellfish for meat, can wash in it, and it also has health and healing purposes.

This is Fourteen going to work taking hikers along the coast. We like 'ugudlalwandle' (hikers) .This red hill is degraded by tourists driving motor-bikes and quad bikes over it during holidays. We do not like quad bikes and vehicles driving all over the land.

There is no dip for cattle here, and we have to drive our cattle to Mtoleni for dipping.

In the future we would like the dune degradation stopped. We would like to set up a caravan park and specific parking area and control the driving of vehicles all over. We would like the bad patch of road concreted. We would like to revive the community gardens and have gardens that are large enough to feed everybody in the community. The gardens we have are too small for everybody.
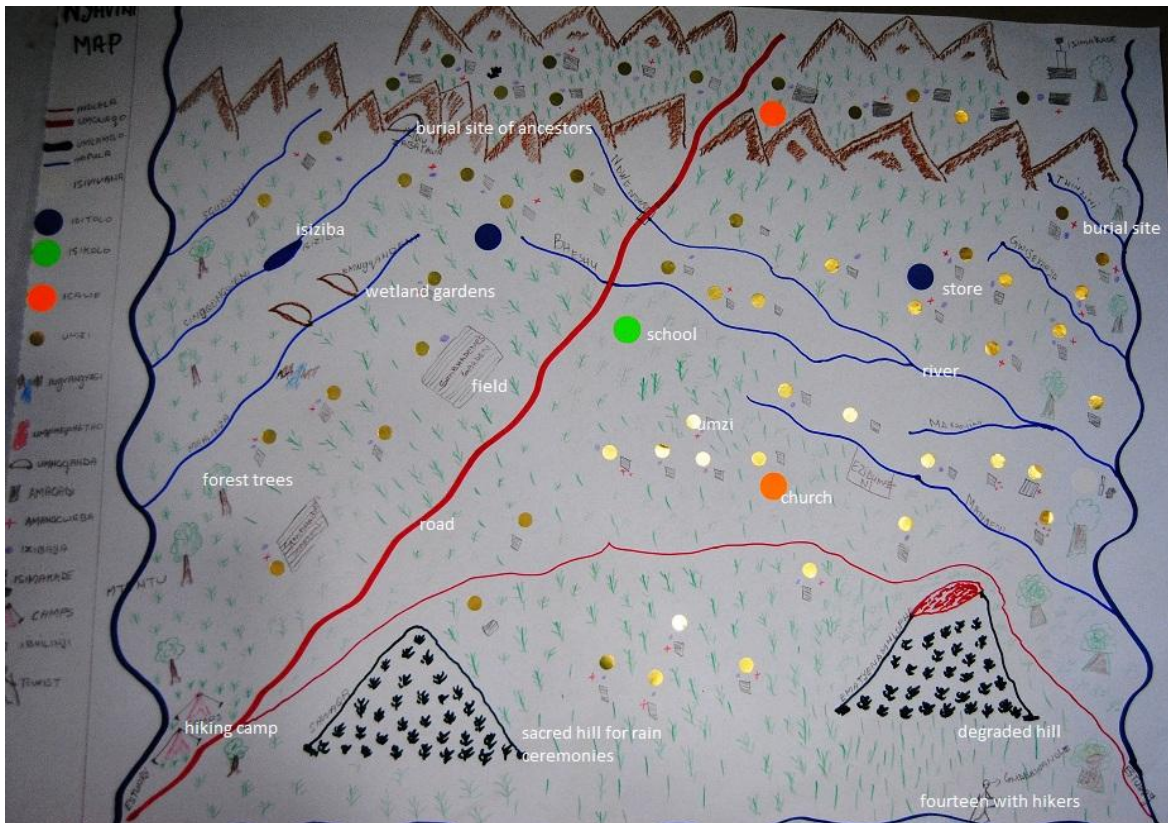
Figure 38 Mtentu/ Nyavini map of present. Text overlain by Valerie Payn

Figure 39. Mtentu/ Nyavini map of past

In Pondoland there are many stories of mythical creatures in association with particular forests, waterfalls and rivers. Inkanyamba is a monster magical snake with seven heads that lives in certain rivers and river pools. There are many associated beliefs around the behavior of Inkanyamba and human, animal and natural events. Inkomo Yamanzi (Wild River Ox) is a creature that takes the form of a wild cow, and that lives off Inkukhu Zesiziba (magic chickens). Inkomo Yamanzi and Inkukhu Zesiziba commonly stay in the vicinity of Inkanyamba, so "*this means everywhere you see these Inkanyamba is hiding in that river*". Tradition is that if one has a domestic cow or ox that behaves in a wild and uncontrollable manner; this is because it is the offspring of a mating between ones domestic cattle and Inkomo Yamanzi.

At Alice Falls at Magwa, local tradition is that a herd of Wild River Cattle (Inkomo Yamanzi) live in the pool below Alice Falls, together with Abantubomlambo (People of the River). Abantubomlambo can be communicated with by select Sangomas' who have mastered the art of breathing underwater, but if normal people dare go into the water at Alice Falls pool, they will be kidnapped by Abantubomlambo and never be seen again.

Box 25. Mtolani Community.

See figs. 47-48

The fields are no longer as fertile because we have no money to buy fertilisers. We plant with manure, but fertilisers messed the fields. Long ago we planted with manure. We have many good trees that follow the course of the river.

In the future we would like electricity and cellular network connections, a clinic, and an improved church hall and our own church. We would like work related to planting trees and greening the degraded dunes.

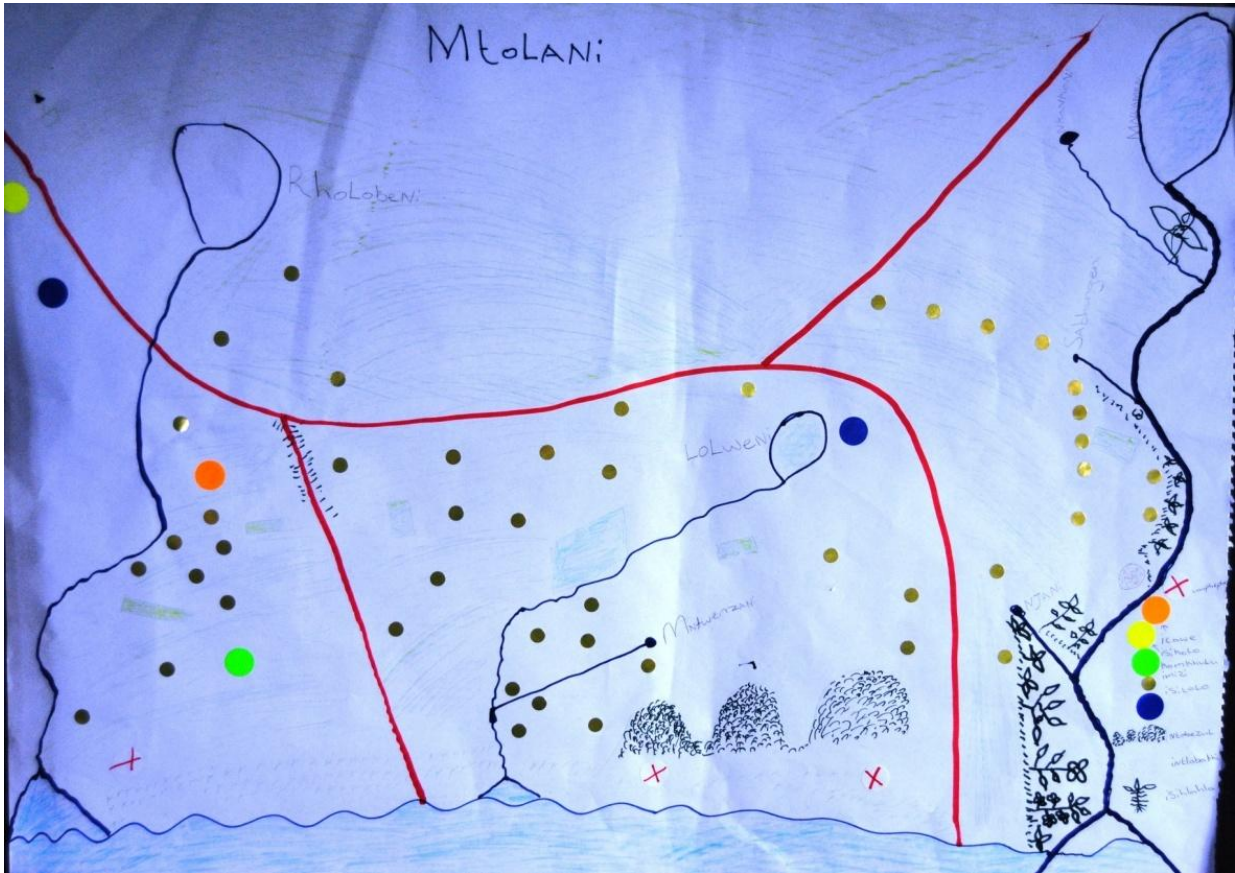**Figure 40. Mtolani map of the past**

Figure 41. Mtolani map of present

Box 26. Sigidi (formerly Luphithini) Community

Figs. 49-50

We have one church in a homestead. These are the fields where we grow sweet potatoes for sale. The rivers help us a lot. They collect all the water when it rains so that we don't get flooded out. There are some gum trees in our area, and people also get fish out of the sea.
We have included a traditional beehive house in our map, because before people built rondavels, they would build beehive huts. Now they are building square modern houses. This shows how the fashion of houses changes.

In the future we would like to see an improved school and clinic, and a road that goes right to the beach as now the road only goes as far as the school. We would like a bridge across Mzamba River and planting vegetation along the coastal dunes.

Box 27. Empindweni Community

Figs 51-52

Our fields are next to our umzi. Long ago we only had one school and one store, now we have a church and a hall.
We don't have trees that eat the water (Gum trees- Eucalypts). Some of us like to look after the trees but some people don't have ears and still fell the trees. The water is normally clear but if it isn't it is because a cow would have got in and muddied it. We drink the same water as the cows but it doesn't make us sick as it is fine. We don't have taps. We rely a lot on indigenous medicines from local plants. There is a new church that has come to the area. Some of us are concerned that too many churches will split the community up.

This area is kept uninhabited and there are no fields here either. There used to be a few houses and many fields there, but there was no road so the houses moved to be closer to the road and now this area is used for grazing because there are no longer houses or fields there. The houses and fields moved into an area that was previously kept aside, unoccupied for grazing. In the old day they didn't burn the veldt as furiously as they do these days.
In the future we would like to see some community campsites developed for hikers and tourists along the coast. We would like improved toilets and roads and a footbridge linking us to Mkwanana. We would also like to reforest the dunes that are degraded.
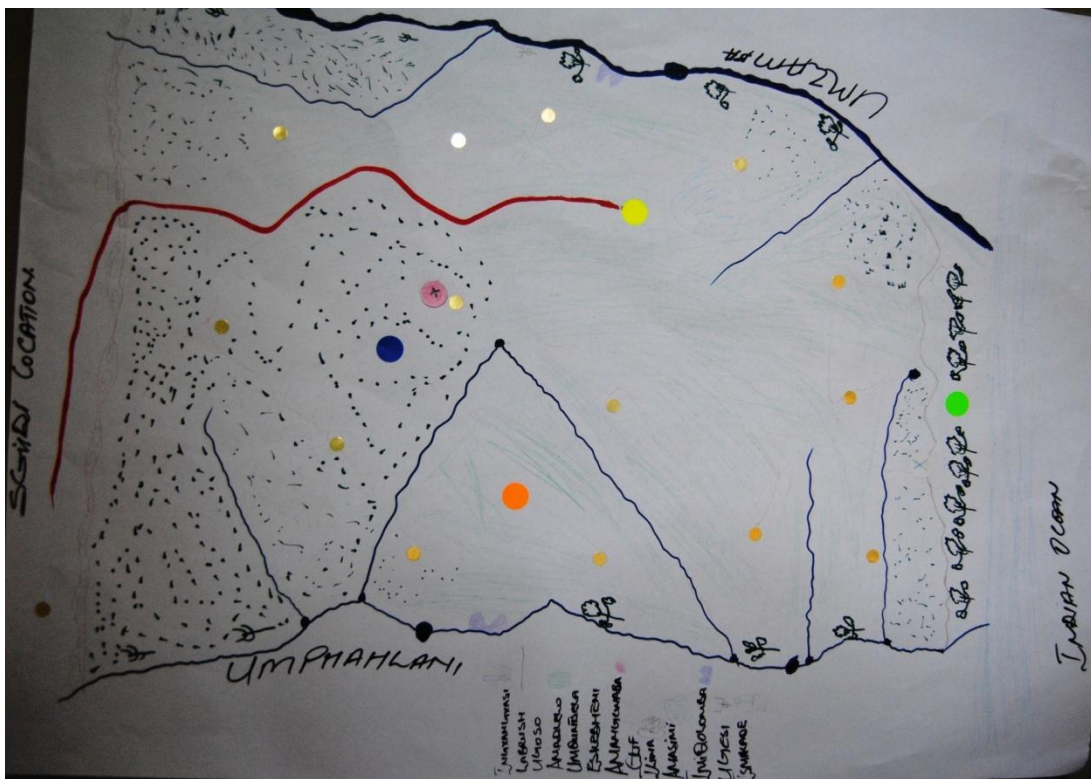
Figure 42. Sigidi map of past

Figure 43. Sigidi map of present
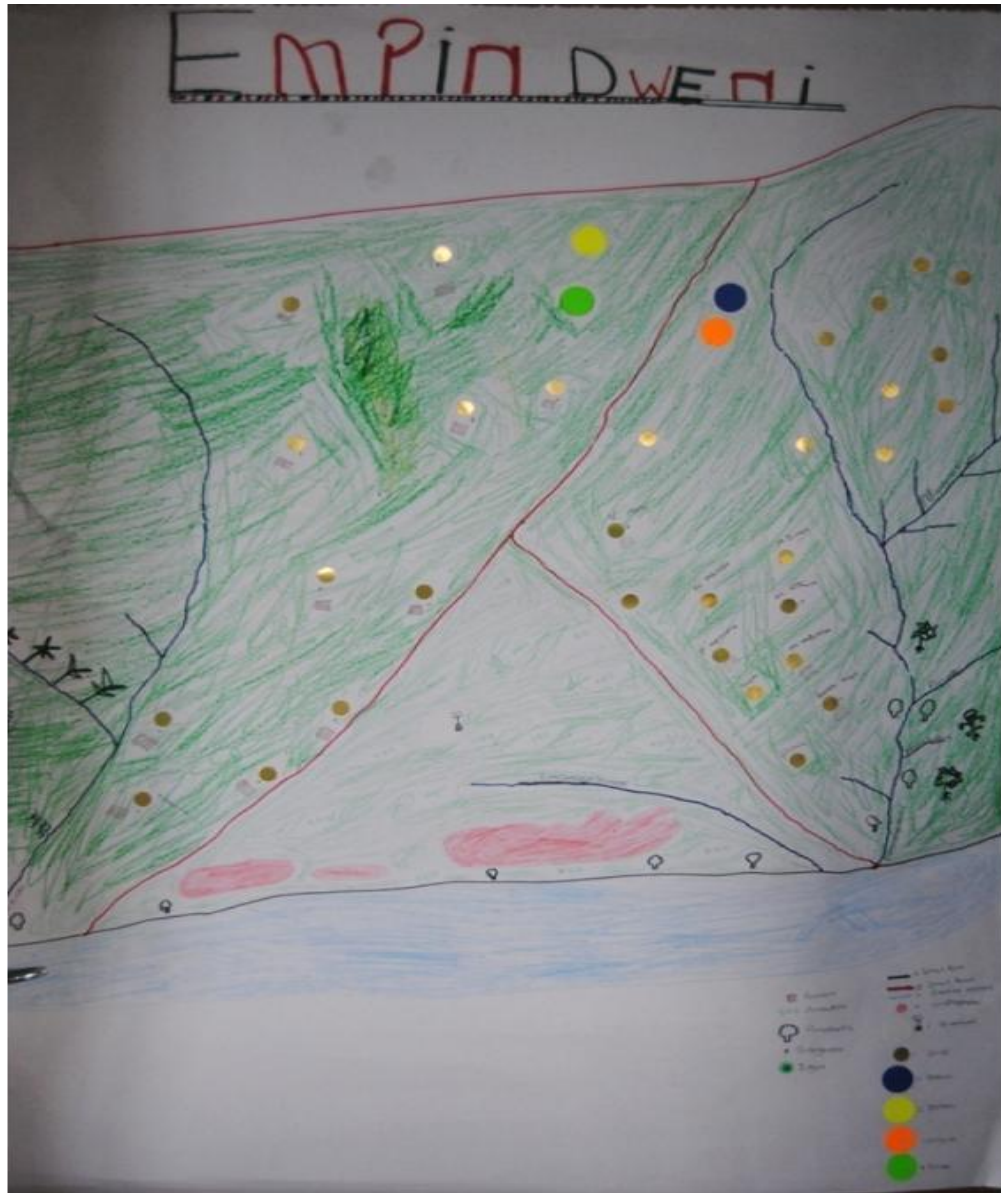
Figure 44. Empindweni. Map of the past

Figure 45. Empindweni map of the present

Box 27. Mdatya/ Mndalmeni Community

Figs. 53-54

The past name of Mdatya was Mndlameni. This was also the name of the big river that went into the sea. The Umphahlane also ran into the sea. The area in between was all one. There were forests all along the coast dunes. The fields in the past were ploughed by oxen. There were Inkukhu Zesiziba and Inkomo Yamanzi in the forest. People did not swim but now they do. Our Inkomo Yamanzi and Inkukhu Zesiziba are not seen very much anymore. The grass cutters say they don't see them anymore. There is a lot of activity and burning around that part, disturbances to the environment and people do not 'hlonipha' these places anymore - no more respects given there so perhaps that is why these creatures are not there anymore.

Each house had its own fields. The River tributaries had forests and there was Inkomo Yamanzi in this river.

There are roads now. This road is new.

We have caves which used to be places to gather the cattle. White people like to camp in the caves now and swim in the pool near the caves. Long ago people also lived in the caves. In that pool there is Inkanyamba. White people put money in the water to appease Inkanyamba before they swim so they can go in without harm.

The fish in the sea help us when we are in need of meat.

There are lots of houses now. People have their own homes now. The quality of our grass has changed. People no longer put out fires and they are destroying the environment, that is why no trees.

In the future we would like to see an improvement in our schools and churches, our own crèche, better police protection for our schoolchildren, and a clinic in our district. We would like help with fencing our gardens and fenced grazing lands. Our trees are finished; we need fire protection and fire guards and more control over trees which are being over-felled. We would like to establish controls over the grass cutting season to prevent people from cutting grass in the wrong season. We would like see the establishment of protection bushes along the coastal area and campsites for tourists.
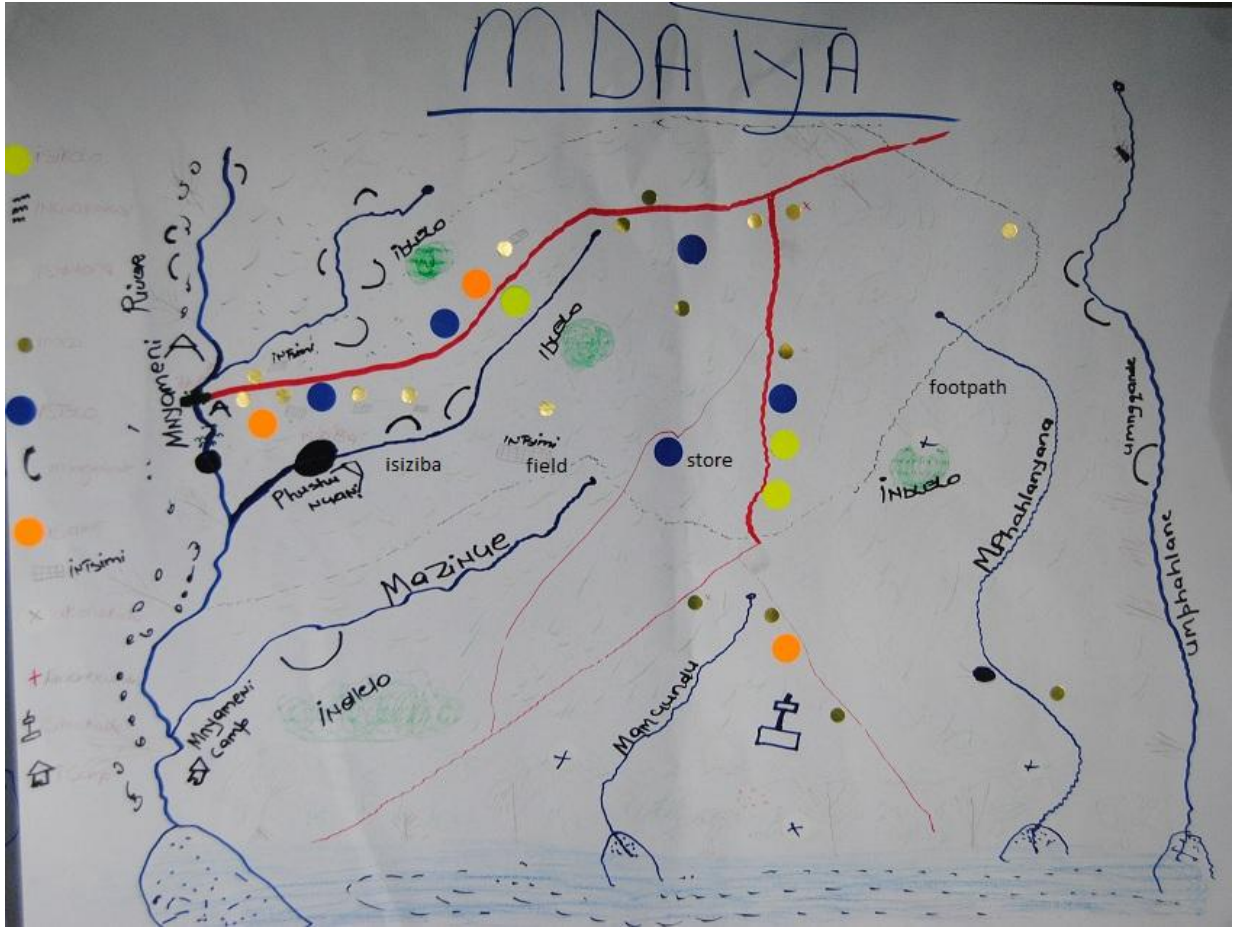
Figure 46. Mdatya map of present

Figure 47. Mdatya map of past

4.2/4-1 Summary of observations, Bio-cultural Mapping Workshop.

The Bio-cultural mapping workshop raised a number of issues. The mapping workshop is considered by SWC to be part of an ongoing process of local cultural and environmental awareness raising, linked to the creation of a participatory and supportive programme for local livelihoods development. In this context, I am aware that there are many elements that have been drawn on the maps and raised in the presentations that have a past history and a future that require further investigation and discussion, but time constraints, logistics and the limits of this thesis have precluded me from investigating these as part of this thesis.

Nonetheless, for this thesis I believe the Bio-cultural Mapping Workshop presented valuable insights into a perception of landscape through local eyes, in highlighting various changes that local people have noticed within that landscape over time, in helping to link landscape change to socio-cultural change, and in helping to formulate the sorts of developments that local people prioritize.

 Briefly, common themes that emerge from the mapping workshop include local concerns about the impacts of environmental degradation, including over-burning of veldt, water quality, over-felling of trees, maintenance of soil fertility and dune degradation, links between sense of cultural identity, spirituality and various sacred places in the landscape such as isiziba, sacred places and burial sites, and a sense of realization that it requires communal participation to maintain an environment. When taken as a whole, these suggest these communities have a strong sense of place and feeling of relatedness of community to a particular landscape environment. Consequently, that there is a strong awareness that environmental degradation has potentially adverse impacts for human well-being, domestic livestock as well as 'spiritual' animals such as *Inkanyamba, Inkomo Yamanzi* and *Inkukhu Zesiziba*, and that this is related to a lack of respect *(hlonipha)* of the total environment.

One of the most notable features of the maps, which are also commented on in the map narratives, is the increase in the number of umzi, roads and stores in the communities over time. What is not so clear from the map presentations is if there is an awareness of whether, or how, physical changes to the human environment (such as roads, stores and more *umzi)*, might be related to changes in socio-cultural value systems, tradition and customs that have led to reduced *hlonipha*. It is also not clear whether there is an understanding that increases in the size of communities might be related to environmental degradation as a consequence of increased demand of resources such as timber.

These implications of these issues will be discussed in more detail in the following chapter.

CHAPTER FIVE: SUMMARY OF KEY FINDINGS, AND DISCUSSION

5. Section 1: Key Findings

These are the key issues that emerge from this thesis research.

Although there are certain culturally derived similarities between agricultural practices and land use in the communities investigated in this thesis, there are also significant differences between communities that suggest that any deep understanding of the relationships between land use practices and culture requires a context related approach that is rooted within particular place.

Across all communities, securing household food security was the primary motivation for agricultural activities. Organically based methods of agriculture are the traditional norm. I found strong relationships between agricultural practice, traditional cultural practices and systems of land use, and traditional knowledge and belief systems. In all communities a wide diversity of food crops was grown. Although crops were grown primarily for household consumption, in some instances excess produce was marketed. In all communities, women played a key cultural role in household food provision through agricultural and gardening activities.

In different regions, differences in agricultural practice seem to be related to varying geographical conditions, although local cultural differences also seemed to play a role. More research is needed to qualify the relationships between cultural variations in land use practices and geographical differences.

I found a strong indication that inter-generational changes to social value systems have influenced agricultural production and land use practices. In many instances, declines in agricultural production, and increasing ecological degradation, appear to be connected to declines in traditional cultural customs and practices associated with traditional land care and agricultural practices.

Amongst all communities, there was a strong recognition of high dependency on natural systems, but the capacity to monitor and react to ecological degradation seemed to differ amongst communities. Those communities that showed a strong sense of communal cohesion seemed to show more willingness to take communal responsibility to counteract negative social and ecological influences.

These findings suggest that, amongst the traditional amaMpondo communities who took part in this study, there are strong local inter-connections between agriculture, culture, and ecological systems, with changes to any one of these systems having repercussive effects for other inter-related systems.

The following sections of this chapter elaborate on these key findings.

5.1/ 1 Agricultural practices

Amongst all communities agricultural and gardening activities are primarily undertaken to ensure food security, although some farmers supplement their income (apparently quite substantially in some instances) through small –scale commercial farming activities such as selling sweet-potato and fresh sugar- cane stalks. Both agriculture and gardening are seen as important activities in a household's ability to survive, particularly given the low rates of formal employment. Even youth who see agriculture as a last option if no other opportunities are available see value in the food self-sufficiency it provides. This finding contradicts those who discount the importance of subsistence agriculture in the rural economy (Sansom, 1974; Wood and van Schoor, 1976; Berstein, 2005, Cousins, 1999) and supports the views of those who suggests that unaccounted for value may mean subsistence agriculture makes a greater contribution to local livelihoods productivity than is generally acknowledged by official GDP and employment figures (Shackleton et al, 2000; McAllister, 2000). An alternative reading is that households pursue other livelihood options if possible, as well as continuing to value the importance of food provision through agricultural and gardening activities.

However, narratives do indicate that total dependency on home grown produce, and hence food self-sufficiency, has declined with increasing access to store bought products, and this is inter-connected to increased household dependency on a monetary economy. This lends support to Cousins (2007), McAllister (2000) and Andrews at al (2003) who suggest that the focus of local agricultural production has shifted.

Farmers grow a wide diversity of crops, over a long cropping season. Poly-culture is the preferred way of growing most crops, although 'modern' crops are sometimes planted in rows. The maize, beans, pumpkin poly-crop system is universally favoured, as are the traditional cultivars of these crops. However, the range of crops grown differs in different regions, with Mthambalala, Nojojo farmers growing more varied crops than in Sigidi. This may be a consequence of geographical differences, and requires further research. Farmers take care to keep the best maize cobs for seeds for replanting from year to year, while the seeds of other traditional crops are also kept for replanting.

With what are considered 'modern' crops, such as various vegetables like cabbage, carrots, beetroot, the purchase of commercial seedlings or seeds is favoured if money is available, although farmers also exhibit an extensive curiosity about how the seeds of these crops can be saved and re-cultivated.

Crops are fertilized primarily through organic means, using manures, ash, composts, mulches and the reincorporation of vegetation matter such as old crop residues into the soil. However, the method and intensity of fertilisation differs in different communities. This requires further research as the reason for these differences are not clear and may be related to local soil conditions, or to local knowledge

systems. Pest control is retro-active, with crops being treated once signs of pests are noticed. Powdered commercial pesticides sprinkled directly onto crops are favoured for pest control.

Cattle and other livestock are an important component of the farming system, used for draft, ploughing and for fertilization through manure. Cattle and other livestock are also important for cultural reasons, being used in various cultural rituals and ceremonies. Cattle are universally considered men's' responsibility. In some communities, declines in herding traditions mean people desire fencing around their fields, although in other places herding responsibilities still seem to be taken seriously.

Women are highly involved in gardener-farming activities, although some men also participate in cultivation of gardens and fields. The coherence of gender relationships and inter-gender relationships appears to vary in different communities, and the state of these relationships appears to have consequences for agricultural activity.

Although some farmers expressed a wish to commercialize further, I could find no relationship between gender, age or community structure in those farmers who desire increased commercialization, so conclude that this desire is driven by individual interests and ambitions. What is noticeable, however, is that the youth in Nonjojo expressed a lack of interest in agriculture as a career goal because of its poor ability to generate income, in contrast to older farmers who expressed pride in the self-sufficiency that agriculture enables. Lack of suitable market infrastructure, suitable government support, and viable pricing for produce are seen as primary hurdles to commercialization, although lack of fencing is also a concern.

5.1/2 Agriculture and Cultural Tradition

Changing food tastes are related to changing agricultural practices. Maize is no longer a favoured food staple, and has been replaced by a preference for imported rice and pasta. Maize is now grown primarily for green cobs, to prepare some traditional dishes still used in rituals such as traditional beer, and for livestock feed. The loss of traditional practices such as storing maize in izisele has meant a loss of ingredients for particular dishes.

The elders all commented on a decline in agricultural production. The causes of these were numerous, and included changing food tastes, changing values particularly amongst the youth, increasing materialism requiring an income to buy products, the attitudes of the youth, declines in agrarian tradition and customs such as herding, decline in the practice of ilima and women's traditional role in

food provision and agriculture, reliance on social grants that meant people were less reliant on self food provision, poor market opportunities and poor product prices, and declining soil fertility.

Declining soil fertility is often blamed on the use of commercial fertilisers which destroyed the soil, although there were some contradictions as some participants indicated that the exorbitant cost of fertilisers meant they could no longer buy these, with implications for productivity. These contradictions raise the question of whether farmers feel that soil degradation through fertiliser use means that they are now reliant on the fertilisers that originally destroyed the soil. More research needs to be conducted around these perceptions. Selection for umzi sites based on cell phone coverage, rather than on earthworm activity, might also be a factor in perceived declining soil fertility. Although Nonjojo and Mthambalala farmers said that some people were forced to build on steep slopes as a consequence of population density, it is also possible that a preference for steep hilltop sites might be linked to cell phone coverage. Connections between siting of umzi, soil fertility and crop production, and cell phone coverage needs further research.

Farmers learnt to farm primarily from their parents, following traditional practices. The preference for farming ' the way we learnt from our parents' is expressed despite an acknowledgement that some farmers 'know about other ways of farming'. Even youth who said they took agriculture as a subject at school said that for traditional crops they would use traditional polycrop methods that they learnt from their parents, although for 'modern' crops *'you should plant in straight rows of you want a good crop'*.
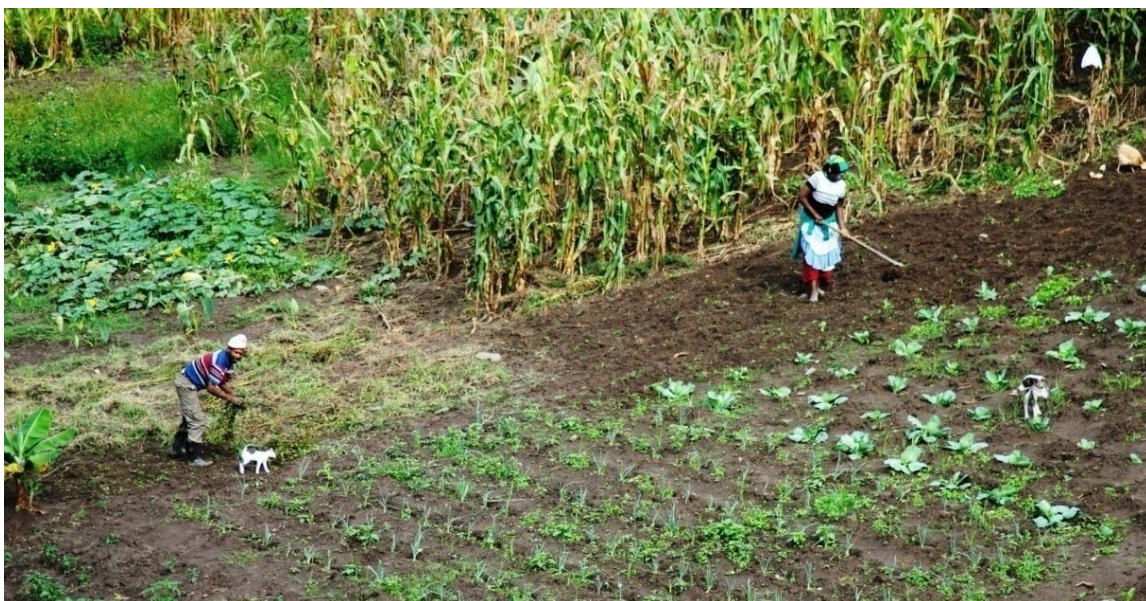
Figure 48. Garden photographed near Ntafufu turn-off on the way to Port St John's, where 'modern' vegetable crops are being planted in rows, while the traditional crops of maize and pumpkin are scattered and polycropped.

5.1/3 Land Allocation

Sites for umzi, gardens and fields are allocated through usufruct, through the permission of village headmen. Usufruct is granted upon need. Property granted through usufruct remains in a family as long as that family has need of it.

For cultivated areas, distinctions are made between gardens and fields, based upon the nature of the crops grown, the size of the area, and fencing. Gardens are fenced and used to grow a variety of vegetable and fruits, while fields are unfenced and are generally larger than gardens. The tradition of unfenced fields means that responsible livestock herding is required in order to ensure crop cultivation.

Large areas of the landscape are left in a natural state for use as commonage for grazing and natural resource harvesting. While some communities seem to have agreed arrangements for managing some natural resources, in other communities' responsibility for natural resource management seems to have been abrogated to government agencies. Some comments suggest communal conflicts of interest between those wishing to put in place improved land care management systems, and 'people without ears' who disregard these.

In Sigidi, farmers said they did not agree with the idea of land being commoditised, while Mthambalala and Nonjojo farmers mentioned their land was granted for free. The impression I had was that farmers saw the communal systems of land allocation as an advantage, as it meant they did not have to buy land in order to farm, and that the traditional system of usufruct meant even poor people could have access to land.

5.1/4 Natural Resource Use

All communities recognised high dependency on natural resources. The women of Nonjojo said they would die without the forest. In Sigidi, farmers were adamant that their way of farming required a limited population and expansive land so that the land would not become 'over-used'. Forests, rivers, wetlands and grazing lands are all considered important resources for human and domestic animal welfare, and are important elements in the agrarian system. Local natural resources are used as building materials, for fencing, for medicines (of both a chemical and spiritual/ magical nature) and in a number of crafts such as sled making, basketry, and mat weaving. These crafts provide utensils for household and agricultural use. These utensils also often have association with cultural traditions and rituals, such as the use of 'isithebe' at 'ilima'. All communities depended on untreated water from rivers, streams and other natural water sites for consumption, so appeared highly concerned about the water quality of these. Rivers are often used to demarcate communal boundaries.

5.1/6 Common Concerns

Many communities show concern over ecological degradation. These include the effects of invading alien plants on forests, grasslands and water flows, uncontrolled burning affecting the quality of veldt and forests, tree over -felling, tourists with vehicles driving over the land, declining soil land fertility, that human activities had disturbed the presence of mythical creatures, and the lack of respect shown to special places. These concerns vary between communities. Communities recognise that ecological degradation has implications for their own well-being, given their inter-dependence on grasslands for grazing, forests, water resources etc. Where signs of ecological degradation have been noticed, communities express a wish to reverse these by re-vegetating dunes, tree planting and improved controls over burning, unseasonal grass cutting, tree-felling and watershed management. Although all communities seemed to be aware of ecological degradation when it occurred within the immediate vicinity over living memory, the aerial mapping study from the Institute of Natural Researches suggests that in some instances long term change to the environment may be overlooked by community perspectives (also refer 5.2/3).

The elderly are concerned that cultural traditions, sense of pride in agrarian self-sufficiency and value systems are being undermined by modern developments and that traditions are not being passed onto the youth. Youth show concern over viable opportunities to earn an income. Many said they would value agriculture more as a livelihood option if it could be more profitable.

There were widespread concerns that government agendas did not meet or understand local needs, and that government decisions are commonly made without adequate consultation or understanding of local contexts.

5.1/7 Beliefs

Certain places within the landscape are considered to have 'special' or 'sacred' qualities that ought to be revered and respected. Special places are locally associated with mythical creatures, burial sites, or sacred sites used for ritual or offering prayer. There are widespread beliefs that disturbing natural ways will have consequences, which manifest in tales such as the mermaid story, and the belief that disturbing the mythical creatures that inhabit certain places, such as through swimming or too much human activity, can have adverse implications unless offerings are given to these places. Places associated with water, such as the ocean, waterfalls and rivers, are particularly associated with spiritual beliefs, mythical creatures and having healing properties. Many wild plants are considered to have special medicinal or spiritual powers, and are harvested or specifically cultivated in association with these beliefs, such as the association between Euphorbia's and the well-being of twins. Natural

resources are commonly believed to be for 'the benefit of everyone', with use based on need, not greed and having a strong sense of communality, participating in community and sharing with community, are considered a socially highly respected traits. The combination of these beliefs indicate a broad awareness of inter-relationships between human well-being and nature, where the 'unnatural' disturbance of nature has human implications. Recognised relationships between the state of the environment, and the existence of various 'spirit' animals suggests that ecological imbalance might also be perceived as creating spiritual imbalance, and the holistic nature of Ubuntu and Ukama would support this theory. However, more research is needed into this theory to draw definitive conclusions.

5. Section 2: Commentary and Discussion

5.2/1 Relationships between Landscape Characteristics and Land Use Patterns

The broad traits shared by traditional amaMpondo communities give rise to certain common definable landscape characteristics. These traits include a distinction between gardens and fields, the allocation of allotments through village headmen, recognised areas of commonage that are left in an uncultivated state, reliance on a wide variety of natural resources, and a preference for dispersed patterns of settlement with recognisable vernacular architectural styles in which locally available materials such as clay, timber, cow manure, grass and reeds are extensively used. Vernacular building styles and human settlement patterns contribute to the distinct 'sense of place' of the landscape. The recent addition of rectangular 'modern' square buildings into umzi, reflects changing cultural taste, changing value systems, changing customs and changing technology. This vernacular landscape heritage is an expression of the inter-relationship between cultural knowledge, skills, values, social structure and local resource use.

Traditional practices of setting aside areas of commonage for natural resource harvesting and grazing means that cultivated allotments, such as fields and gardens, sit within a mosaic landscape of forests, wetlands, and grassland. Although these have a value in terms of socio-cultural use, they also present a diversity of natural habitat types. The continued existence of a diversity of habitat and land use types within the cultivated landscape, means that traditional patterns of land use lend themselves to sustainable land use practices where a range of habitat types within a mosaic agricultural landscape matrix are considered a positive factor (Perfecto et al, 2009).

Although the landscape is extensively utilized, and has seen human occupation and agrarian activity for at least 500years, if not longer, traditional systems of land management and use must be given at least some credit in conserving the high levels of plant biodiversity that have seen global recognition

of the area as the Pondoland Centre of Plant Endemism (PCE). Indeed, if the Total Human Ecosystem (THE) is a consequence of co evolutionary processes between human activity and ecological conditions, an important question is whether traditional methods of land use, including extensive use of commonage left in a natural state, may have contributed to creating the particular conditions that have given rise to the biotic distributions of the PCE?

5.2/2 Sustainability of Farming Practices

Traditional farming practices share many similarities with well-recognised agroecological practices (see section 2.1/12; Mollison, 1990; Altieri, 1989; Lampkin; 1999; Sullivan, 2003; Pagiola et al, 1998; Rosenberg and Linders, 2004,) than to industrial monoculture agrarian practices. These include cyclical methods of fertilization using locally available organic materials, incorporating crop residues into newly prepared fields, growing a diversity of crops in polyculture systems, fallowing, keeping diverse types of livestock, and saving the seed of locally bred and adapted seed cultivars for replanting. The use of chemicals and High External Inputs (HEI) is minimal, although chemical pesticides powders are used for problematic areas. Given farmers penchant for saving and replanting the seeds of certain traditional crops it is possible locally adapted cultivars of these crops might have developed. This requires further investigation, particularly given that different communities use different cultivation and fertilisation techniques.

The affinity of traditional agriculture with agroecological practices raise questions about approaches that try to develop agriculture by imposing industrial monoculture practices that are foreign to local farmers knowledge systems, ignore deep socio-cultural connections to tradition, culture, custom, sense of place, communality and traditional knowledge, have no sympathy with local land use practices, and require high external inputs of knowledge and resources. A more appropriate approach to agricultural development calls for practices that build upon, and are sympathetic too, farmers existing knowledge, skills and cultural background. Such context related, participatory agroecological approaches have been successfully used amongst traditional people by organisations such as Dharamitra in India and the international organisation La Via Campesina (La Via Campesina Notebook No 2, 2010).

Table 2. Comparison of traditional amaMpondo agricultural practices, agroecological and industrial agricultural practices. (Compiled by Valerie Payn)

Agroecological Practices	**amaMpondo practices**	**Industrial agriculture**
Focus on self-sustainability. Holistic emphasis	Farming embedded in relationships to nature and culture	Reductionist. No recognition of culture in agriculture.
Integration of livestock, cropping systems and local ecologies.	Cattle and small livestock integral to agricultural practices. Local cultural adaptations to landscape.	Cropping and livestock systems separate.
Crop rotations, Inter-cropping, polycropping, use of legumes, fallowing, some natural areas left for conservation purposes.	Polycropping, crop rotations, fallowing, use of legumes (beans). Mosaic landscape.	Monoculture
Maintaining consistent ground cover.	Polycropping, leaving crop residues in field, leaving weed cover in fallow season help maintain consistent ground cover.	Ground cover not important
Sustaining high natural and agricultural diversity	High natural and agricultural diversity, mosaic landscape.	Uniformity. Low diversity
No till or low till. Reduced mechanisation.	Ploughing using draft animals or hoeing, but low levels of mechanisation	High mechanisation
Organic fertilisation through manures, composts, legumes, natural soil cycles	Use of manures, composts, legumes, natural soil cycles.	Chemical fertilisation and pest control
Low External Input –cyclical relationships and use of local products	Low External Input. Cyclical relationships. Local products used to enhance soil fertility	High External Input
Enhancing local knowledge	Passing on of local inter-generational knowledge	Use of external specialist knowledge
Seed collection and storage. Use of locally bred seed	Use of locally bred seed. Bought seedlings for certain crops	Industrially bred seed
Agriculture adapted to local environment	Local adaptations to suit local environment	Adapting the environment to agriculture.
(Sources. Mollison, 1990; Altieri, 1989; Lampkin; 1999; Sullivan, 2003; Pagiola et al, 1998; Rosenberg and Linders, 2004; Diver, 1999).	(Sources. Observations and narratives of amaMpondo farmers, and adapted from ATTRA Appendix III Table 1 in Systems and Technologies for Sustainable Agriculture; 2008:137)	(Sources. Adapted from ATTRA Appendix III Table 2 in Systems and Technologies for Sustainable Agriculture; 2008:137; Perfecto et al; 2008)

5.2/3 Unsustainable Practices

Of course, this does not mean that all local land use practices are sustainable. Communities have outlined numerous areas of concern over land degradation. Although communities express a wish to reverse obvious signs of ecological degradation, local capacity to address these problems is not clear. Communal conflicts over resource management and contradictions over areas of responsibility, such as Nonjojo women's acknowledgement of dependence on forest resources but placing the responsibility for forest management solely on government forest officers, suggests that in some communities local community relationships and sense of self responsibility might require attention before concerns about reversing ecological degradation could be fully realized.

In addition, it is not clear what financial resources, skills or capacity communities have at their disposal to deal with reversing ecological degradation, and this requires further investigation.

In addition, the long term impacts of human activity, less obvious ecological decline, and ecological decline in areas that do not directly or immediately affect local livelihoods, might not be fully appreciated. The mapping workshop provided a valuable exercise in highlighting some of the visible changes in ecologies that had occurred within living memory. These changes all had direct implications for community livelihoods and well-being.

However, the findings of the photographic time series assessment done by the Institute of Natural Resources (INR) (Quayle, 2011; see Appendix) suggest that while people may be aware of landscape changes within their immediate vicinity, they may not be completely aware of landscape changes that take place on a broad scale and over a long period. Nonjojo and Mthambalala farmers were correct that forest regeneration had taken place in old deserted fields in their vicinity, and attributed this to declining levels of agriculture, but they did not raise the issue that forest area's had also been felled to make way for new fields. Without further research one can only speculate whether farmers were unaware of the felling of forest for new fields if this did not take place within their immediate vicinity and did not directly involve them, or did not mention this, knowing that felling forest is illegal. The INR study (2011) emphasises the importance of collaboration between scientific and social studies in understanding landscape use (Quinlan and Scogings, 2004). While social study provides the social context in which landscape use takes place, scientific study can help identify aspects of knowledge which the limits of local perspective might ignore.

In the mapping workshop, one of the most notable changes shown in maps was the increase in the number of umzi, which corresponded to an increase in the number of fields, but a decline in the size of fields. This change was confirmed by further questioning. Although many communities commented on this change, I am not sure the extent to which they could foresee the long term consequences of this.

I think it is important to note that an increase in numbers of umzi does not necessarily directly correspond to population increase if people are living in smaller nuclear families rather than large extended families, and this aspect needs further research before definitive conclusions can be made.

Nonetheless, more umzi means communities become spread over larger land areas, with possible implications for the suitable allocation of commonage and cultivation sites.

The increase in the number of fields, corresponding to a decline in field size, has possible connotations for calculations of agricultural yields and food provision. If there are more fields and gardens, but smaller fields and gardens, does this mean total gross agricultural production has declined, or agricultural production per umzi has declined? Are smaller fields and gardens a consequence of reduced interest in agriculture, reduced capacity for agriculture, or reduced arable lands due to settlement spread? In some communities at least, such as Nonjojo, the number of old deserted fields suggest it is a case of the former, yet cultivation on less than ideal sites also indicates there may be other factors at play. Similarly, the INR (2011) findings lend support to the argument that relationships between land use, yield, shifting patterns of cultivation and local socio-cultural context require much more investigation. The INR (2011) findings make it clear that while in some instances the extent of fields has declined and forest has regenerated, in other areas the extent of fields seems to have remained constant over generations, while in other areas forest has been cleared to make way for new fields. Why, in different localities, have the extent of fields respectively declined, remained constant, and increased? These findings highlight that is it difficult to make generalised statements about the state of agriculture in Pondoland, and in different localities different local responses to agricultural production might have occurred in response to local socio-economic, cultural or ecological influences. Without comprehensive long term historical data it is difficult to know whether shifting cultivation patterns around forest areas are a fairly recent phenomenon, or whether these form part of a long standing historical pattern of land use amongst amaMpondo communities living in the vicinity of forested areas, or are recent responses to local socio-economic conditions.

The INR (2011) findings support the view that understanding the socio-cultural drivers of shifting patterns of agricultural land use are important to developing an understanding of how natural resources might be optimally managed, and in understanding how shifting patterns of land use might affect forest and grassland biodiversity.

Given the high local dependence on natural resources, high population increases could have numerous debilitating effects on the local way of life and local ecologies. The Sigidi community recognised this in their comment that they need extensive land and limits to the local population, to farm they way they do. Sigidi reliance on wetland gardens would provide a constraint to food production if population numbers exceed the availability of wetlands or suitable arable land. Currently, the wetland system of gardening seems sustainable, as there are many un-utilized wetlands, and in cultivated wetlands there are significant area's left uncultivated. Still, further research is required to determine how garden cultivation affects wetland ecologies. In Nonjojo, comments that too little flat land is available, meaning some people have to plant on steep slopes, could be an indication that increasing population pressures are leading people to cultivate on less than ideal sites. In some communities, including Nonjojo, comments suggest there has been an increase in forested areas. In Nonjojo, reforestation is directly attributed to a decline in agricultural production, with old fields being revegetated by forest.

In addition, population increase could contribute towards a loss of community cohesion, making the consensus required to manage communal resources more difficult. Particularly if there are overlaps between boundaries or a lack of clear boundaries demarcating communal resource use. Currently, rivers form important boundaries between communities, but further research in needed to establish how different communities are managing resources, and whether there are areas of overlap or ambiguity between communal boundaries. Given the importance of community cohesion in communal resource management, concerns that too many churches could split communities are well-founded, as the splitting of communities could have detrimental impacts for resource management.
If widespread commercialization is undertaken without clear knowledge of the potential impacts on local culture and ecologies, and means devised to overcome potentially negative impacts, this could also affect impact the sustainability of land use practices.

5.2/4 Relationships between Land Use and World-View
The system of land acquisition through the granting of usufruct is valued as a means by which even the poorest families can have access to land and the means to grow food. In the sense of sustainability, this method of land allocation fosters both the ability to achieve household food sovereignty and household food security by theoretically enabling all in a community to have access to a wide range of resources and different land types. The importance of commonage for communal well-being is expressed in phrases such as , "...they all have a common interest because they all depend on the land" (Box 11), "If the forest disappeared, we would die" (116) and "We need all this land to farm the way we do" (Box 8).

On one level these expressions of dependence on the land might be taken as purely practical expressions of socio-economic interest where commonage allows broad access to important resources, so helping the poor to avoid total destitution and obtain some security of land tenure and food self-provision. From this perspective, privatization of resources would deny access to those who need it the most, those without money to acquire important resources for survival.

However one must also question whether, on a deeper level, the extensive employment of commonage as a land use strategy is a manifestation of the philosophical influences of Ubuntu? Does Ubuntu's emphasis on the inter-dependence of all humans with a broader social and natural environment and with actions that emphasise communality, lend itself to a society where land is viewed primarily as a common resource to be used for the benefit of all? Although more research is needed to draw definitive conclusions I would suggest that collectively, comments such as "Land is to be used as you need it" (Box 11), the deference paid to Ancestors and sacred sites, beliefs around the powers of mythical creatures and the magical powers of various plants, and the emphasise on the necessity of connection between communities expressed in phrases such as "It needs communities on both sides of a river to be involved if a river is to be maintained properly" (Box 23) are manifestations of the influence of Ubuntu, with its stress on inter-connectivity. Furthermore, that the influence of Ubuntu is also realized in customary patterns of land use and distribution that stress common access to important resources through extensive use of commonage (refer also 5.2/4).

That is, that traditional allocations and spatial distribution of land express a deeper world view that reflects Ubuntu and Ukama's philosophical emphasise on communality and inter-dependence, and a belief that what nature provides for free (including access to land) is considered a common resource for the sharing and benefit of all people in a community, rather than for commoditization and the profiteering of a few. This perspective is evocatively expressed in the following explaination;

"It is not our traditional custom to sell things that we are given for free from the Earth. You take what you need and if you have more than you need you give this to others who need. In our community what belongs to one person is also considered to belong to everybody in the community. If you have something that others do not, it is considered very important to share" (Nokwanda and Mzamo, bio-cultural mapping workshop, May 2011).

This sense of communality is evidenced by Mr. Solubala granting some of his land to his neighbour and giving her farming advice, the emphasise placed on sharing as a socially respected and expected way of showing one belongs to a community, the comment that looking after oneself also entails looking after one's neighbour, and the traditional emphasise on suitable respect being paid to a large variety of places and things, including burial places, Ancestral spirits, the ocean, sacred river pools, and the spirits and mythical creatures that inhabit these and other special places.

If Ubuntu's stress on communality and on actions that are undertaken for the greater benefit of the community is the underlying rationale for local systems of land use, this presents a stark contrast to

normative western ways of thinking about land, where land is primarily viewed as a commodity for private ownership, to be utilized for the economic gain and benefit of individual owners.

One must then ask what it means for social cohesion, for Ubuntu, for customary patterns of land use, for democratic processes, and for development when traditional values that stress communality are eroded by the increasing influences of westernisation and concurrent changing value systems as is evident by the contrasts in the value systems of the elderly and the youth (refer 5.2/8)? While this thesis does not allow scope for a deeper examination of these questions, they are nonetheless important issues for further examination of the role of change and land use practices amongst traditional societies such as the amaMpondo.

What is clear from this research is that applying purely market based economic criteria to land use amongst these traditional communities misses the important connections between local systems of land use and the socio-cultural elements that define the traditional amaMpondo way of life and sense of place, with its deep spiritual, historical, cultural and familial links to landscape.

Market and yield based criteria of value applied in agricultural reform programmes have failed to take into account these wider values that define amaMpondo culture. These include the cultural role that traditional crops play, such as in making special dishes and traditional beer that are used in cultural rites, the role of livestock in cultural rites, and the particular affinity that communities have to the landscape they live in. This affinity extends beyond economic concerns, and embraces cultural, spiritual, historical, familial and local knowledge systems. In the mapping workshop, prominence was given to spiritual and ritualistic sites related to local belief systems, as well as to umzi, schools, churches, roads, spaza shops, clinics, fields, gardens and grazing lands, natural places of value such as rivers and forests, and significant historical sites such as burial grounds. Understanding local agrarian production systems also entails understanding these deeper socio-cultural connections to landscape and a particular way of life.

It is interesting that in the future scenarios drawn by the mapping participants, improved basic infrastructure, schools, health facilities, and the development of small tourist facilities such as camping sites, as well as reversals of obvious signs of environmental degradation, formed the bulk of 'future wants'. There was no mention of the sort of 'developments' that government proposals suggest, such as industrial agriculture, mining, and Pondoland Parks. This suggests a critical disconnection between government planning and policy agendas and the aspirations of traditional amaMpondo farmers, lending support to Marx's Theory of Metabolic Rift where urban capitalist agenda's are given political precedence over rural needs (McClaughlin and Clow. 2004. Refer page 51). It also supports Bulkeley's views (2005) that levels of scale in governance affect the interpretation of problems.

5.2/5 Local Adaptation to Local Conditions

Although broad traits of land allocation and land use are similar across all communities, within the broad parameters of these traditional spatial arrangements, localized adaptations to local conditions mean the specific ways these become realized in different localities is highly variable. In Sigidi, Nonjojo and Mthambalala different physical landscape characteristics have given rise to different spatial adaptations to the landscape.

In Sigidi's predominantly flat landscape with poor and shallow soils, those area's most suitable for cultivation have been selected for fields and gardens, even though these area's are in many instances far from umzi. In Nonjojo, with its reportedly rich soils, umzi, fields and gardens are in close proximity to each other. In Mthambalala, fields are clustered in flat alluvial areas near the river, although these are also some distance from umzi. In addition, the hilly nature of the landscape around Nonjojo and Mthambalala, combined with population increase, means that some umzi cultivate on very steep slopes. Spatial distribution is also affected by individual preferences, such as Mr Gampe's decision to place his garden close to his house for safety reasons, as the nearest wetland was too far away to keep in contact with those working in the field, and the acknowledgement that young people like to place their umzi where they can get cell-phone signal. In some instances proximity to roads also affects the spatial placement of human settlements. Although some of the mapping communities state that new roads should not disturb field and garden sites but go around these, in Empindweni both umzi and fields had been moved to be closer to new roads, while land previously occupied by these had been re-allocated as grazing commonage. Spatial reconfiguration might also be an influencing factor in the changing patterns of land use indicated by the NRI time series assessment.

In Sigidi, the wetland gardens seem to be a local adaptation to a problem of soils with poor nutrient and water holding capacity, enabling people to grow a range of crops under rain-fed conditions which might otherwise be impossible. In addition, if the local lore about dune degradation being a consequence of planting on wind-swept dunes is correct, then planting in the wind sheltered valleys between the dunes, which also happen to be wetland areas, seems to be a wise and logical local adaptation. I have noticed that wetland gardening is unique to all the farmer-gardener communities living in close proximity to the dune belt, and that the practice of wetland gardening extends as far south as Sikombe, where the dune formations end. I have not come across wetland gardens in other coastal or inland parts of Pondoland I have visited. This suggests that the cultivation of wetlands for gardens is a unique local adaptation to coping with food provision and extending food self-sufficiency in an area where conditions are not ideally suited to agricultural production.

Geological factors may also play a role in affecting agricultural practice. In Sigidi, fields and gardens are extensively fertilized with manure. Garden cultivation involves ploughing as well as labour

intensive digging of pits and furrows in which to place manure prior to planting, while wetlands are a favoured site for gardens because the soil is reportedly better there. In Nonjojo and Mthambalala, ground preparation is much less intensive, with seeds commonly being cast on the ground before ploughing and simply ploughed in as sods are turned. In addition, in Sigidi fallowing of both wetland gardens and fields is a regular practice, while farmers in Nonjojo and Mthambalala do not practice fallowing. I have not undertaken research that determines whether these differences are cultural, or a consequence of varying geological conditions. However, given the generally poor quality of soils in the Msikaba formation and farmers reported 'richness' of soils around Nonjojo and Mthambalala, and clear evidence of extensive earthworm activity in the forests around Nonjojo and Mthambalala, suggests that differing ecological conditions may play a significant role in variations in local practice. In light of extensive vermicasts in forests around Nonjojo and Mthambalala, the extent to which natural biological soil processes in the area contribute towards soil fertility requires further research.

While cultivation of a variety of fruit trees is widespread in Nonjojo and Mthambalala gardens, bananas are the only fruits cultivated in Sigidi. This may also be a consequence of geological variations which make the Sigidi area unsuitable for tree cultivation. These spatial variations suggest that traditional land allocation patterns allow for flexible land use options that are adaptable to various individual and ecological conditions, while enabling optimal access to all people in the community to necessary resources for livelihoods provision.

5/2/6 Cattle Integration with Cropping Systems

In Sigidi, there is extensive dependence on cattle manure for field and garden fertilization. The high dependence on manure for crop fertilization suggests a symbiotic relationship between cattle stocking rates, the cropping system and the availability of grazing lands. Field and garden fertilization requires enough cattle to provide sufficient manure, and this in turn requires adequate grazing land. This inter-dependence means that changes to the ratio of fields and gardens, cattle, and grazing would have possible implications for food provision. This symbiotic relationship needs much further study, but might be the basis upon which Sigidi farmers exclaim that they need extensive land to farm as they do, which would be jeopardized by too many people. In Sigidi, good inter-gender relationships have been maintained and whole families are involved in agricultural activities. Men, women and children participate in field and garden cultivation, and men are conscientious of their traditional pastoral role as cattle herders. This suggests a reciprocal relationship between men's traditional duties as pastoralists and women's roles as agriculturalists. With all people in the community being dependent on crop cultivation for food, and crop cultivation being highly dependent in cattle manure, the pastoral role becomes essential for food provision. In contrast, Nonjojo women complained that a breakdown in cattle herding traditions had adversely affected crop cultivation. In this area too, farmers did not use

cattle manure for fertilization in the extensive manner of Sigidi. I was not able to determine whether there was a relationship between the breakdown of cattle herding responsibilities, and not using manure for fertilisation. What is clear is that both inter-gender and intergenerational relationships seem far more solid in Sigidi than in Nonjojo, and these have implications for agricultural activities. The breakdown of traditional herding roles in Nonjojo has meant Nonjojo crop cultivators now feel a need for fences to prevent cattle devouring their crops. This suggests inter-relationships within the traditional system between gender roles and the integration of cropping and livestock systems. The situation in Nonjojo suggests a breakdown in the traditional role of men as pastoralists has adverse implications for agricultural production.

5.2/7 Community Relationships

The role of community relationships in agricultural production and land care is highlighted in the differences between Sigidi and Nonjojo. In Sigidi, the community takes care to ensure good community relationship prevail by being particular about who settles in the community, arrangements that also include guidelines about marriage. Sigidi farmers also emphasise passing on traditions of land care, food sufficiency and agriculture onto their children by involving the children in farming activities, and obviously place high regard on farming activities as a means of food provision. In contrast, in Nonjojo the elderly voiced concern that the youth were not interested in abiding by tradition, and did not listen to the elders. This turn of events is blamed on school education, government laws that prevent parents chastising their offspring, and child care grants that make young girls 'in the business of making babies' financially independent of their parents. The implications of social grants for agricultural production has generated public debate (Mashala, 2011), with researchers refuting public perceptions that social grants undermine subsistence agricultural production by creating a culture of dependency on social welfare (Neves et al, 2009). However, my thesis research suggests that within certain localized contexts, social grants may be a factor in undermining cultural traditions that have underpinned traditional agricultural production by reducing the necessity for self-sufficiency and by influencing cultural traditions. In a society in which women have traditionally played a central role in agriculture and food provision, the loss of interest in young women in continuing to play the traditional role of agriculturalists and food provisioners, for whatever reasons, has significant implications for the agricultural production of umzi. This loss is lamented by young men complaining they can no longer find suitable wives to help them farm, as well as elders laments that the youth are more interested in buying stuff and in entertainment than in being food self-sufficient. My research also suggests that the impacts of social grants within particular communities may be inter-connected to other factors at play within local contexts, such as local value systems and the state of inter-gender and inter-generational relationships (See 5.2/8).

5.2/8 Communal Attitudes

Despite the universal acknowledgement of reduced food self-sufficiency and declines in agricultural production, there are important differences in the narratives about food self-sufficiency that Sigidi farmers tell, compared to Nonjojo farmers. There are also significant differences in the attitudes of the elderly and the youth. While farmers in both these communities mention the lack of suitable markets as a constraint on increasing agricultural production, Sigidi farmers see their ability to grow food as a positive factor that means they never go hungry and can use social grants for self-improvement, such as investing in their children's further education. Children are actively encouraged to play a role in agricultural production. In Sigidi, agricultural production is seen as a family affair.

This social cohesion seems to be lacking in Nonjojo. Amongst the younger generation in Nonjojo, social grants seem to be viewed as a means to purchase beer and to buy food, rather than growing one's own. The elderly' pride in their traditional food self-sufficiency, contrasted with youths perceptions that growing your own food is a last resort if employment opportunities are not available, indicates changing intergenerational value systems. These differing perspectives highlight the important role of value systems and attitudes in local agricultural production. Given that social traditions and agrarian traditions, such as ilima, are often inter-connected with agricultural production, the loss of traditional value systems goes hand in hand with loss of cultural tradition, loss of agrarian knowledge, reduced self-sufficiency and increasing dependence on external means of support such as social grants and jobs. The decline of practices such 'ilima' not only undermine agricultural productivity as a consequence of less labour, but also potentially undermine social cohesion as communities no longer participate in the rituals of 'ilima' festivities which brought communities together in common purpose.

The youths' complaints suggest that market and government failure to provide suitable market support and pricing structures for small scale farmers has meant youth have developed a negative view of agriculture's viability. This is in line with evidence that the modern global food system has failed to meet the needs and aspirations of small scale farmers.

Chapter 6: CONCLUSION

The Literary Review highlighted that a consequence of a narrow, reductionist focus on development as economic industrial development has been the failure to understand the complex nature of inter-relationships between culture, land use and agricultural production. Consequently, impositions of culturally and ecologically unsuitable developments have perpetuated widespread and inter-connected loss of cultural, agricultural and biological diversity (Norberg Hodge et al, 2000; Naveh, 1995; Antrop, 2005; Patel, 2007; Altieri, 1998). This study supports these views. A historical review of development in Pondoland shows how externally imposed developments that failed to take into account these inter-connections contributed towards internal changes to amaMpondo society, where a combination of externally imposed change and internal change led to a decline in socio-cultural traditions that upheld local agrarian production.

Nonetheless, despite the influence of historical events, the narrative approach used in this thesis shows that amongst traditional farmers in Pondoland's Wild Coast region there remains a strong reservoir of agrarian socio-cultural tradition that is rooted in amaMpondo culture. Broad similarities between different amaMpondo communities indicate that agrarian practices in Pondoland form part of a socio-cultural complex. Within this amaMpondo socio-cultural complex there are strong inter-relationships between agrarian practice, local knowledge systems, world -views, localized skills, spiritual beliefs, gender roles, local history, tradition, customary rites, and natural resource use. These inter-relationships mean that landscape use and agrarian production is traditionally related to people's sense of self-identity as amaMpondo. Yet within living memory, continuing internal changes to cultural identity, such as changing value systems and a decline in traditional customs related to agricultural practice such as ilima, continue to affect agricultural production and land use. The causes of these changes are complex. They include changing food tastes, changing value systems, increase dependency on social grants, decreased pride in self-sufficiency, increasing materialism, changes in traditional gender roles, and changes to the spatial and structural composition of the landscape such as roads and spaza shops bringing increased access to commercial products, and population changes and technological innovations such as cellphone connectivity and road access potentially affecting traditional settlement patterns. These changes cannot be divorced from socio-cultural influences within the broader South African and global environment, such as the influence of education, westernisation, the influence of media and advertising, market structures, government policies, roles of responsibility, and the increasing influences of existing in a monetary economy.

The inter-relationships between cultural heritage, land use patterns, natural resource use and agrarian practice means that the Pondoland coastal landscape is not 'unutilized' land or 'wilderness' but forms part of an complex agrarian cultural heritage that encompasses numerous different forms of land use. These inter-connections suggest many elements within traditional amaMpondo way of life that are in keeping with the concept of a 'Living Landscape'. Namely, these Pondoland communities live within a landscape that has been shaped by a particular agrarian based culture, yet that culture has also meant the landscape has retained many of its natural characteristics.

If historical precedence is anything to judge by, development and conservation proposals that ignore these complex relationships risk imposing culturally unsuitable 'solutions' that are likely to generate local resistance. A historical tendency to ignore these inter-relationships and try and develop agriculture using methods that are foreign to the local culture, suggests a tendency to 'frame' Pondoland's problems in western industrial terms. This tendency might be explained by an inability to recognise that the   amaMpondo arrangement of the agrarian landscape, with its flexible allocation of allotments and commonages, is not readily recognised by a western industrial order that has a very different perspective on agrarian land use and 'order'.

Although broadly similar traits amongst different communities give defining characteristics to amaMpondo culture, within those parameters there is broad adaptation. These are influenced by the particular socio-cultural conditions and circumstances in the community, individual preferences and skills, as well as existing ecological conditions. These differences make it difficult to make generalized assumptions and suggest that understanding local land use and agricultural practices requires a contextual understanding of the socio-cultural and ecological background of particular communities.

The traditional gender allocation of agrarian tasks, with men as pastoralists and women as agriculturalists, seemed structured to complement each other. Where social changes have broken down these interdependencies, agricultural production has been adversely affected. In these cases, it seems intergender relationships need rebuilding. The important traditional role played by women in household agricultural production and food provision and men's supporting role as pastoralists needs recognition and affirmation. Although Western based feminist perspectives might question how a cultural system that promotes strictly defined gender roles can promote egalitarianism, one must question the validity of 'reading' other cultures from the perspective of Western based value systems. In addition, the complaints of Nonjojo women farmers, i.e. that local breakdown in pastoral traditions has undermined their agricultural ability to produce, lends supports to the idea that traditional gender roles, far from promoting inequality, help to perpetuate an important role for women as the custodians

of local food sovereignty, traditional agrarian knowledge and an umzi's self-sufficiency. The industrial agricultural system, with its emphasis on external knowledge and the commodification of agricultural goods, undermines this role to the detriment of women and household food security.

This raises the important point that it is not the traditional allocation of gender roles that needs examination, but the value that different cultures assign to women's traditional roles. In other words, are women's traditional roles held in high esteem by the culture, or denigrated? Amongst the amaMpondo, the traditional payment of 'lobola' for a wife is closely connected to the esteem placed on a woman through her status in society and her ability to perform her traditional role (Crampton, 2004). While there is no scope in this thesis to dwell at length on the implications of 'lobola', the fact that men have to pay a hefty 'bride price' to acquire a wife suggests that in traditional amaMpondo society women's roles where highly valued.

The perception that traditional systems of agriculture are 'backward' and need 'modernising' needs to be overcome. Traditional systems need to be recognised as the consequence of a complex world view and way of life that are related to people's sense of place within a landscape, within a community and within the skills, knowledge, beliefs and resources that communities have at their disposal. In this sense, traditional agriculture should be seen as a complex adaptation to a particular set of circumstances, underpinned by a particular world view. In addition, farmers' narratives suggest that in the studied communities local agrarian systems play an extremely important role in providing food-sufficiency and maintaining food-sovereignty. In many instances, comments about the loss of 'hlonipha' (paying of respect) to particular special places within the landscape suggest that in some cases at least, ecological degradation also appears to be a consequence of the breakdown of socio-cultural traditions that underpinned land care systems. This aspect has not been extensively covered in this thesis and requires further research.

The role played by social grants, particularly child care grants, needs further investigation that is rooted in an understanding of localized socio-cultural context. While in some instances social grants seem to be put to constructive use, in other instances local narratives suggest these may be inter-connected to local socio-cultural breakdown and declines in local agrarian production.

Many aspects of traditional culture and landscape use fall in line with important criteria for sustainability through creating a sustainable agriculture and a 'Living Landscape'. These include social systems and land use patterns that facilitate high agrarian and biological diversity, low chemical use, re-cycling of nutrients such as manure and crop residues in to the soil, equitable access to resource use for even the poorest, a sense of responsibility and communality, respect for other including community and environment, pride in self-sufficiency, adaptability to local environments, and local knowledge and skills. In addition, the preference for using locally bred and saved seed for

replanting traditional crops suggests that local plant cultivars might have developed that are suited for local conditions. This requires further investigation.

Traditional amaMpondo world views have much in common with 'Deep Ecology' perspectives, embracing a holistic, relational world view that recognises the inter-dependence between humans and between humans and the natural world that reflects a sense of egalitarianism and communality, and recognises the importance of respect for the total human environment. These are important elements in the culture that should be encouraged, as they present an antithesis to current global development paradigms where both land and food are highly commoditised, millions go hungry and homeless in the midst of plenty, selfishness and greed are revered under the banner of competition, individuality, self-interest and the god of consumption, and nature is viewed merely as a commodity to be bought and sold. Yet these worthwhile traditions seem in increasing danger of being compromised by continuing socio-cultural change and loss of cultural tradition and identity. This is particularly noticeable in the youth changing value systems, including increasing materialism. This is not to suggest that the culture should remain as a static museum piece, but rather recognition and encouragement for what is valuable within the culture for achieving sustainability.

The complex relationships amongst numerous elements related to agricultural production in Pondoland suggest that reviving Pondoland's agriculture involves arresting the socio-cultural decline of traditions that under-pinned agrarian production, as well as ecological decline that hampers livelihoods provision. These findings support the arguments of Bryceson (2002). Namely, that agrarian decline does not represent the failure of peasant agricultural systems to adapt to neo-liberal development paradigms, but rather the undermining of traditional peasant society by current industrial paradigms of development. Farmer's comments suggest that many would welcome increased commercial opportunities, and that government could help facilitate this by providing suitable market opportunities, pricing structures and infrastructure. Given the important role played by women in agricultural production, these opportunities should include women.

The nature of some of the key complex inter-relationships influencing amaMpondo culture, agrarian production and land use are technically illustrated in the following diagrams, using qualitative causal loops diagrams created on VENSIM.

Box 28. Causal loop diagrams illustrating key inter-connections between Agricultural Production, Culture, Ecology and Landscape use within the study area.

Diagram A. Overview of key influencing inter-connections and potential feedback loops in amaMpondo agriculture.

VENSIM analysis indicates 22 feedback loops within this analytical framework, suggesting high levels of inter-connectivity between agrarian production, local culture and local ecologies.
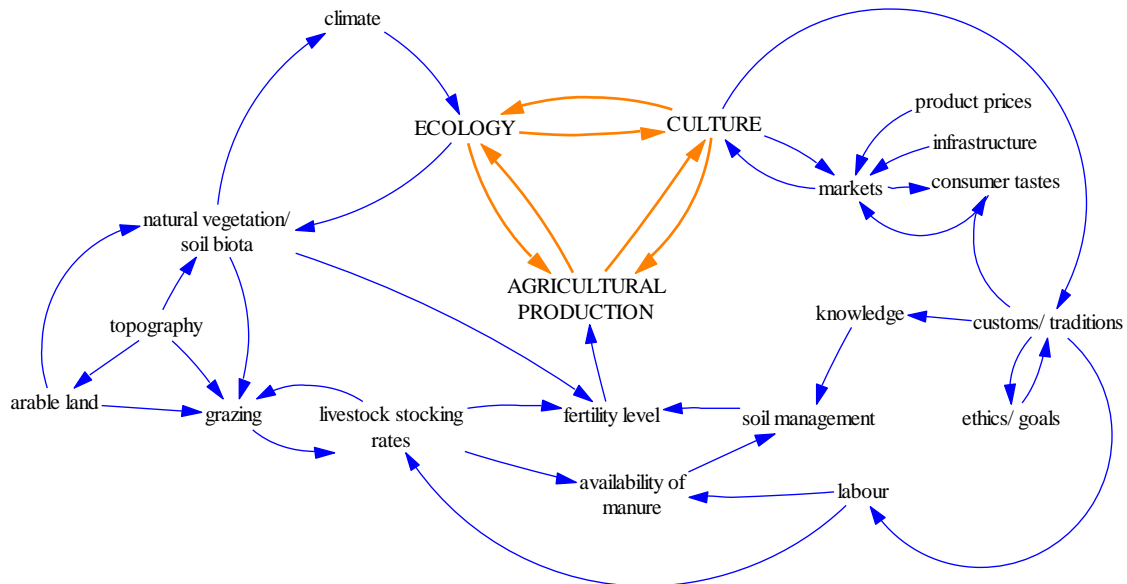
Diagram B. Inter-connections between, culture, customs, and agricultural production

Pink lines trace influencing interrelationships between Culture, livestock stocking rates and agricultural production. Through its influence on tradition and custom, culture has an impact on the availability of labour through practices such as ilima and herding. These in turn influence grazing patterns and livestock stocking rates. Livestock stocking rates influence the availability of grazing in a feedback loop. Both of these affect the availability of manure which, together with labour and local knowledge, would potentially impact on soil fertility levels, with consequences for agricultural production. The inter-connections between agricultural production, ecology and culture mean that changes in agricultural production would also potentially have cultural and ecological implications.
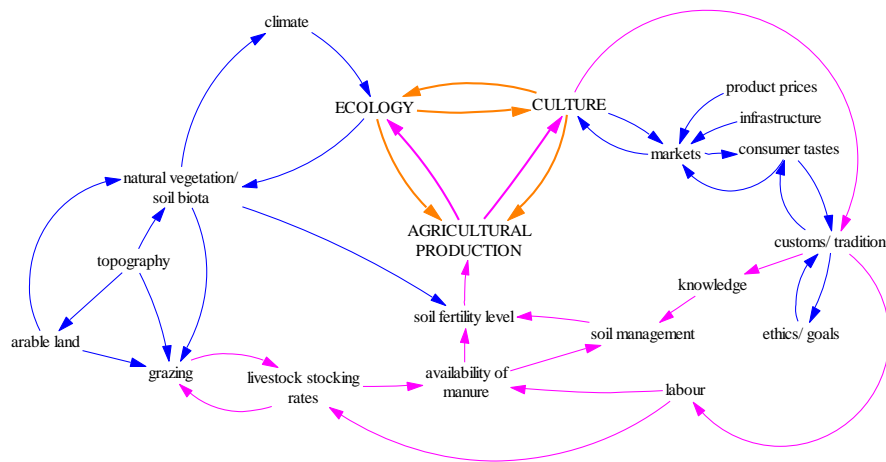
Diagram C. Interconnections between Ecological systems and Agricultural production, and between markets, customs and traditions, and consumer taste.

Green Lines highlight feedback loops between Ecology and Agricultural Production.

Brown Lines highlights feedback loops between Markets, Culture and Agrarian Traditions and Customs.
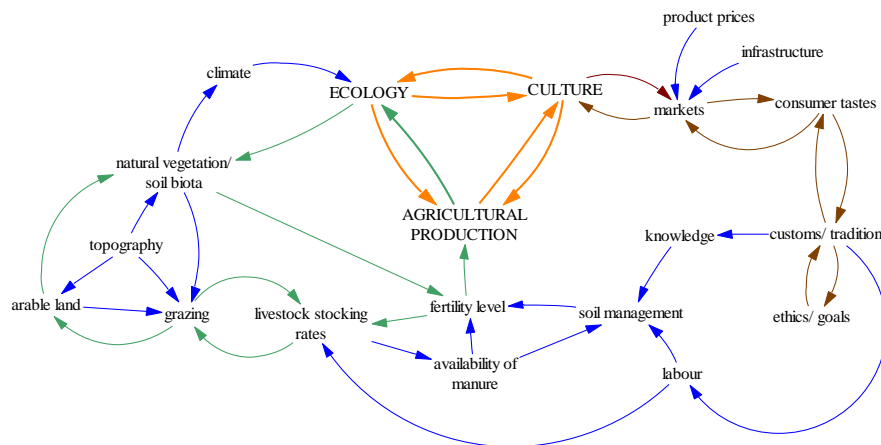
The following diagrams provide further qualitative analysis of various influencing relationships between elements that comprise the Pondoland Agrarian Landscape, using VENSIM systems modelling programme.

Figure 49. Elements influencing Agricultural Production
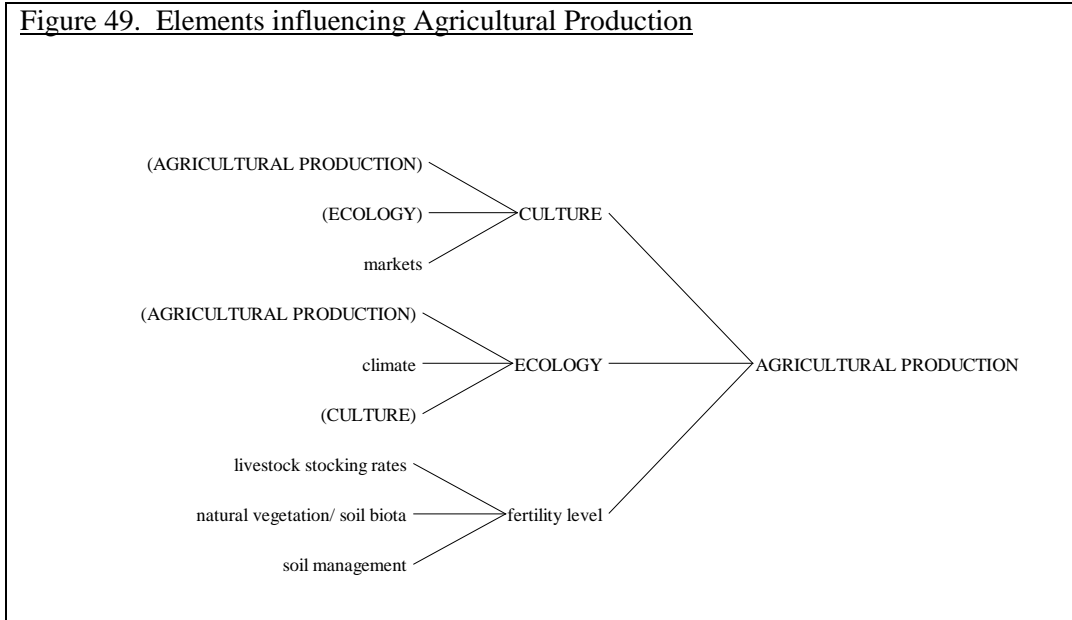
Figure 50. Elements influenced by Agricultural Production
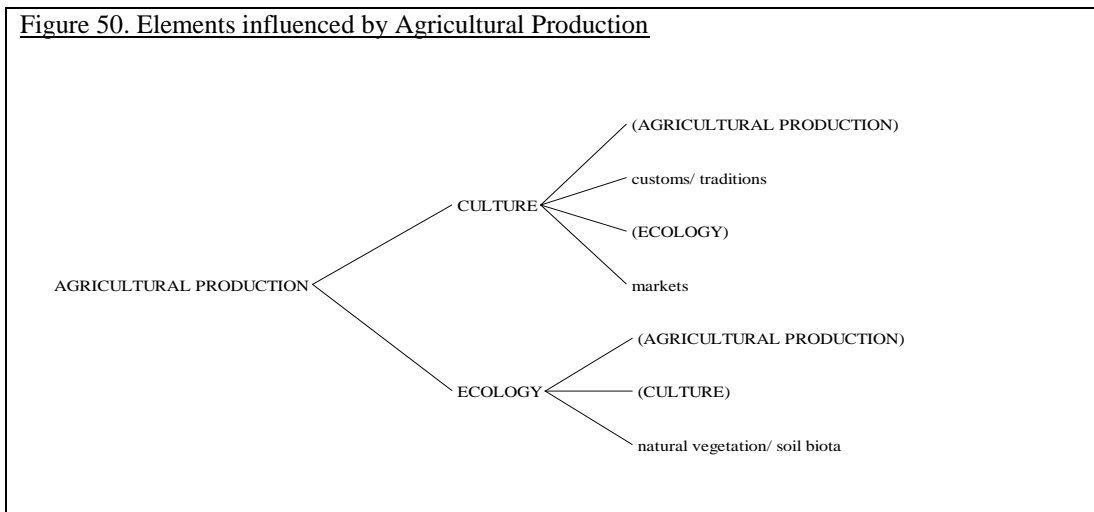
Figure 51. Elements influenced by customs and traditions

consumer tastes————————————markets

ethics/ goals————————————(customs/ traditions)

customs/ traditions◄   knowledge————————————soil management

availability of manure

labour

livestock stocking rates
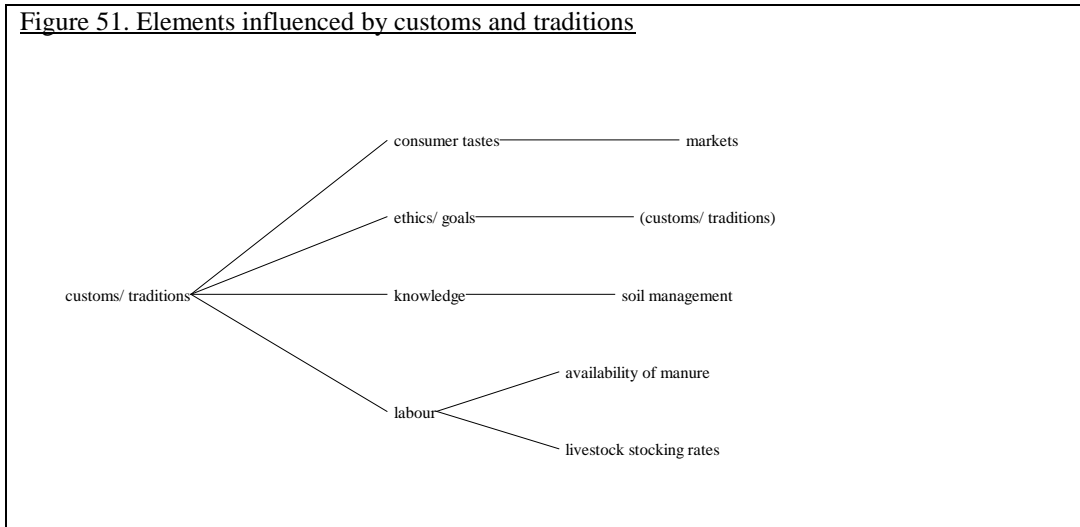
Figure 52. Elements influencing grazing regimes

(topography) ————————————arable land

(grazing)

labour   livestock stocking rates

(arable land)   grazing

ECOLOGY————————————natural vegetation/ soil biota

(topography)

topography

Figure 53. Elements influencing Culture
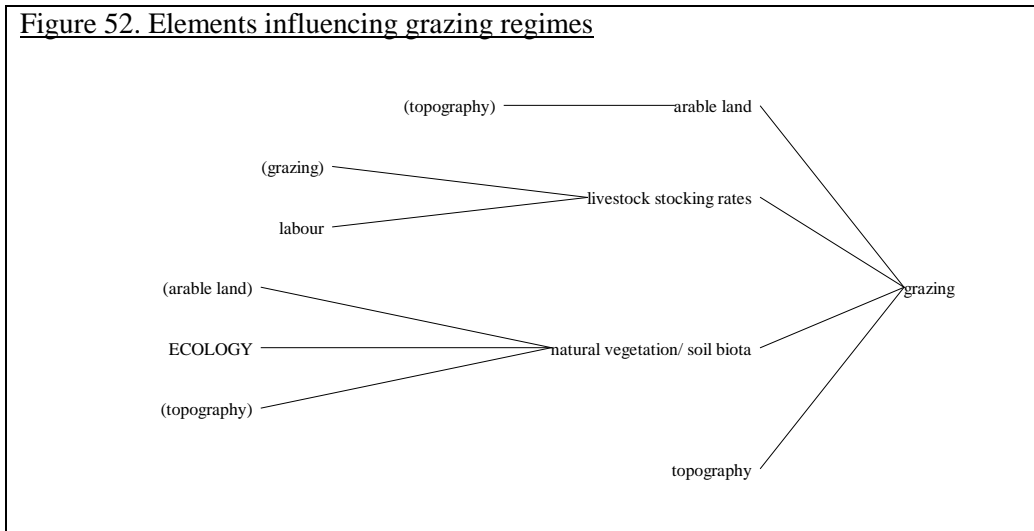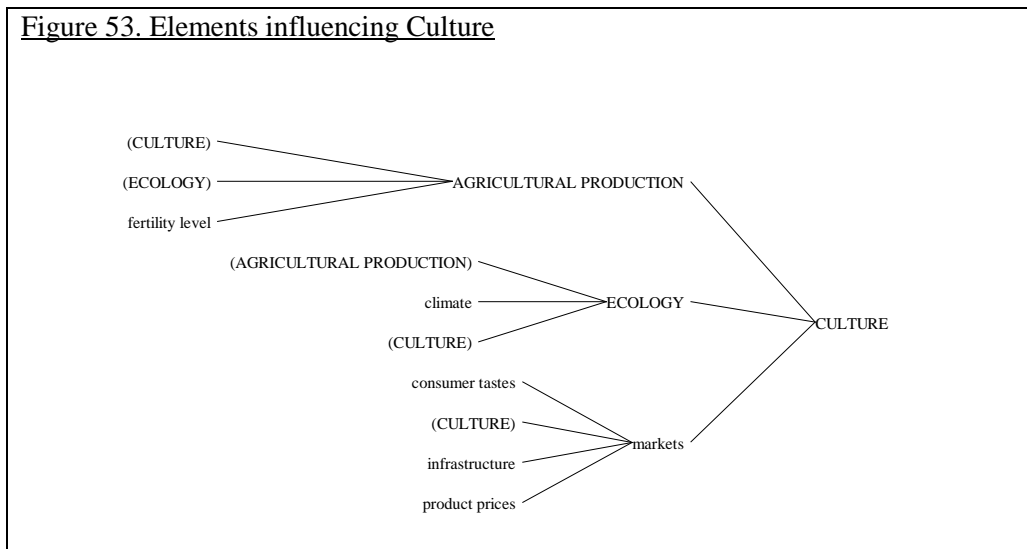
These complex inter-connections suggest that investing in sustainable agriculture in Pondoland requires far more than focusing on the yield of a narrow range of crops. It requires recognizing the relationships between people's identity, sense of place within the landscape and community, social investment to build up community capacity, and the realization that agrarian practice, land care, and social custom are inter-connected. Capacity building should include restoring intergenerational and intergender relationships where these are declining, building upon existing knowledge bases using agroecological techniques with an affinity to local practices in order to improve local soil fertility and production capacity, respecting local tradition and belief systems and encouraging those traditions based on respect for other and the environment, regenerating degraded environments, providing suitable opportunities for youth to gain a sense pride in agricultural achievement within a cultural paradigm that they are familiar with, and providing suitable market opportunities. This task requires context related, participatory approaches, rather than 'one size fits all' authoritarian approaches.

In Section 1.1 I pointed out that an important consideration for the creation of a sustainable agriculture is how land conversion occurs, not just whether land is converted to agricultural use. If agricultural sustainability requires arresting the decline of biological, agrarian and cultural diversity in a manner that promotes food security and food sovereignty, then this requires sensitivity to the way that amaMpondo farmers interact with the surrounding landscape, and the promotion of those local agrarian land use practices that enable diversity, in all its forms, to flourish. This study has shown that currently many characteristics of amaMpondo agriculture have an affinity to recognised agroecological and sustainable land use practices (Refer Table 2). In Pondoland, traditional land use practices foster a mosaic landscape use that allows for the continued existence of many different natural habitat types and the cultivation of numerous crop varieties, with many traditional crops being

cultivated from locally bred and adapted seed. To ensure a 'Living Landscape' those cultural attributes that foster this ecological and agrarian diversity within Pondoland need to be nurtured.

This study has only touched briefly on some of the many aspects that a complex agro-ecological understanding of Pondoland's agriculture requires. Many of these relationships require much further investigation, which I have highlighted. I am sure there are others I have not recognized. Nonetheless, I believe this study has shown that the nature of the complex relationships between amaMpondo culture, local agrarian systems and land use have contributed to an agrarian landscape with unique vernacular characteristics, and that these characteristics have enabled important elements of biological diversity that comprise the Pondoland Centre of Plant Endemism (PCE) to be maintained, as well as contributing immensely to local food security. In this sense, the importance of amaMpondo traditional systems of agriculture as providing alternative systems of land use and food security to that of industrial agriculture, need to be recognised.

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Other references useful for sourcing information about government development policies and current debates relevant to development along the Pondoland Wild Coast.

www.dti.gov.za

www.ecdc.co.za

www.swc.org.za

Appendix

Explanation for reading causal loop diagrams

In a causal loop diagram, the arrows indicate the flow of influencing relationships between various elements. For instance, in the below illustration, the arrow indicates that events in the cultural sphere have the capacity to affect the ecological sphere.
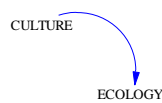
If changing events in the ecological sphere also has a capacity to influence events in the cultural sphere, this is represented thus:-
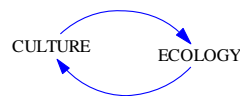
This diagram shows that, because of inter-connections between culture and ecology, changes to culture can set in motion changes to ecology, but changes to ecology can also potentially set in motion changes to culture. This two way inter-dependent relationship, where changes in one sphere can set in place changes in another sphere which in turn may 'feed back' to instigate changes to the original sphere, setting in place a cycle, is known as a 'feedback loop'.

Within systems, feedback loops can occur in a non-linear manner. The below representation illustrates the nature of a non-linear feedback loop. The inter-connected relationship between ecology, culture and agriculture means that changes to ecology could instigate changes to culture, that could set in place changes to agriculture, which in turn could cause new changes to ecology, so setting motion a cycle of events. Where such changes are of a desirable nature, such cycles are termed positive cycles. Where the consequences of such cycles are undesirable, these are termed vicious cycles.

180
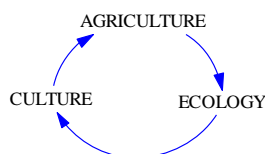
The two way relationship between various elements, and the number of possible feedback loops, can be represented by a diagram that shows the inter-connection between various elements. This following diagram shows feedback cycles between culture and ecology, ecology and agriculture, and agriculture and culture and vice versa.
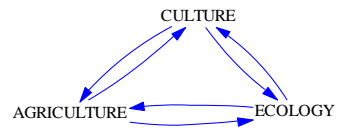
Time series analysis of land cover changes around the communities of Mthambalala and Nonjojo, in the vicinity of Ntafufu and Manteku Rivers.

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Institute of
Natural Resources

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Introduction
Background and Aim of the study
There is a widespread public perception that the level of agricultural activity in the study area has declined in recent times. Local elders say there is more forest area as a consequence of a decline in agricultural productivity, as old deserted agricultural lands are encroached by forest. A review of historical aerial photography has thus been called for to assess the validity of these claims. The Institute of Natural Resources has undertaken such an analysis and the results of this are the subject of this report.

The aim of this study is to assess the changes in land cover/use around the communities of Mthambalala and Nonjojo, in the vicinity of Ntafufu and Manteku Rivers (the study area) over the preceding eighty years, using a chronological series of aerial photographs (1935, 1956, 2008). Change in land cover is to be assessed with respect to three categories:

- Grassland / Cultivated area (these are combined due to the difficulty in identifying cultivated areas in the historical images)
- Shrubland / Secondary forest growth
- Forest

Method
Historical aerial photography of the area was sourced from the Surveyor General in Mowbray, along with current black and white 1:10 000 orthophotos. The orthophotos were used as a base map from which to source reference points for the ortho-rectification of the historical imagery (scanned photos). This proved to be difficult as very few fixed control points could be located in both the orthophotos and the historical imagery due largely to the time that has elapsed and also due to the course resolution of the historical photography. The rectification of the images was thus thought to contain a limited level of error and this has influenced the method adopted in comparing land cover patterns over time.

Initially it was proposed that areas of the three categories would be mapped, calculated and compared, however the lack of fixed control points that could be located accurately in the historical imagery as well as the orthophotos meant that this would be inaccurate and possibly misleading. A visual comparative assessment has thus been undertaken based on softer, less accurate control points.

Land cover patterns of forest patches, shrubland and areas where agriculture (grazing or cultivation) could be undertaken were digitized from the 2008 orthophotos to provide a vector map of the three categories in their current configuration. This vector data was then overlain on top of the historical images in order to define areas for comparison between the current situation and historical configurations in the same area. The 2008 configuration is presented in figure 1 together with the location of the selected sites for comparison.

In the tables which follow, each of the selected sites is presented with photography from 1937, 1956 and 2008. In all three cases, the 2008 configuration is superimposed on top of the image, providing the reader with an indication of the level of change between the photo and the current situation.

Areas of significant change have been pointed out at each site however the reader should be aware of the many smaller areas of change that can be noted in the comparative images. In particular, the reader should tune in to areas where the yellow polygons (i.e. representing grassland or cultivated area in 2008) is seen to overlay forest or shrub vegetation in the historical photographs, or where blue polygons (shrub / secondary forest in 2008) are seen to overlay open grassland or cultivated area.

Results

The analysis of historical aerial photography in the study area certainly does confirm the assertion that the spatial distribution of agricultural activity has changed since 1937. The results of this analysis also support the local elder's description of agricultural land being abandoned and then encroached by woody vegetation. In several cases land that was being used for agriculture as late as 1956 is now noted to be largely shrubland / secondary forest, with no sign of agricultural activity present (sites 5, 6 and 7).

In other areas however, large areas of forest have been cleared since 1956 and are currently being actively farmed (sites 1, 3 and 4), indicating an expansion of activity into these areas in the period between 1956 and 2008.

Some areas have remained relatively consistent in the area under agriculture (site 2) throughout the period of analysis.

The results of this study show varied changes in the distribution of agricultural activity in the study area. There does not appear to be a significant decrease or increase in activity in this broader area but rather a shift in distribution. Reasons for these localized changes in the distribution of activity should be investigated further to contribute to the understanding of the greater socio-economic context of this region.
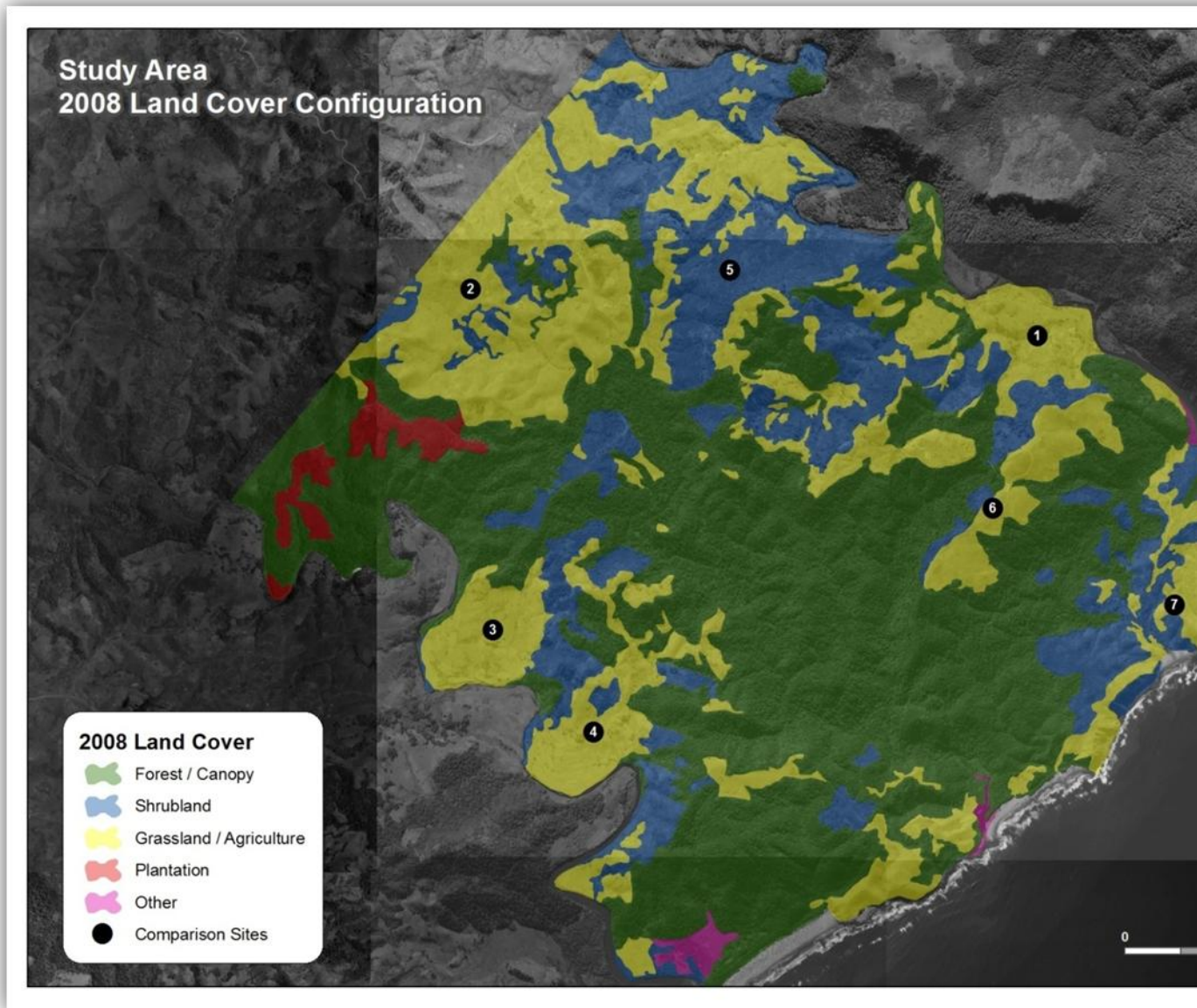
Figure 54 - 2008 Land Cover Configuration

Site 1
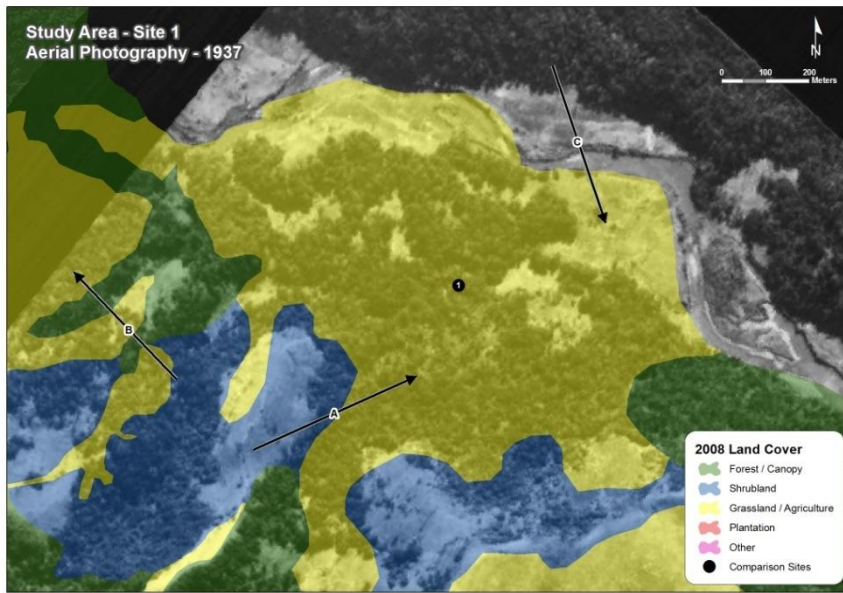
1937 – The areas indicated by arrows A and B are seen to be wooded vegetation. The area indicated by arrow C shows open grassland / cultivated area
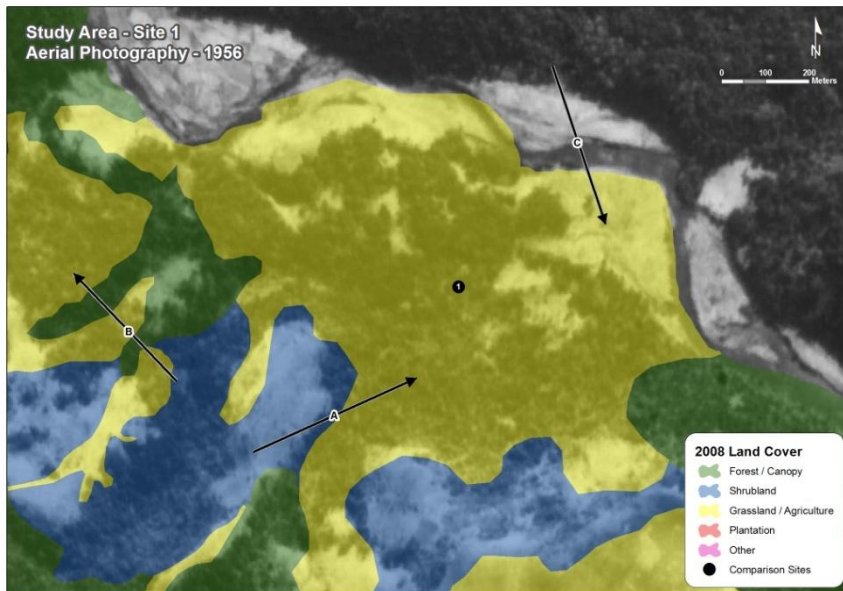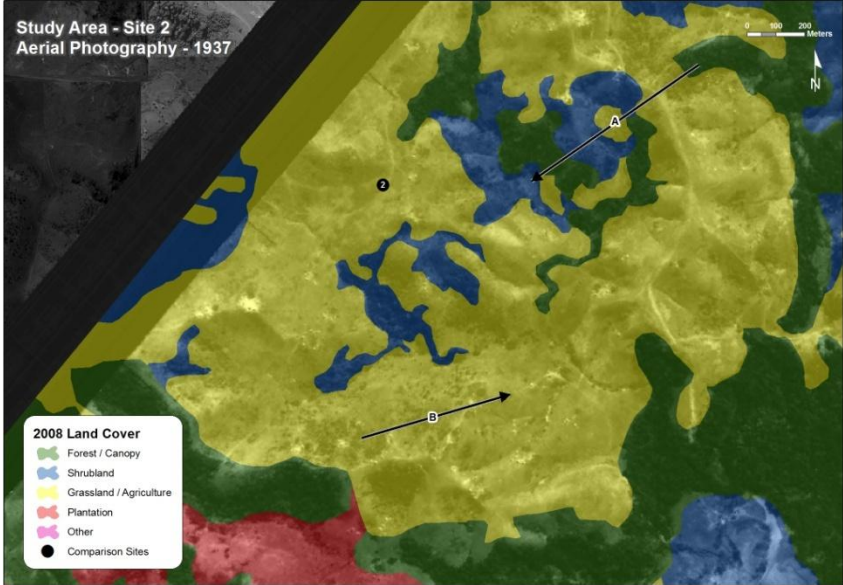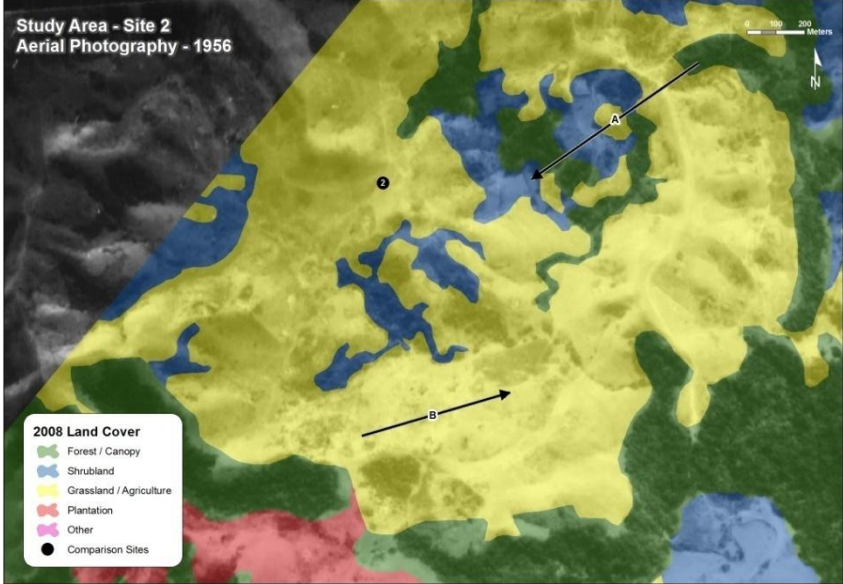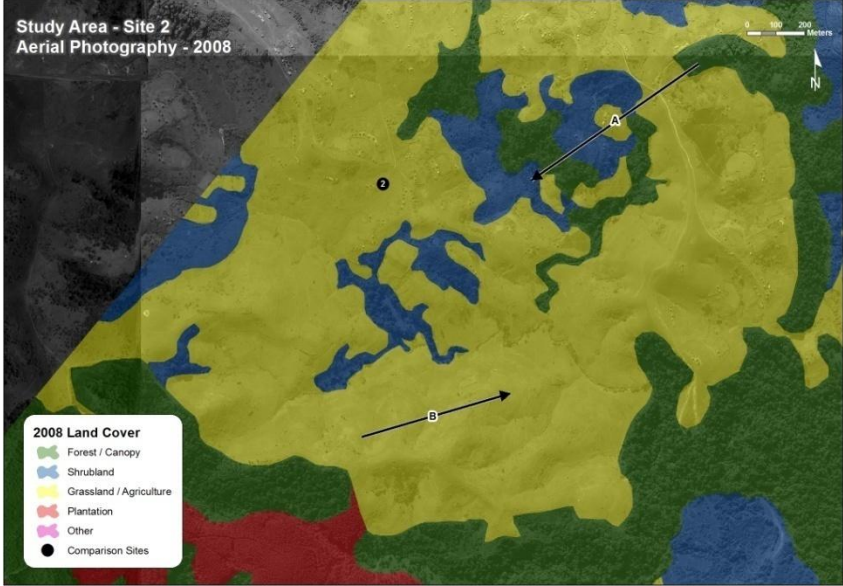

1956 - The area indicated by arrow C remains as it was in 1937 - grassland / open fields. The areas indicated by arrows A and B remain covered by wooded / forest vegetation, indicating no change between 1937 and 1956.
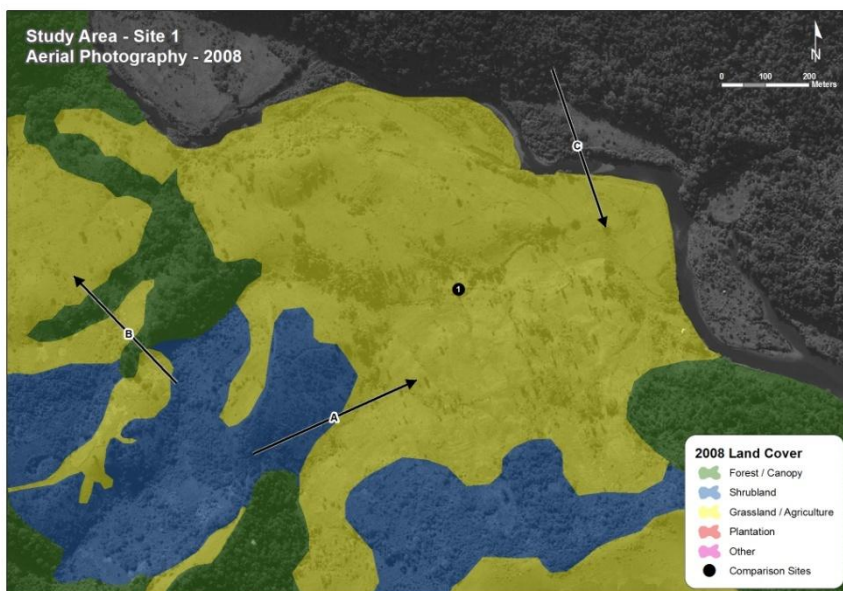

2008 – The area indicated by arrow C is currently largely grassland and cultivated fields as it was in the two past photographs. The areas indicated by arrows A and B however have changed dramatically from wooded vegetation to open grassland and

	cultivated fields.
Site 2	
	1937 – The areas indicated by arrows A and B are seen to be largely open grassland and cultivated fields.
	1956 – As in 1936, the area indicated by arrows A and B are seen to be largely open grassland and cultivated fields. No significant change is noted in this area between 1936 and 1957.
	2008 – The area indicated by arrow A now comprises largely shrubland indicating a cessation of agricultural activity in this small area. The area indicated by arrow B is seen to still be largely open grassland and cultivated fields indicating no significant change.

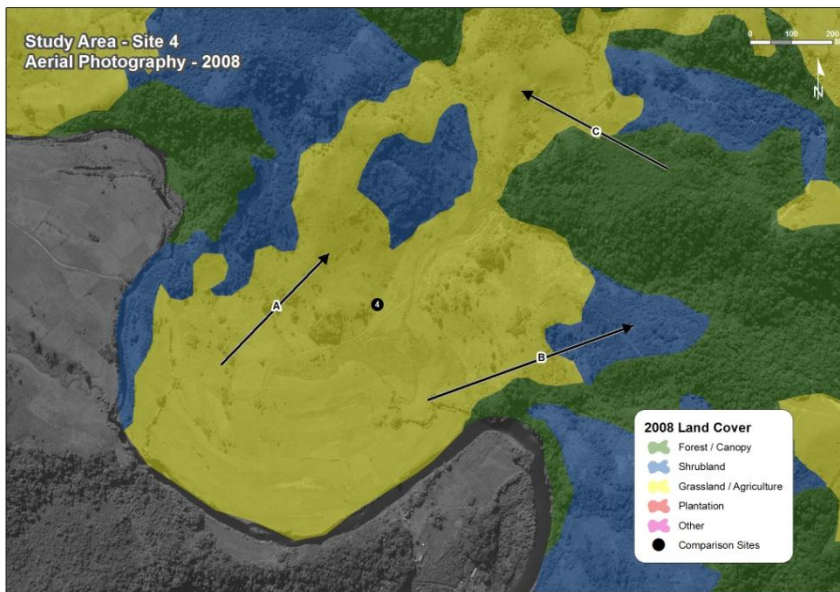## Site 3
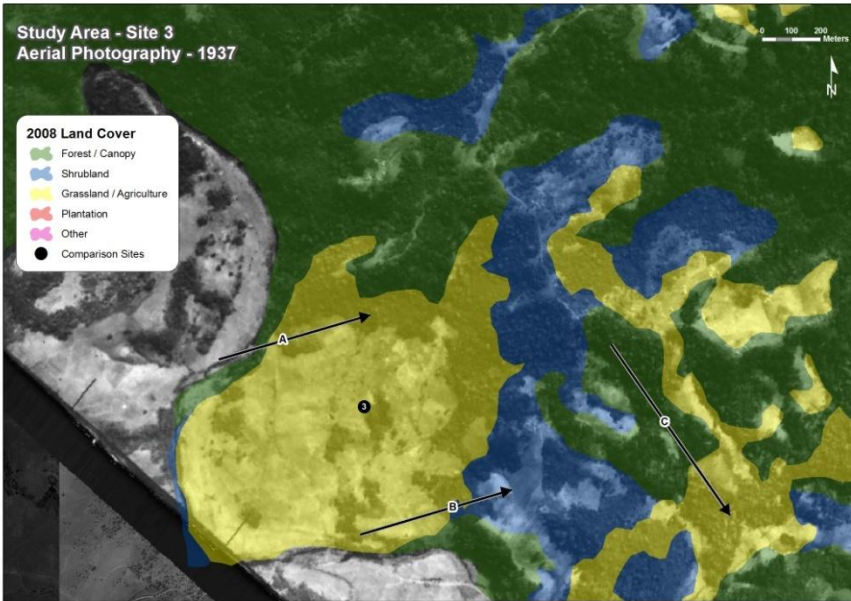
1937 – The areas indicated by arrows A and C are seen to be wooded / forest vegetation. The area indicated by arrow B is open grassland / cultivation.
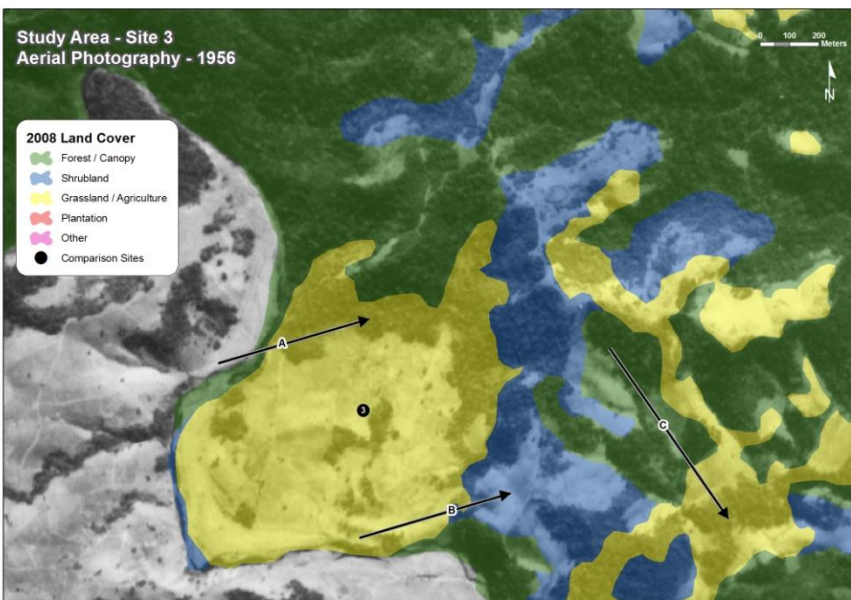
1956 – No significant change is noted over the period 1937 - 1956, and the areas indicated by arrows A and C are still wooded / forest vegetation. The area indicated by arrow B is still open grassland / cultivation.
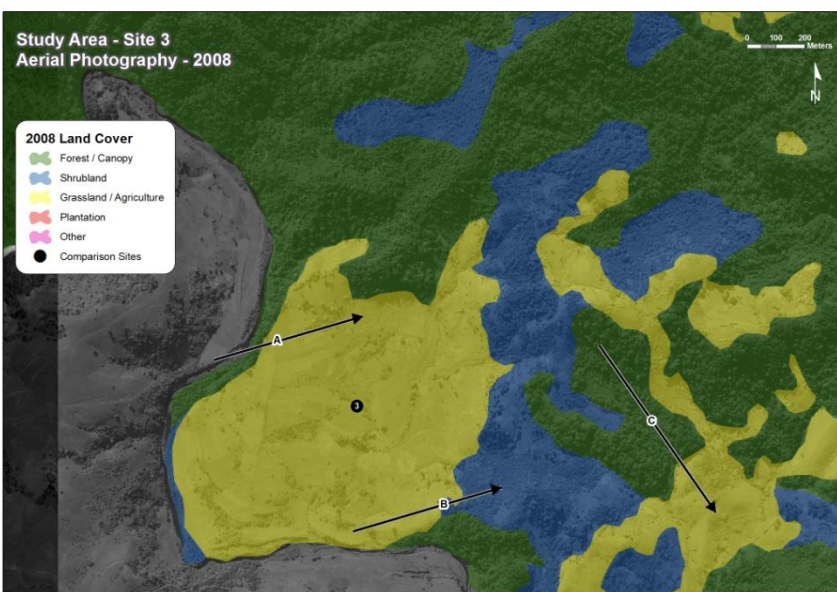
2008 – Significant changes are noted as the areas indicated by arrows A and C are seen to have been cleared of woody / forest vegetation and are now characterised by open grassland and cultivation. The area indicated by arrow B is seen to have changed to shrub / secondary forest

	growth vegetation indicating a cessation of activity in this area.

Site 4
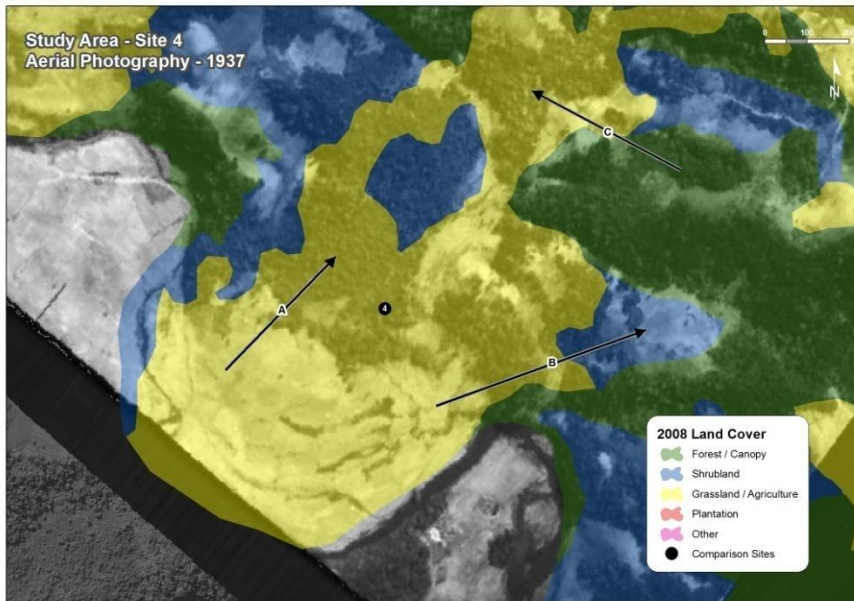
	1937 – The area indicated by arrows A and C are seen to be wooded / forest vegetation while the area indicated by Arrow B is seen to be clear grassland / cultivation with small patches of forest
	1956 – The areas indicated by arrow A and C have shown a small reduction in forest cover area which has been changed to grassland / cultivated area. The area indicated by Arrow B is seen to be largely the same with a slight thinning of the small forest patches.
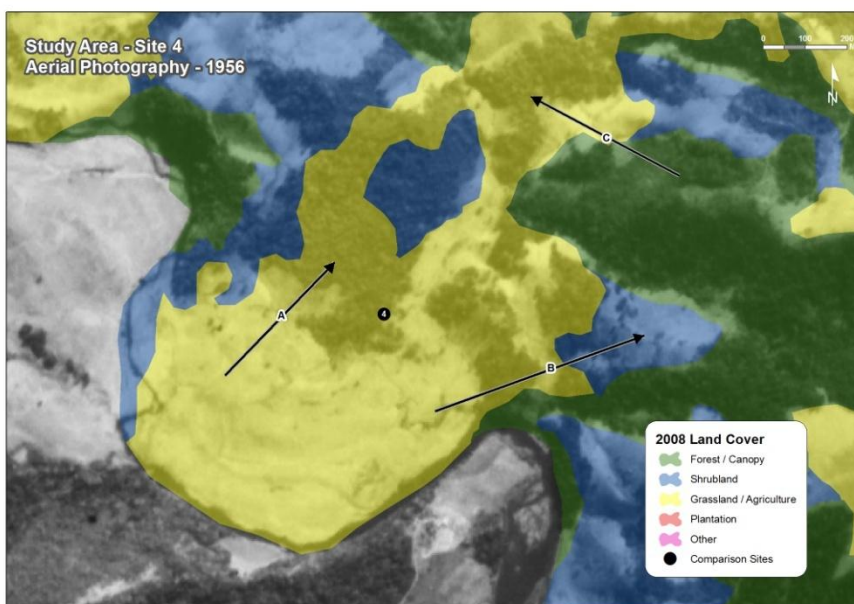
2008 – The areas indicated by arrows A and C show large transformation from forest to open grassland / cultivation. The area indicated by arrow B is seen to have been encroached by shrub vegetation and this would appear to indicate a cessation of activity in that area.
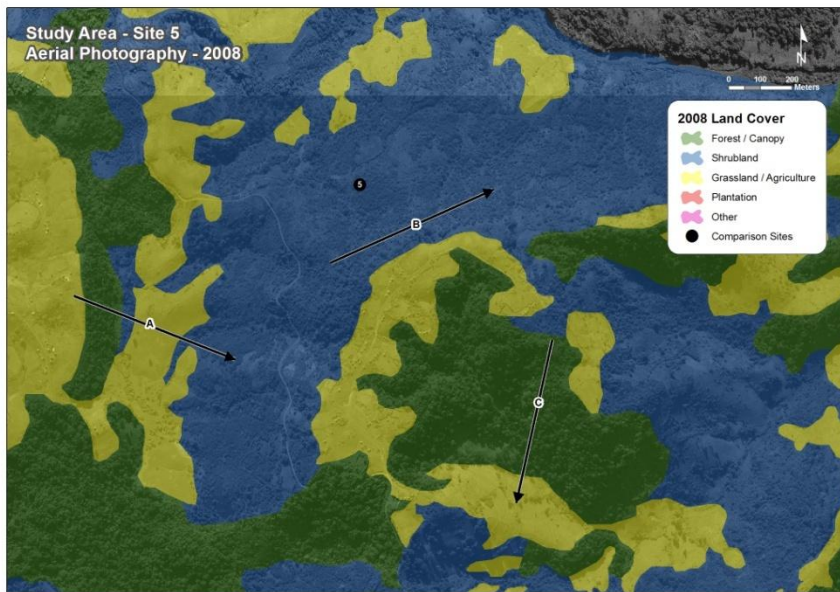
Site 5
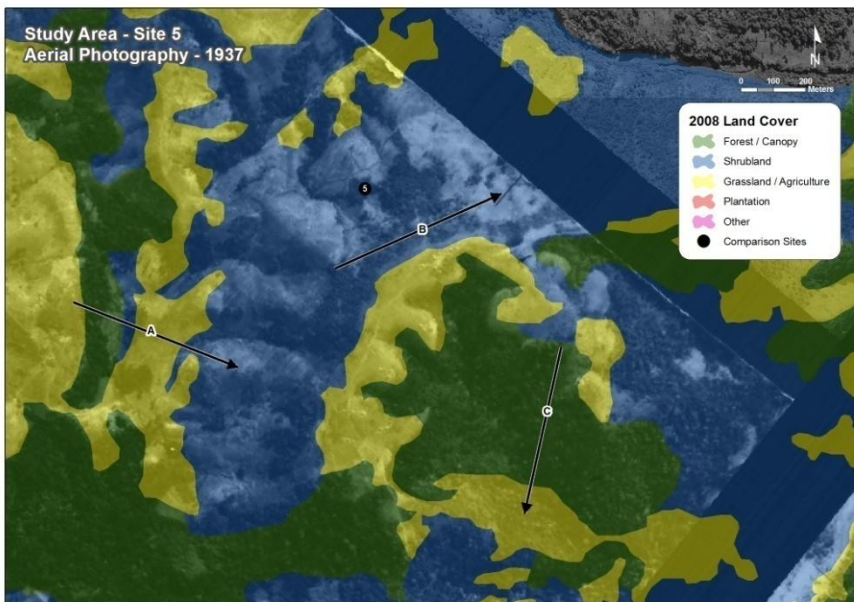
1937 – The areas indicated by arrows A and B are seen to be large patches of open grassland / cultivated area situated on the upper slopes, fragmented by shrub vegetation in the valleys. The area indicated by arrow C is seen to be a wooded area
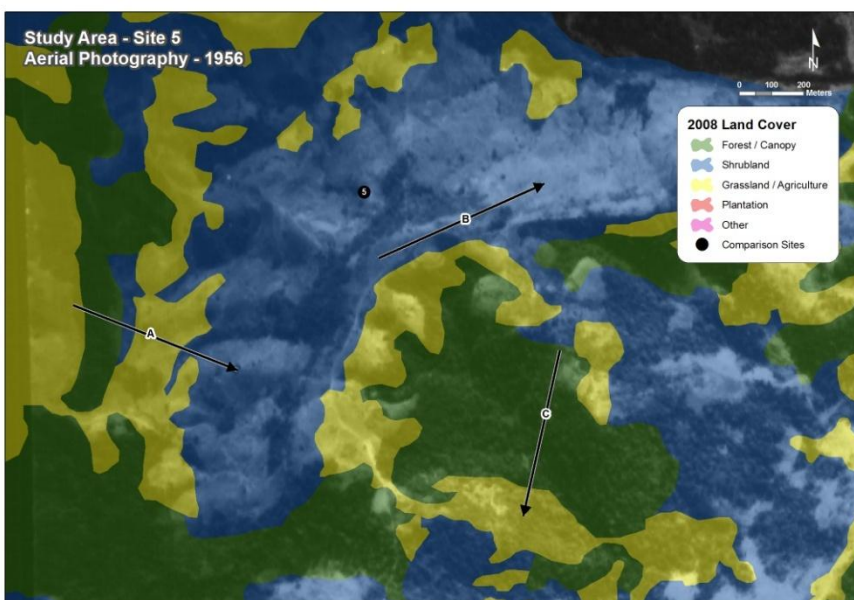
1956 – The areas indicated by arrows A and B is seen to be slightly more open, with some of the shrub vegetation having been cleared and larger areas available for agricultural activity. A small area has been cleared in the wooded area indicated by arrow C

Study Area - Site 5
Aerial Photography - 2008

2008 Land Cover
Forest / Canopy
Shrubland
Grassland / Agriculture
Plantation
Other
Comparison Sites

2008 – The area indicated by arrows A and B is seen to have been almost totally encroached by shrub / secondary forest vegetation indicating a complete cessation of activity in this large area. Very little of the area previously available for agricultural activity is still being used. The area indicated by arrow C has been cleared completely.

Site 6

Study Area - Site 6
Aerial Photography - 1937

2008 Land Cover
Forest / Canopy
Shrubland
Grassland / Agriculture
Plantation
Other
Comparison Sites
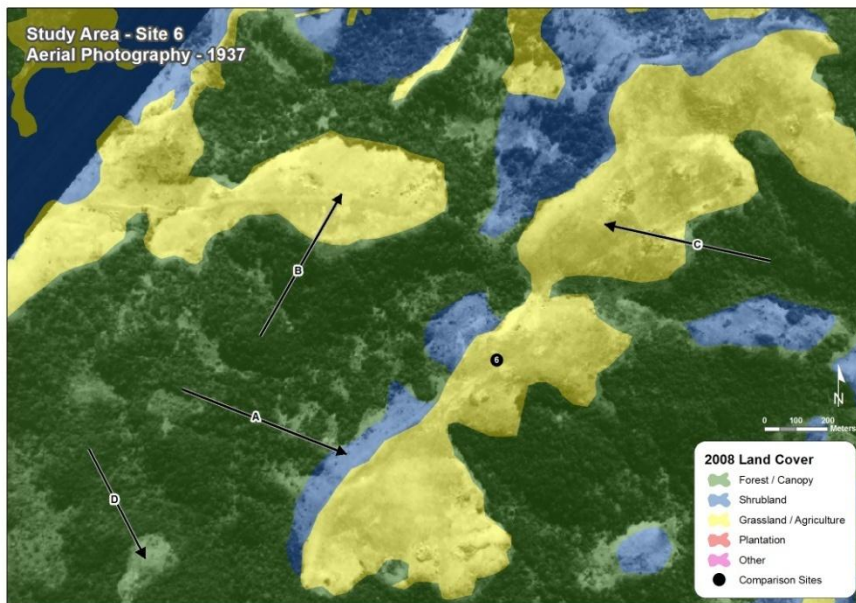
1937 – The areas indicated by arrows A, B, C and D are all seen to be open grassland / cultivated areas, surrounded by forest vegetation.
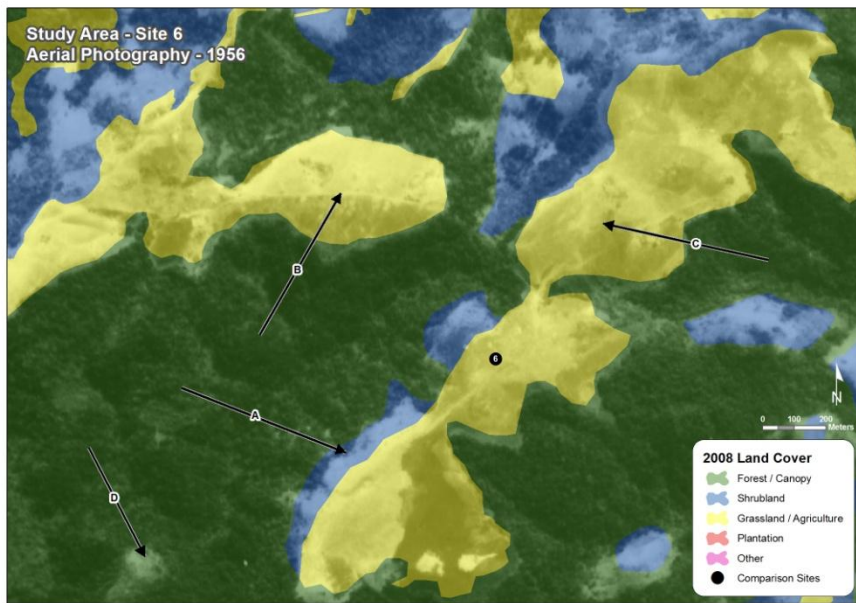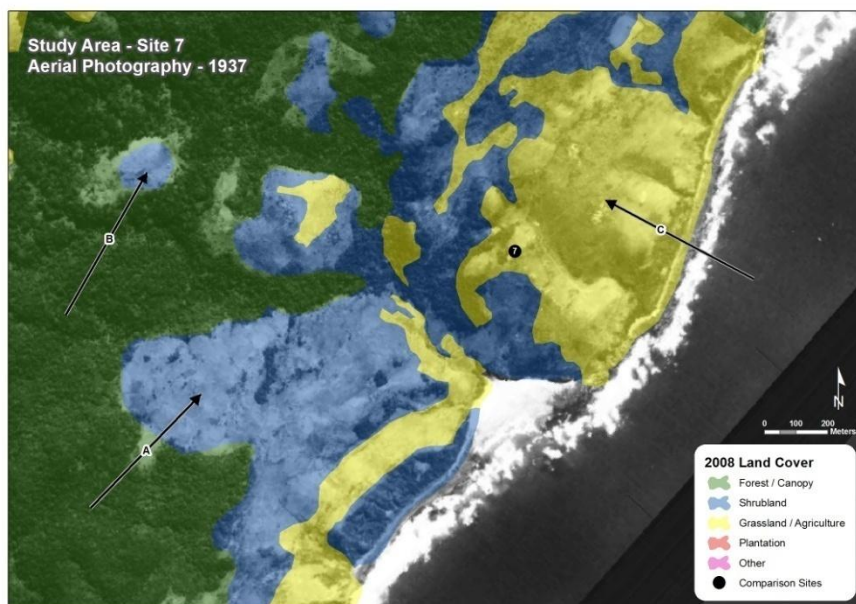
1956 – Very little change is noted since 1937 with the areas consistent in extent and character.
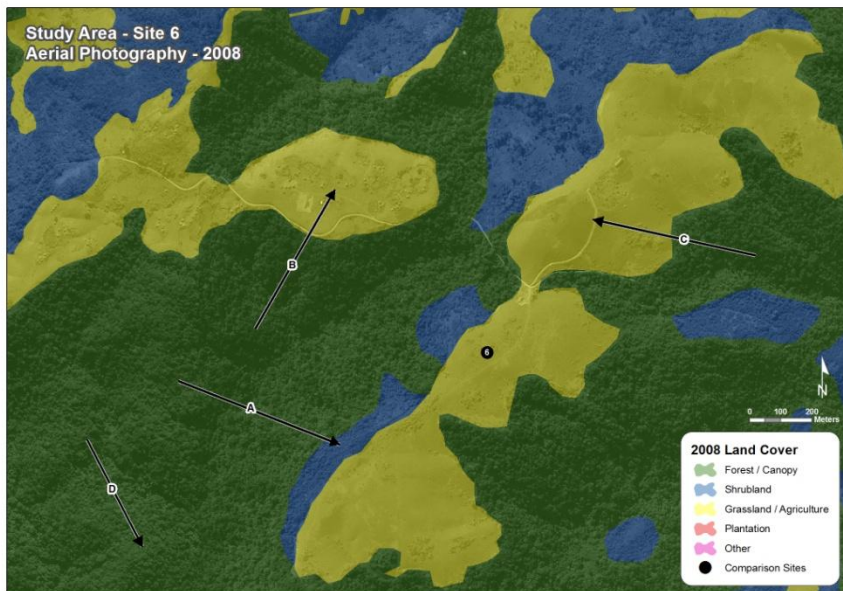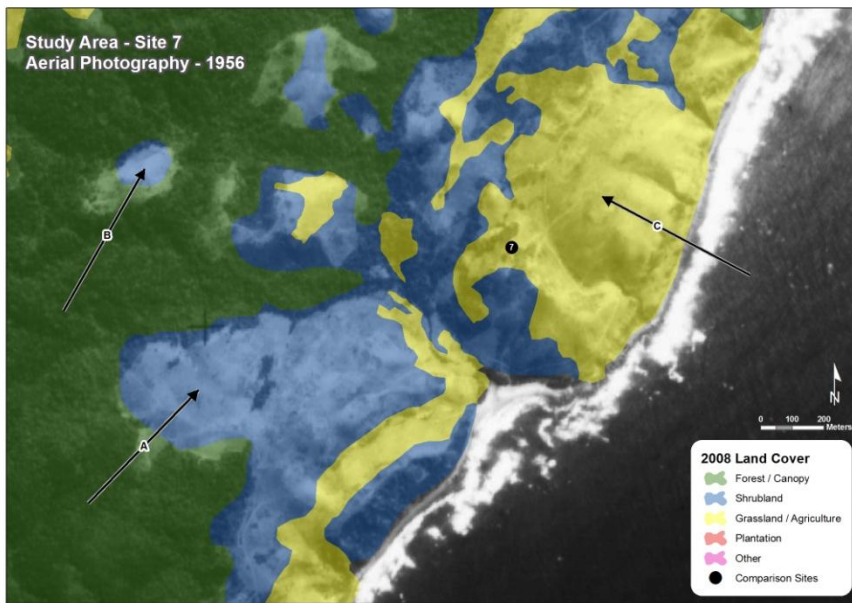

2008 – Encroachment of forest / shrub vegetation is noted in several areas. Examples are indicated by arrows A and D. The majority of open areas however remain largely open (Arrows C and B)
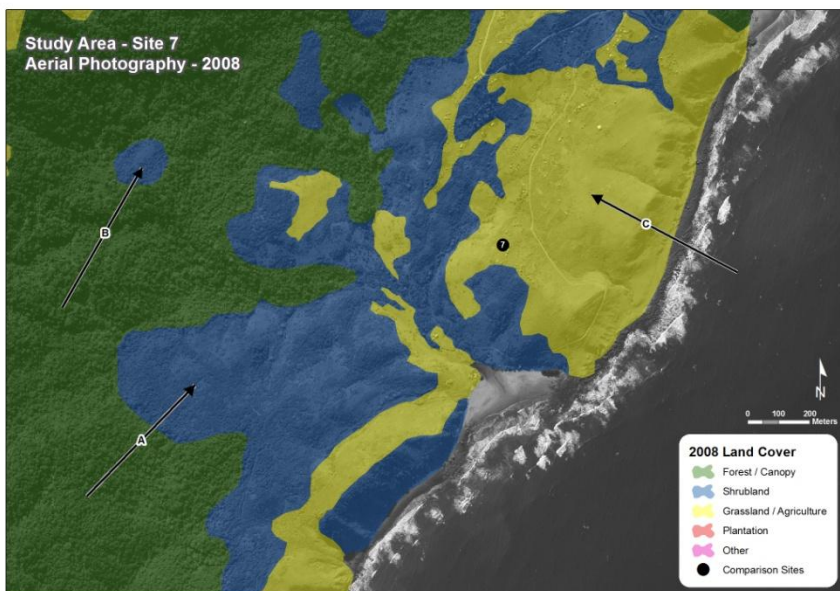
Site 7

1937 – Areas indicated by arrows A, B and C are seen to be open grassland / cultivated areas.

1956 – The extent and character of these areas is roughly the same as was noted in 1937.

2008 – Significant encroachment of woody vegetation (shrubs / secondary forest) is noted over much of the area, particularly in the areas indicated by arrows A and B. The area indicated by arrow C remains largely open.