

UNIVERSITY OF KWAZULU-NATAL

**Cultural Ecosystem Services: Perceptions and Participatory Mapping, A Case Study Of
Buffelsdraai and Iqadi Communities in eThekweni Municipality, KwaZulu-Natal.**

Hlengiwe Precious Kunene

A dissertation submitted in fulfilment of the academic requirements for the degree

of

Master of Science in Geography

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A dissertation submitted in fulfilment of the academic requirements for the degree

of

Master of Science in Geography

In the school of Agricultural, Earth and Environmental Sciences

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Co-supervisor: Dr Sphumelele Lucky Nkomo

December 2018

Preface

This study was conducted in Buffelsdraai and Iqadi, South Africa from June 2016 to December 2018. Associated work was carried out while registered at the School of Agricultural, Earth and Environmental Sciences, University of KwaZulu-Natal, Pietermaritzburg, under the supervision of Dr S.A. Desai and Dr S.L. Nkomo.

This thesis, represents original work by the author and has not otherwise been submitted in any form for any degree or diploma to any University. Where use has been made of the work of others, due acknowledgements are made.

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Hlengiwe Precious Kunene

December 2018

I certify that the above statement is correct and as the candidate's supervisor I have approved this thesis for submission.

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Dr S. A. Desai

December 2018

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Dr S. L. Nkomo

December 2018

Declaration - Plagiarism

I, Hlengiwe Precious Kunene, declare that

1. The research reported in this thesis, except where otherwise indicated, is my original research.
2. This thesis has not been submitted for any degree or examination at any other university.
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Signed:... ..

Hlengiwe Precious Kunene

December 2018

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Cultural Ecosystem Services: Perceptions and Participatory Mapping, A Case Study Of Buffellsdraai and Iqadi Communities in eThekweni Municipality, Kwazulu-Natal.

Abstract

As the demand for Ecosystem Services (ES) continues to grow, the assessment of ES has become important for conservation management. However when compared to other ES, Cultural Ecosystem Services (CES) have been rarely integrated into ES assessments. As a result, research on this particular category of ES is necessary as trade-offs between all types of ES exist. This study assessed the perceived CES in Buffellsdraai and Iqadi communities in KwaZulu-Natal by performing a spatially explicit mapping of these services. These particular communities were chosen because of the two major reforestation projects being carried out within their jurisdiction so as to understand how ecological restoration improves their cultural well-being. Triangulation which is a combination of both quantitative and qualitative methodology was used to assess local community and key informant perceptions of CES as well as to determine the spatial variation of these services in Buffellsdraai and Iqadi. The structured questionnaire survey, participatory rural appraisal (PRA) exercises, focus group discussions were administered to community participants while the structured questionnaire was employed to collect data from key informants of Buffellsdraai and Iqadi, respectively.

CES were identified in both Buffellsdraai and Iqadi communities. Landscape value was identified as the most valued category of CES in both communities. Despite most key informants residing within the communities of Buffellsdraai and Iqadi they showed little interest on the CES subject matter. With the aid of spatial data from the participatory mapping exercises, the study also identified the hotspots and coldspots of CES in both study areas. Hot spots were mainly attributed to landcovers such as forests, bushlands and water bodies while built up dense settlement, grassland and woodlands were hardly attributed to any cultural values thus forming cold spots of CES. The results from this study revealed a vital relationship between the locals and landscape of Buffellsdraai and Iqadi. The locals portrayed a keen interest with interacting with nature which in turn will contribute to maintenance of these landscapes. On this basis, this study proposes the incorporation of CES into ES planning decisions of the eThekweni Municipality, KwaZulu Natal.

TABLE OF CONTENTS

Preface.....	i
Acknowledgements.....	iii
Abstract.....	iv
List of tables.....	xi
List of plates.....	xii
Table of abbreviations.....	xiii
CHAPTER 1	1
INTRODUCTION.....	1
1.1. MOTIVATION FOR THE STUDY	1
1.2. AIM OF THE STUDY:	3
1.3. OBJECTIVES OF THE STUDY:.....	3
1.4. RESEARCH QUESTIONS:	3
1.5. SCOPE AND LIMITATIONS OF THE STUDY	3
1.6. CHAPTER OUTLINE.....	4
1.7. CONCLUSION.....	5
CHAPTER 2	6
LITERATURE REVIEW	6
2.1. INTRODUCTION	6
2.2. THE ECOSYSTEM SERVICES CONCEPT	6
2.2.1. Brief history and development of the ecosystem services concept.....	6
2.3. THE CATEGORISATION OF ECOSYSTEM SERVICES	8
2.3.1. Provisioning services	8
2.3.2. Regulating Services	8
2.3.3. Supporting Service.....	9
2.3.4. Cultural Ecosystem Services.....	9
2.3.4.4. The definition of culture and cultural identity	10
2.4. THE NEED TO INCORPORATE CULTURAL ECOSYSTEM SERVICES INTO ECOSYSTEM SERVICES ASSESSMENTS	10
2.4.1. Regional Trends of Cultural Ecosystem Services publications	11
2.4.2. Frequently studied type of Cultural Ecosystem Services	11
2.4.3. Overview of the gaps in Cultural Ecosystem Services research.....	12
2.5. THE INTERCONNECTEDNESS NATURE OF ECOSYSTEM SERVICES	14
2.6. THE FUTURE FOR ECOSYSTEM SERVICES.....	14
2.7. WILD PRODUCTS AND CULTURE	15

2.7. INDIGENOUS LOCAL KNOWLEDGE AND COMMUNITY DEVELOPMENT PROJECTS	16
2.8. INDIGENEOUS KNOWLEDGE SYSTEMS IN BIODIVERSITY CONSERVATION. 16	
2.9. SUSTAINABLE DEVELOPMENT AND INDIGENOUS LOCAL KNOWLEDGE	18
2.10. CONCLUSION.....	18
CHAPTER 3.....	19
CONCEPTUAL FRAMEWORK.....	19
3.1. INTRODUCTION	19
3.2. SUSTAINABLE LIVELIHOODS APPROACH	19
3.2.1. The sustainable livelihoods approach and culture	20
3.3. CULTURAL ECOLOGY	20
3.4. POLITICAL ECOLOGY.....	22
3.5. CONCLUSION.....	23
CHAPTER 4.....	25
METHODOLOGICAL APPROACH.....	25
4.1. INTRODUCTION	25
4.2. STUDY SITE DESCRIPTION.....	26
4.2.1. Buffellsdraai.....	26
4.2.2 Iqadi	27
4.3. RESEARCH METHODOLOGY.....	29
4.3.1. Qualitative research methodology	29
4.3.2 Quantitative research methodology	30
4.4. DATA COLLECTION	30
4.4.1. Research ethical clearance	30
4.4.3. Secondary data sources	31
4.5. SAMPLING PROCEDURE	32
4.5.1. Participants sampling technique	32
4.5.2. Key informants sampling technique	33
4.5.3. Focus group recruitment strategy.....	33
4.6. RESEARCH INSTRUMENTS.....	33
□ Consent forms	34
4.7.1. Participatory Rural Appraisal	34
4.6.2. Focus group discussion.....	34
4.6.2.1. Participatory mapping exercise.....	36
4.6.2.2. Venn diagrams	37
4.6.2.3. Transect walks	37
4.6.2.4. The structured questionnaire.....	38
4.7. DATA ANALYSIS.....	39

4.7.1. GPS	40
4.7.2. ArcGIS	40
4.7.2.1. Kernel density analysis	41
4.7.3. Google earth software	41
4.8. FIELD WORK EXPERIENCES	41
4.8.1. Buffellsdraai community	41
4.8.2. Iqadi community	42
4.9. CONCLUSION	42
CHAPTER 5	43
DATA ANALYSIS AND DISCUSSION	43
5.1. INTRODUCTION	43
5.2. THE SOCIO-ECONOMIC CHARACTERISTICS OF THE LOCAL COMMUNITY PARTICIPANTS FROM BUFFELSDRAAI AND IQADI COMMUNITIES	44
5.2.1. THE RELATIONSHIP BETWEEN THE LOCAL COMMUNITY AND COMMUNITY REFORESTATION PROJECTS	47
5.2.1.1. Venn diagram results	50
5.3. LOCAL COMMUNITY'S PERCEPTIONS IN RELATION TO CULTURAL ECOSYSTEM SERVICES PROVIDED BY THE LANDSCAPE	53
5.3.1. The frequency of cultural services	54
5.3.2. The spatial distribution of cultural ecosystem services as perceived by residents of Buffellsdraai and Iqadi	55
5.3.3. CES and their relationship to land covers in Buffellsdraai and Iqadi	60
5.3.4. Landscape Beauty	64
5.3.5. Religious and Spiritual value	66
5.3.6. Recreation and Tourism	68
5.3.7. Cultural Heritage	70
5.3.8. Educational knowledge	73
5.3.9. Social relations	75
5.4. KEY INFORMANTS RESULTS	77
5.4.1. KEY INFORMANTS GENERAL BACKGROUND OF THE REFORESTATION PROJECTS	77
5.4.2. CES PERCEPTIONS OF BUFFELSDRAAI AND IQADI KEY INFORMANT PARTICIPANTS TOWARDS THE NATURAL LANDSCAPE	79
5.4.3. KEY INFORMANT PERCEPTIONS TOWARDS PRESERVING CULTURAL ECOSYSTEM SERVICES IN BUFFELSDRAAI AND IQADI	80
5.5. CONCLUSION	83
CHAPTER 6	84
CONCLUSION AND RECOMMENDATIONS	84
6.1. CONCLUSION	84

6.2.THEORETICAL REFLECTIONS	84
6.3. RECOMMENDATIONS.....	85
6.3.1. The Integration of scientific disciplines.....	85
6.3.2. Assessing and mapping interdependent CES.....	86
6.3.3. The spatial dimension of CES.....	86
6.3.4. The need to address trade-offs and synergies in CES framework	87
REFERENCES:	88
APPENDICES	110

List of figures

Figure 4.1: Location map of the Buffellsdraai and Iqadi communities in eThekweni Municipality, KwaZulu-Natal.....	26
Figure 5.1: Displays the gender of Buffellsdraai and Iqadi participants.....	44
Figure 5.2: Venn diagram that was illustrated by Buffellsdraai participants during the focus group discussion.....	50
Figure 5.3: A Venn diagram that was illustrated by Iqadi participants during the focus group discussion.....	52
Figure 5.4: The spatial distribution of the perceived CES in Buffellsdraai, eThekweni Municipality in KwaZulu-Natal.....	56
Figure 5.5: The spatial distribution of the perceived CES in Iqadi, eThekweni Municipality, KwaZulu-Natal.....	57
Figure 5.6: The concentration of each perceived type of CES in Buffellsdraai, KwaZulu-Natal in no particular order.....	58
Figure 5.7: The concentration of each perceived type of CES in Iqadi, KwaZulu-Natal in no particular order.....	59
Figure 5.8: Landcover map of Buffellsdraai in eThekweni Municipality, KwaZulu-Natal.....	61
Figure 5.9: Landcover map of Iqadi in eThekweni Municipality, KwaZulu-Natal.....	62
Figure 5.10: A) is the perceived CES points in relation to landscape values of Buffellsdraai participants B) is the perceived CES points in relation to landscape values of Iqadi participants.....	64
Figure 5.11: A) is the perceived CES points in relation to religious and spiritual values of Buffellsdraai participants B) is the perceived CES points in relation to religious and spiritual values of Iqadi participants.....	66
Figure 5.12: A) is the perceived CES points in relation to recreation and tourism values of Buffellsdraai participants B) is the perceived CES points in relation to recreation and tourism values of Iqadi participants.....	68
Figure 5.13: A) is the perceived CES points in relation to cultural heritage values of Buffellsdraai participants B) is the perceived CES points in relation to cultural heritage values of Iqadi participants.....	70
Figure 5.14: A) is the perceived CES points in relation to educational knowledge value of Buffellsdraai participants B) is the perceived CES points in relation to educational knowledge value of Iqadi participants.....	72

Figure 5.15: A) is the perceived CES points in relation to social relation values of Buffellsdraai participants B) is the perceived CES points in relation to social relation values of Iqadi participants.....75

List of tables

Table 5.1: The relationship between gender and occupation for Buffellsdraai and Iqadi participants	46
Table 5.2: Responses of participants from Buffellsdraai and Iqadi community concerning the community reforestation projects	48
Table 5.3: The perceived location of Buffellsdraai and Iqadi participants away from the project site	49
Table 5.4: The frequency of perceived CES from of Buffellsdraai and Iqadi	54
Table 5.5: Buffellsdraai and Iqadi key informant responses relating to their place of residence	77
Table 5.6: Buffellsdraai and Iqadi key informant responses in relation to the cultural use of landscape of communities	78
Table 5.7: Buffellsdraai and Iqadi key informant responses with regards to the number of years working in the project communities	79

List of plates

Plate 4.1: The Buffelsdraai landfill site in eThekweni Municipality, KwaZulu-Natal.....	28
Plate 4.2: Inanda mountain escarpment in eThekweni Municipality, KwaZulu-Natal where the Inanda forest community reforestation project adjacent to Iqadi community is taking place.....	29
Plate 4.3: Buffelsdraai participants getting ready to be divided into groups for the focus group discussion.....	36
Plate 5:1: Female children waiting to collect water from the nearby river for human consumption.....	45
Plate 5.2: Different types of landcovers observed along the Inanda dam in Iqadi, eThekweni Municipality, KwaZulu-Natal.....	63
Plate 5.3: The scenic beauty of the Inanda dam and Inanda Mountain.....	65
Plate 5.4: The Shembe circle which is one of the renowned South African churches as witnessed in the Buffelsdraai community.....	67
Plate 5.5: A) The parked canoes on the edge of the Inanda dam B) The Msinsi resort witnessed near the Inanda dam.....	69
Plate 5.6: Mama Mangubane, an elder in the community who ensures that cultural values and practices are passed to young generations.....	71
Plate 5.7: Above is the Buffelsdraai education centre located within the project area.....	74
Plate 5.8: local women preparing a garden that is used by the government feeding scheme at the local primary school in Iqadi.....	76

Table of abbreviations

Abbreviation	Full Term
CCBA	Climate, Community and Biodiversity Alliance
CAMPFIRE	Communal Areas Management Programme for Indigenous Resources
CES	Cultural Ecosystem Services
OCF	Our Common Future
DRAP	Durban Research Action Partnership
ES	Ecosystem Services
FAO	Food and Agriculture Organisation
GPS	Global Position System
GIS	Geographical Information System
IDP	Integrated Development Plan
IMCRP	Inanda Mountain Community Reforestation Project
ITB	Ingonyama Trust Board
ITFL	Indigenous Trees for Life Programme
IUCN	International Union for Conservation of Nature
KZN	KwaZulu-Natal
MDGs	Millennium Development Goals
MEA	Millennium Ecosystem Assessment
NGOs	Non-Governmental Organisations
PRA	Participatory Rural Appraisal
PES	Payments for Ecosystems
SDGs	Sustainable Development Goals
SLA	Sustainable Livelihoods Approach
SPSS	Statistical Package for Social Sciences
UNFCC	United Nations Framework For Climate Change
UNMFC	United Nations Momentum for Change

UNESCO	United Nations Scientific and Cultural Organisations
UNEP	United Nations Environmental Programme
WCED	World Commission on Environment and Development
WESSA	Wildlife Environmental Society of South Africa
WCT	Wildlands Conservation Trust

CHAPTER 1

INTRODUCTION

1.1. MOTIVATION FOR THE STUDY

In the midst of pressing environmental issues such as climate change and global warming, reforestation has increasingly become important (Butt et al., 2015; Colfer et al., 2016). Its significant contribution in reducing various impacts to the environment and improving human well-being is widely recognised (Riecher, 2014; Cunningham et al., 2015; Irving, 2018). Reforestation is defined as the "establishment of forest on land that has been cleared of tree cover on recent past" (Suphey and Safeer, 2017:219). However just as reforestation can assist the recovery of degraded forests, it may also contribute to reinforce direct and indirect cultural benefits provided by the natural landscape (Brancalion and Chadzon, 2017; Food Agricultural Organisation FAO, 2018).

Chan et al. (2012) refer to cultural ecosystem services (CES) as the non-material benefits that the natural environment provides for humans resulting in a human-nature relationship. This relationship is often mediated by experiences that arise when humans interact with nature such as the social, cultural or psychological factors along with biophysical features (Plieninger et al., 2014; Sanna and Eja, 2017). Unlike other types of ecosystem services (ES) such as provisioning and regulating services whose assessments are quantitative, the assessment of CES depends on the perceptions of people who interact with ecosystems of interest (Lopez-Santiago et al., 2014). However Martin-Lopez and Montes, (2012) stresses the need to integrate CES along with other ES to better inform decision-making processes. While Hernandez-Morcillo et al.(2013) believes that the integration of various assessment methodologies is crucial as synergies between ES do exist. In support of this argument, recent studies have shown that applying a set of different methodologies to assess CES can help to better understand the importance of CES (Lopez-Santiago et al., 2014; Costanza et al. 2014; Katz-Gerro and Orenstein, 2015).

Nevertheless, despite of the growing importance to assess CES, it is noted that only a few perception studies have been carried out, due to the lack of background on how to assess the value of CES (Holleland et al., 2017). Riecher (2014) mention that perception studies help bridge any gaps and possible misunderstandings in an under-developed research area than quantitative or monetary studies. Wratten et al. (2013) state that negligence of socio-cultural perceptions in restoration projects can render restoration efforts unfruitful. Furthermore, knowledge about the spatial location of CES could greatly benefit land use strategies as mapping of CES can help to define areas of priority for ES management (Plieninger et al., 2013).

Based on the given background, this study presents an opportunity for the Buffellsdraai landfill site and Inanda mountain community reforestation projects to be the chosen projects that will be researched according to cultural values that local communities attach to nature. The Buffellsdraai landfill site and Inanda mountain community reforestation projects were both initiated in 2010, as a means to decrease the carbon footprint during the 2010 World Cup in Durban (Douwes et al., 2015). Local communities were engaged in these community reforestation projects in an attempt to restore the ecological integrity of their surrounding landscape (Roy, 2015). Buffellsdraai landfill site and Inanda mountain community reforestation projects are examples of flagship restoration projects in South Africa. These projects aim at increasing the resilience and adaptive capacity of ecosystems, while providing increased ecosystem goods and services that benefit local communities (Filho et al., 2017; Landis, 2017). Bullock et al. (2011) and Reynauld (2017) argue that most ecological restoration projects usually focus on what the value is than the value that is attached by people often disregarding the relationship between ecosystems and culture.

This study will address the shortfalls in the way restoration projects have been undertaken in rural communities by recognising culture as an important aspect and an indicator for ecological success of reforestation projects. Moreover, this study will aid in the identification of the perceived CES provided by different land covers within Buffellsdraai and Iqadi to recognise cultural values that local communities attach to the natural landscape. The identified CES will be incorporated to spatial planning of the eThekweni Municipality in order to assist in biodiversity conservation and cultural heritage preservation. The integration of both spatial and qualitative

data used in this study will contribute to understanding the link between ES, biodiversity and local cultures, as well as inform education awareness such as making the local communities aware on the importance of preserving the environment.

1.2. AIM OF THE STUDY:

- The aim of this study is to assess perceptions with regards to CES in Buffelsdraai and Iqadi communities to support CES planning decisions within the eThekwini Municipality in KwaZulu-Natal

1.3. OBJECTIVES OF THE STUDY:

- To assess local communities and key informant perceptions in relation to different categories of CES in Buffelsdraai and Iqadi communities in eThekwini Municipality, KwaZulu-Natal
- To perform the spatial distribution mapping of CES as perceived by the locals in Buffelsdraai and Iqadi communities in eThekwini Municipality, KwaZulu-Natal
- To forward possible recommendations to support CES planning decisions within the eThekwini Municipality in KwaZulu-Natal

1.4. RESEARCH QUESTIONS:

- How do local community's perceptions of CES differ from those of key informants in Buffelsdraai and Iqadi communities?
- How the perceived CES are spatially distributed across the Buffelsdraai and Iqadi landscape?
- How will the findings of this research support decision-making on CES planning of the eThekwini Municipality in KwaZulu-Natal?

1.5. SCOPE AND LIMITATIONS OF THE STUDY

A structured questionnaire and PRA exercises were used as primary data sources while the Integrated Development Plan (IDP), census data, journal articles, books, Online books, reports,

web pages and literature related to the research will be used as secondary sources. Triangulation, which is a combination of both the qualitative and quantitative research methods was used to gather data for this study. In this study the quantitative approach comprised of one hundred structured questionnaires and five key informant interviews which were administered to the Buffellsdraai and Iqadi communities, respectively. In addition the qualitative approach focused on PRA exercises. The participatory mapping exercise, Venn diagram and transect walks were PRA exercises undertaken within focus group discussions. The representative sample of a hundred households was drawn from each community in Buffellsdraai and Iqadi, respectively using systematic sampling.

Key informants were sampled using snowball sampling strategy. Posters to recruit focus group participants were distributed in public spaces within Buffellsdraai and Iqadi communities. Gathered data was analysed using the Statistical Package for Social Sciences (SPSS version 24) as well as excel workbook 2016 to give descriptive explanations such as graphs and tables for the analysis of thematic data. Geographic information system (GIS) through the ArcGIS desktop advanced software version 10.3 and Google earth desktop version 7.3 were used for spatial data analysis as well as for creating various maps that accounted for spatial distribution of the perceived CES in Buffesdraai and Iqadi. Limitations encountered during the research study were unwillingness of some participants to participate in the questionnaire surveys as well as time constraints associated with conducting the questionnaire surveys and PRA exercises.

1.6. CHAPTER OUTLINE

In this chapter, the overall context of the thesis was covered. Chapter 2 is a review of previous literature upon which this research draws. It presents an in-depth review of studies on the broad notion of ES framework as a whole. Chapter 3 focuses on the conceptual framework comprising of the sustainable livelihoods approach, cultural ecology and the political ecology in relation to CES. The approaches are discussed in detail, and their relevance as the main guide of analysis in this study is discussed. Chapter 4 describes how the study was conducted in the Buffellsdraai and Iqadi communities. It presents the methodology chosen for the study, data collection methods, sampling procedure, data collection instruments and data analysis. Chapter 5 presents the data and discussion of the main findings based on the questionnaires that were administered to the participants and the PRA exercises that were undertaken during data collection in Buffellsdraai

and Iqadi communities. Chapter 6 is the final chapter that provides the summary in relation to objectives, recommendations and conclusion for this study.

1.7. CONCLUSION

This chapter has introduced the background of conducting this research, aim and objectives of the study, relevance of the study as well as the thesis outline where the content of each chapter is described.

CHAPTER 2

LITERATURE REVIEW

2.1. INTRODUCTION

This chapter provides an overview on past studies that have been done on CES. The aim of this literature review is to provide a broad understanding and the current approaches that assess CES through reviewing various literature on the ES framework as a whole. The literature reviewed is thematically presented into broad topics that are as follows: brief history and development of the concept of ES , the categorisation of ES, the definition and importance of culture and cultural identity, the need to incorporate CES into ES assessment, the interconnectedness nature of ES, the future for ES, indigenous local knowledge and community development projects, indigenous knowledge systems in biodiversity conservation, sustainable development and indigenous local knowledge. The chapter will further identify gaps in CES research and critique the literature reviewed.

2.2. THE ECOSYSTEM SERVICES CONCEPT

For centuries, humans have relied on the goods and services provided by nature, particularly for food and water. Other non-tangible services, such as climate control, water filtration, soil fertility, as well as recreational and cultural services have also become crucial in highlighting the importance of human dependence on natural processes across time and space (Millennium Ecosystem Assessment MEA, 2005). Thus, the concept ES have been developed to aid in understanding of the symbiotic relationship between nature and humans.

2.2.1. Brief history and development of the ecosystem services concept

Although humans have been dependent on nature's ability to provide various services for centuries, the understanding of ecosystem service provision to humans can only be traced back to their health. This was until the mid-1950s when the heavy reliance of humans on the ecosystems associated with an increase in population resulting from the agricultural revolution was recognised. The term payment for environmental services also known as payment for

ecological services (PES) was then introduced. This was an idea that whosoever preserves or maintains an ES should be paid for doing so (Waylen, 2018). The idea of PES was meant to be a cost effective way to encourage stewardship through conservation. But, the PES idea was widely criticised for excluding the non intangible benefits of ecosystems such as aesthetic, recreational, spiritual and religious values (Alston, 2013).

ES is the concept that followed after the pitfall of PES and it became popular in 2005. The year 2005 marks the starting point of ES research. ES research increased significantly after 2005 following the emphasis on the importance of incorporating cultural services in ecosystems assessment by the MEA (Egoh et al., 2012; Baat, 2018). It refers to the benefits that nature provides to humans (Abson and Walmsey, 2014). This was initially drafted in the report titled; the study of critical environmental problems by various scientists and professionals in Massachusetts in 1970. The aim of the report was to examine in detail the impacts of pollution on ecosystems (Boston, 2015). Since then ES has become popular in current academic literature and variations of the term have been used throughout the years (Bocking, 2013).

In 1997, Daily wrote a remarkable book titled: nature's services societal dependence on natural ecosystems that discusses ways in which the earth's natural ecosystems confer benefits to humanity while terming these benefits ES (Schmitz, 2017). Daily defines ES as the conditions and processes through which natural ecosystems and their species that makes it to sustain and fulfil human life (Daily 1997 cited in Schmitz, 2017). Daily's work is known for raising awareness on environmental issues and has since been elaborated by Costanza in 1997 (Yang, 2014). However Loomes and O'Neill (2000) argue that Daily's arguments focused entirely on the environmental economy.

Bocking (2013) further argued that Daily's book was too technical and weighed down by the frequent use of numbers, percentages and monetary values that led to a lot of confusion to people with little or no economic background. Though the term ES was known, it was rarely popular as the environmental services concept was still prominent (Mc Afee, 2012). In 2001, 1300 researchers from various countries called for by the United Nations Secretary-General Kofi Annan established and launched the MEA, a committee that was responsible for assessing human

impacts on the environment (Sander et al., 2013). The MEA focused on ES as well as how changes in them affected and influenced human wellbeing (Jax et al., 2010). The report listed the different types of ES and separated them into four main categories. The ecosystem services concept has then continued to expand and is inclusive of social, economic, cultural as well as conservation objectives which has become the standard in scientific literature (Muller et al., 2010).

2.3. THE CATEGORISATION OF ECOSYSTEM SERVICES

ES is regarded as a new conceptual tool and framework that is used to understand a vast array of benefits that nature provides for people (MEA, 2005). The notion of ES was first popularised by the MEA in 2005. Since then, the term is used in various organisations and governments around the world to inform environmental decision-making (Chan et al., 2012). The MEA (2005) defines ES as the provision of direct or indirect benefits by nature for people. The MEA (2005:4) mentions that there are four main categories of ES such as the following;

2.3.1. Provisioning services

This service pertains to goods or products that humans obtain directly from nature such as water and food (Chan et al., 2012). The start of the twentieth century was a time when humans have increasingly been dependent on this type of ecosystem service than any other service (Oreinstein et al., 2014). This dependence can be linked to an increase in population following the industrial era, where the population doubled from 4 to 6 billion between years 1950 to 2000 (Holms, 2017). Due to poverty, migration and population growth showed to be higher in developing countries (Holms, 2017). Thus, this increase in population added a strain on food production which also placed a demand on the sustainability of natural resources.

2.3.2. Regulating Services

This type of ES in which nature maintains the conditions conducive to human life. This particular service is responsible for the control of natural systems (Plieninger et al., 2013). They include regulation of climate through the storing of carbon and control of local rainfall, the removal of pollutants by purifying the air and water (Lead, 2016). However over the past century people have used and changed the habitable environment by altering the very regulating services

that give life to all ecosystems (Maler, 2011). Most alteration have been done on the climate regulation service of ecosystems, through land use changes such as deforestation that have contributed to increases in the amount of carbon dioxide in the atmosphere (Caputo, 2017). These have had dire effects not only on the environment but also on humans, by exposing human populations to various diseases (Patz, 2015).

2.3.3. Supporting Service

This type of ES is considered least important in terms of benefit provision but it is fundamental for the functioning of all ES. It contributes to the production of other services (Martinez- Lopez., 2012). Supporting service is responsible for processes such as soil formation and nutrient cycling, which are a necessity to provide for plants and animal's lifecycles (Marsden, 2018).

2.3.4. Cultural Ecosystem Services

CES is defined as the “non-material or intangible benefits that people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation and tourism and aesthetic experiences” (MEA, 2005:10-11). However the concept of CES has had an evolving definition over years. Costanza (1997:54) defines cultural services as the “aesthetic, artistic, educational, spiritual and scientific values of ecosystems”. The MEA (2005:10-11) expands this definition to include the “the non-material benefits people obtain from ecosystems through spiritual enrichment, cognitive development, reflection, recreation, and aesthetic experiences”. Marsden (2018) and Sinare (2016) state that cultural services are an anthropocentric human benefit that individual humans gain from their awareness, appreciation and inspiration of the natural world and from their interaction with the ecosystems such as the appreciation of the natural scenery. Thus, it can be argued that the various definitions indicate the manner in which ecosystems generate knowledge and support people's experiences (Chan et al., 2012).

While ES and the benefits they provide is necessary to sustain socio-economic and cultural needs, many ES have not been easy to observe until they are endangered (Leyshon, 2014). Therefore, it becomes a priority to understand the value of ES and to integrate them into the broader conservation framework.

2.3.4.4. The definition of culture and cultural identity

Culture is defined as the various life patterns that human beings in a given society learn from their elders and pass onto the younger generation (Storry et al., 2016). Culture is imprinted in the individual as an accepted way of living in a society (Mulcahy, 2016). Cultures are considered the main influences in people's lives determining their values and ways in which they view the world (Eliot, 2014). Human beings cannot hold themselves apart from some form of cultural influence (Hanson, 2013). Each individual belongs to a certain culture. Each culture provides an individual with some sense of identity, moral sense as well as standards of acceptable and unacceptable behaviour (Sobo, 2016).

Cultural identity refers to the belonging of a particular culture (Gruen, 2011). Cultural identity can refer to two different meanings. First, it can be used as a reference to the collective views that a given group represents (Graves-Brown et al., 2013). A second use of the concept is where the identity of the individual is in relation to his or her culture (Pulis, 2014). Cultural identity also takes the form of names which distinguishes the person. For instance one may refer to themselves as an African, which is likely to be recognised by others (Beecroft, 2010). This shows that cultural identity is embedded in the psychological stance of the individual (Mulcahy, 2016).

2.4. THE NEED TO INCORPORATE CULTURAL ECOSYSTEM SERVICES INTO ECOSYSTEM SERVICES ASSESSMENTS

As a result of diversity in services that ecosystems provide to humans, a multidisciplinary approach integrating various scholars such as ecologists, social scientists and economists in ES assessment is crucial (Aronson, 2012; Dymond, 2013). Yet, research shows a huge gap in understanding CES (Takeuchi, 2010; Plieninger et al., 2013; Leyshon, 2014; Fish, 2016). This gap is a result of the absence of the guidelines for identifying cultural services as well as to include them into assessments. As compared to cultural services, provisioning and regulating services are considered as having stronger linkages to human wellbeing (Bugalho et al., 2011; Daniel et al., 2013). Fewer appraisals of CES owe it to their non-monetary value, inconsumerability and intangibility, which is the opposite of provisioning and regulating ES

(Laband and Lockaby, 2013). Unlike other ecosystem services, cultural services are co-produced. They are not just a product of ecosystems but arise from the interaction between humans and ecosystems (Chan et al., 2012; Leyshon, 2014). Irrespective of their use, cultural services have an intrinsic value and their value depends on their contribution to an individual's physical, mental and spiritual well-being. Therefore, such characteristics are important for ecosystem conservation and failure to assess CES results to their loss or degradation which in turn jeopardises the cultural value that is linked to the cultural identity and integrity of the people (Lui, 2013; Hiron et al., 2016). Assessment of these services is therefore important for understanding ecosystem delivery and associated societal values, especially because culture is a vital factor when attempting to negotiate trade-offs within ecosystems (Fitcher et al., 2012; Brancalion and Chadzon, 2017; Wangai et al., 2017). They also play an important role in promoting inclusion, social cohesion whilst also contributing to shared cultural identity in rural communities (Brancalion and Chadzon, 2017; Milcu, 2013)

2.4.1. Regional Trends of Cultural Ecosystem Services publications

The MEA publication of 2005 played a huge role in ecosystems services research. Since then, there has been an increase in studies focusing on CES (Dymond, 2013). Although a bulk of the studies on CES are carried out in Europe (Hester and Harrison, 2010; Ortega et al., 2015; Zandersen et al., 2017), similar studies have been carried out in America (Lindjem et al., 2015; Ferrini et al., 2017), Africa (Keitumetse, 2016; Chimakonam, 2017) as well as Asia (Chen and Chua, 2015; Morand et al., 2017) with recreation and tourism as the most studied type of CES (Vihervaara, 2010). This result correlates to a study by Cooley (2013) which indicates that most CES studies are conducted within Europe as it is regarded as the biggest tourism market in the world, as the international tourists arriving annually (WTO, 2015). The primary type of CES in Africa and Asia is cultural heritage. Africa and Asia constitutes a majority of traditional communities that are rooted in cultural beliefs (Hayha and Franzese, 2014).

2.4.2. Frequently studied type of Cultural Ecosystem Services

Research regarding the type of CES that is most studied suggests that cultural services assessment still remains arbitrary and largely limited to marketable services such as tourism due to its quantifiable nature (Fish, 2016). This argument concurs with other studies by (Milcu, 2013; Hernández-Morcillo et al. 2013) that indicate a link between quantifiable and or marketable

cultural services such as tourism in developed countries. Europe followed by America has most studies on cultural services (Milcu, 2013). However these studies are found to focus only on tourism and recreational CES (Martín-López et al., 2012; Plieninger et al., 2013). This is because tourism plays a huge role in the economies of Europe and America (Bonham and Mak, 2014). These regions are considered the largest sources and recipients of international tourists due to the unique beaches and designed natural areas used for recreation (Peronni, 2016).

Developing countries such as those in Africa and Asia have an almost equal appreciation of all cultural services despite that cultural heritage services seem to be more prominent in Africa compared to other continents (Philips, 2015). Cultural heritage relates to places or landscapes which are valued for the cultural connotations they have, historical buildings and other physical remains (Martín-López et al., 2012). Cultural heritage is also linked to cultural identity and is developed in respect of space and time (United Nations Scientific and Cultural Organisation UNESCO, 2011). Various types of ecosystems all around the world have played an important role in defining the cultural identity of people (Holleland, 2017). People living in developing countries have manipulated ecosystems to suit their cultural needs, like for instance the thicket forest ecosystem in the Eastern Cape of South Africa is used by a certain ethnic group known as Amakhosa who believe that the forest is their God because of the cultural benefits they derive from it (Cocks et al., 2012). In addition, generations have created stories of their lives within the environment that surrounds them and these are usually associated with history of their cultures (Holleland, 2017). Furthermore, it also allows for automatic sense of unity and belonging within a group as well as to effectively understand previous generations and the history (Buss, 2013). Therefore, the loss of these heritages disconnects people from their identities and the past.

2.4.3. Overview of the gaps in Cultural Ecosystem Services research

CES represent a component of ES but have been largely disregarded in the ES research over the past years. Scholars and research on CES argue that the subject is understudied as a result of the challenges that arise when assessing CES, since they are not easily quantifiable through quantitative or monetary approaches like other categories of ES (Guerry et al., 2015; Milcu, 2013; Potchini et al., 2016). Quantitative and monetary methods have been criticised of disregarding the importance of social and cultural perspectives in ES research (Kumar and Srivastava, 2011; Helka, 2016; Zanderson et al., 2017). These approaches have proven

unsuitable for assessing CES, instead qualitative and interdisciplinary methodologies can be used to assess CES (Lindhjem et al., 2017)..

CES have not only attracted researchers from different regions of the world but has also drawn attention from a range of publications, from numerous disciplines, and with the application of various methods for assessment. While researchers have shown a growing interest in the subject of CES over the last 18 years, research reveal that most assessments have focused on ES that are known to have direct benefits to people (Filho et al., 2017). CES are rarely carried out as final research outputs of many studies because of its methodological challenges. Instead, the CES concept is used primarily for conceptual arguments, leaving it void for use in final research outcomes (Milcu et al., 2013; Bieling et al., 2013).

This study also acknowledges the absence of an integrated framework for assessment of CES as a technical challenge, making it difficult to assess CES. This challenge results from the various perspectives or disciplines in which CES are evaluated (Helka, 2016). Cultural services are usually studied from a single specific disciplinary perspective. The diversity of research perspectives on CES assesment has led to the subject being studied in isolation while ignoring the interconnectedness nature of ES (Wratten et al., 2013).

This challenge presents a need for a multidisciplinary approach to studying CES. As, when multiple academic disciplines apply their disciplinary expertise to different areas of a phenomena in question, a better and more enriched understanding of the matter in question can result to insights that would not have been achieved if a single discipline was involved (Morton, 2012; Barton, 2015). This is particularly important in ES research, since mutually beneficial relationships within ES exist. Although ecosystems provide specific and different services, these services cannot be separated of their influence on human well-being (Darvil and Lindo, 2014; Fish and Poschin, 2016). Therefore, ES research requires the integration of all areas of knowledge regarding these services. However this may be difficult to those involved, as this may require scholars to step out of their disciplines and learn about other disciplines. (Daily, 2012; Costanza et al., 2014).

2.5. THE INTERCONNECTEDNESS NATURE OF ECOSYSTEM SERVICES

ES simultaneously provide benefits to humans, which often make it hard to isolate them. A wide range of benefits that can be attributed to either or both material and non-material category can result from the same ecosystem service (Ruijs and Schulp, 2013). An example would be hunting, which some people may depend on for food and economic sustenance but some people may also hunt for recreational purposes (Thompson, 2013). Although synergies are present, trade-offs also exist.

A change in one ES can result to changes to other ES as well. For example, logging for economic gain may have impacts on various other benefits. This for instance can have consequences for those who use the forest for recreational purposes as well as those who depend on the forest to provide firewood (Chiabiah and Taylor, 2018). Even so, these trade-offs are rarely taken fully when decisions relating to ES are made (Guerry et al., 2015).

2.6. THE FUTURE FOR ECOSYSTEM SERVICES

The dependence on ES by humans has increased over the last century (Lac and Mc Henry, 2014). This is accompanied by the depletion of services specially where the service is endangered (Derkzen et al, 2017). Growth in population coupled with consumption, increases the demand for ecosystem delivery, such as food and water (Newlands, 2016). Future projections show that a demand for food crops will grow to an estimated 60% by the year 2050 while water demands will increase to 80% given that water scarcity is already a problem facing the world today (World Health Organisation WHO, 2012). As food and water demands will increase in developing countries, ES delivery will be compromised (Science for Environment Policy, 2015). Studies show that some ES have already shown some degree of declining (Farley, 2012; Newlands, 2016; Rivera-Monroy et al, 2017).

Food security among other things, in this regard is likely to be threatened (Rivera-Monroy, 2017). In developing countries, the percentage of children who are underweight has decreased because of the increase in food supply and the more diversified diets (Christopolos and Pain,

2014). However the child malnutrition status, which is represented as a goal of the Sustainable Development Goals (SDGs), remains high in Africa and Asia (UNESCO, 2017).

Studies reveal that it will be difficult to curb child malnutrition in developing countries worldwide even by 2050 since it increases by 10% annually (WHO, 2012; Oruamabo, 2015). This results in a range of circumstances such as the inability for ecosystems to meet the food demands resulting from population growth, lack of access to food sources in conjunction with climate change (Sahn, 2015).

2.7. WILD PRODUCTS AND CULTURE

Although scientists have tended to ignore the complex relationship between the natural environment and culture, wild products remain crucial in culture around the world. While wild products are solely used for consumption and income, to some traditional community's wild products are regarded as a cultural entity (Matsuyama, 2013). As humans associate and attach their values to wildlife, wild products represent cultural values and heritage for some people (Pfeiffer, 2013). This is particularly true for Africa where cultural practices such as menstruation, funeral or death and child birth is still prominent for rural traditional inhabitants.

- **Menstruation**

In Africa, many ritual practices and customs such as ancestry worshipping, rituals and initiations are associated with the use of various wild products. In the Xhosa culture when a girl starts her menstruation cycle a cleansing ceremony is performed using lemon grass that is boiled along with other herbs in hot water (Kumar and Srivastava, 2011). Lemon grass is believed to possess certain properties that enable it to remove negative energy such as misfortune which is bad luck associated with menstruation (Knight, 2013).

- **Funeral or death**

After the funeral, in the Zulu culture, a meal is prepared and provided for funeral companions. However before they enter the house after coming from the graveyard, a cleansing ritual takes place where everyone must wash of the dust of the graveyard. Pieces of sliced aloe are placed in the water, as it is believed, it will remove negativity (Galomski, 2018).

- **Childbirth**

In the Zulu culture after giving birth to their first child, women undergo a complex bathing process (umgezo) that lasts for seven days. The ritual's purpose is to heal the new mother and celebrate her first child (Shoo, 2011). Activities include constructing the bathing and steam hut, gathering firewood, gathering herbs and making the traditional skirt and accessories for the mother (Tsay et al., 2016). A variety of herbs is used in the ritual to energise and heal the new mother. There is no single prescribed set of plants used in the first bath ceremony and many tribes have their own particular formula (Galomski, 2018).

Grossman (2015) argues that traditions have slightly changed, they may be done a little different from family to family and it may also depend on the community is originating from. But there are some aspects of the traditions that do not change. It is thus important for conservation strategies to consider the cultural factors. Cultural practices play a role concerning the conservation of certain species as in some cultures as certain species are perceived sacred which encourages the locals to protect them (Rodgers, 2017).

2.7. INDIGENOUS LOCAL KNOWLEDGE AND COMMUNITY DEVELOPMENT PROJECTS

Indigenous local knowledge is applied in development projects on the basis of integrating local knowledge into decision-making. In the past, approaches to community development, were likely led by external development practitioners whilst the locals remained spectators (Eversole, 2017). Since the 1990s, participatory development efforts have encouraged to better understand rural livelihoods and to bring rural development strategies more in line with priorities of rural communities (Maunganidze and Halsall, 2016). Arguments in support of indigenous knowledge view it as progress for the rural poor to be influential in the development that affects them. It is also viewed as an approach that has encouraged community development projects to empower communities to achieve sustainable livelihoods (Tsey, 2011).

2.8. INDIGENEOUS KNOWLEDGE SYSTEMS IN BIODIVERSITY CONSERVATION

Throughout time, humans with their cultures have obtained and categorised knowledge about their environments (Hoppers, 2017). The application of indigenous local knowledge has attracted

ecological scientists therefore this knowledge is unwritten but is passed verbally from generation to generation. Individuals in traditional cultures usually know a great deal about the environment, as they work in it every day (Laurence, 2017). The way a culture views things, is an integral part of any information system and must be taken into consideration in any development initiative (Porter- Bolland et al., 2013).

An example of indigenous knowledge may be found in the study by Philipsen 1972 in a case study of the Navajo people of the south-western United States were dying from a mice disease. Where the virus was spread by mice urine and saliva. However, the Navajo people were able to identify the source of the disease without any scientific assistance and took precautions to protect themselves it. This case study demonstrated the importance of indigenous knowledge in culture.

Although only a few traditional cultures follow Western science, many Western scientists consider the knowledge of traditional cultures to be of lower standard and thus often ignore it (Porter-Bolland et al, 2013). However much of the indigenous knowledge has been utilised by Western science, for instance in 2009, a number of African countries including South Africa attempted to officially recognise traditional healers as health care providers. To date, South Africa has made substantial progress in officially recognising traditional medicine and its integration into the primary healthcare system. Traditional healers in a study by Sorsdahl (2009) were seen to play an important role in addressing health care needs in South Africa by offering culturally appropriate treatment.

Hoopers (2017) argue that as traditional cultures disappear, much of their knowledge is lost. Generally, acknowledgement of knowledge is a critical concern in biodiversity conservation and in conservation science. Even if indigenous knowledge does not fit that of Western science, it is crucial in the understanding of the relationship between culture and the natural environment. Biases in participation should be avoided by making sure that local knowledge is included. Furthermore, community projects with the similar concept are encouraged in developing countries to contribute in fostering local values and sustainable development.

2.9. SUSTAINABLE DEVELOPMENT AND INDIGENOUS LOCAL KNOWLEDGE

The term sustainable development was initially recognised in the report of the World Commission on Environment and Development (WCED) and Our Common Future (OCF). The WCED (1984:45) in Holden et al (2014:34) defined sustainable development as “the development that meets the needs of the present without compromising the ability of future generations to meet their own needs”. The WCED, proposed long-term environmental strategies for achieving sustainable development without paying attention to alternative knowledge systems. Indigenous knowledge is regarded the major factor to determine whether people will be able to think of future sustainability (Maunganidze and Halsall, 2016). At present, the importance of various knowledge systems in addressing the pressing problems of development and the environment is recognised. As a result, renowned organisations such as United Nations Environment Programme (UNEP) have made efforts to incorporate indigenous local knowledge into conservation (Aler, 2010; Letcher, 2016). In addition, there is an increasing interest to link indigenous local knowledge and sustainable development for achieving sustainability. This is because indigenous local knowledge is rooted in local practices, cultural norms and standards therefore considered important for sustainable development (FAO, 2012).

2.10. CONCLUSION

This chapter has clearly exposed the current status quo on the subject under discussion. It is noteworthy to understand that most current studies on CES are confined to developed countries. This justifies the need to undertake this study given the spatial distribution of CES and their influence on natural resources conservation especially in developing countries where dependence on natural resources is high. Moreover, the literature review confirm that the existing research is largely limited to marketable CES such as tourism due to their quantifiable nature. The difficulty of assessing CES whilst excluding other ES has been highlighted.

CHAPTER 3 **CONCEPTUAL FRAMEWORK**

3.1. INTRODUCTION

This chapter introduces theoretical and conceptual frameworks that assist in explaining the topic under study. This study used the sustainable livelihoods approach (SLA); cultural ecology as well as the political ecology theory. The roles of conceptual and theoretical framework used in this research are discussed and applied further in the context of the Buffellsdraai and Iqadi communities

3.2. SUSTAINABLE LIVELIHOODS APPROACH

An ecosystem services approach have been realised as a new dawn for SLA by identifying the overlooked cultural benefits (Emery et al., 2016). The SLA is a framework that was developed by Robert Chambers in the 1980s and has further been inspired by Conway in the 1990s (Department for International Development DFID, 2000; Scoones, 2015). Livelihood is defined as the various activities and resources that enable people to live (Lui, 2018).

According to Petersen and Pedersen (2010:10) a livelihood is considered sustainable when it can

- cope with and recover from stress; and shock
- maintain or enhance its capabilities and assets whilst keeping its resource base

The SLA is used to recognise and consider the main issues that affect the livelihoods of the poor people (Mago, 2018). The SLA seeks to understand the livelihood of poor people through identifying constraints and ways to enhance livelihoods. The primary principle of SLA highlights that the poor themselves have to be key actors of development by responding to their expressed priorities. Participation may allow the poor to be empowered instead of being dependent on external assistance (Mphande, 2016). The SLA approach also acknowledges partnerships between all actors including the poor, external donors and the civil society as key to a successful development process (Seratt, 2014). Cortes (2014) identifies another SLA principle which is to ensure that the development process builds on strengths while addressing vulnerabilities of the

poor. He further highlights that at the core of the SLA approach is to understand the influence of diverse cultures on livelihood preference and how this affects the way people understand and appreciate livelihoods (Lui, 2018)

3.2.1. The sustainable livelihoods approach and culture

Culture in the form of individual, community values and meanings play an important role in livelihood sustainability. Consequently, an in-depth understanding of interactions between culture, livelihood sustainability and community development is important (Mc Namara, 2013). However culture remains a complex phenomenon that has been defined in numerous ways, depending on the context in which it has been discussed (Su, 2018). Likewise, it has been seen as both a possible way and constraint in understanding livelihood opportunities (Shakelton et al., 2011). Thus, it has been ignored in development strategies (Tian, 2017). Ellis (2013) argues that the SLA is crucial in understanding cultural benefits of ecosystems. The reason being that what matters to the people would be influenced by the culture in which they adhere to. The link between culture and the SLA is uncovered in the way this approach focuses on people and what matters for them (Mphande, 2016).

This study applied the SLA in order to understand the cultural livelihoods of the people of Buffellsdraai and Iqadi by uncovering and documenting their perceptions. With this approach, this study aimed to minimise the role of the researcher by engaging the communities in the study and observing their daily lives and interactions. This enabled the researcher to gain an in depth understanding of the cultural values of the Buffellsdraai and Iqadi communities.

3.3. CULTURAL ECOLOGY

The concept of ecosystem, which is a type of general system capable of including various activities of human, animals and plants has recently gained wide acceptance (Rumler, 2014). Ecosystem, conceptually unites the plants, animals, humans and their behaviour within a single framework in which the interaction of these components may be studied (Head, 2010).

The concept of cultural ecology arose from a series of environmental issues that emerged in the beginning of the industrial revolution (Head, 1968; Stern and Seifert, 2013). Following this between 1930 and 1949 two main schools of thought formed, on the one hand emerging from the environmental determinists who argued that the physical environment determines human cultures

and societies; the cultural determinists on the other hand argued that human cultures are selective regardless of the physical environment (Wijaskono et al, 2017). In 1950, Julian Steward combined both of these theories thus arguing that the physical environment has nothing to do with cultural development, instead various environmental factors provide options for cultural development (Rumler, 2014). He further identifies humans, culture and environment as the main components that can be studied in conjunction in order to understand how culture is affected by its adaptation to environment (Dendnocker, 2018). He terms this understanding, cultural ecology (Perreault, et al. 2015).

Cultural ecology is defined as the study of relationships between human cultures and the environment, by looking at the ways in which culture is used by people to adapt to their environments (Head, 2010). It is basically an interdisciplinary field, where anthropology and ecology overlap. Cultural ecology recognises that ecological locale plays a significant role in shaping the cultures of a region (Wijaskono et al, 2017). It also looks at the patterns of human behaviour or culture in relation to the use of the environment and assesses how the different aspects of culture influence these patterns of behaviour (Sutton and Anderson, 2016).

However starting in the late 1970s, criticisms from the political ecologists arose against the cultural ecology theory. Political ecologists argued that cultural ecology ignored the connections between the local-scale systems they studied and the global political economy (Zapf, 2016). Despite this, cultural ecology has over time allowed various disciplines to enter common ground from their specialist subjects (Sutton and Anderson, 2016).

With this theory, the study aimed to acknowledge the role of natural landscapes as places of interaction between culture, humans and nature. Furthermore the cultural ecology theory explains that attending to either culture, humans and the environment in isolation is insignificant. Instead, interrelations among them need to be studied as no one of these exist without the influence of the other.

3.4. POLITICAL ECOLOGY

The sustainable development debate arose in the 1970s as a result of the growing public concerns of limits to the earth's capacity in dealing with the environmental crisis. The Brundtland report of 1987 titled our common future that was first presented in the Stockholm conference in 1972, is still the approach that it is possible to combine the concerns of economic growth with the environment. However there were concerns that this approach does not target the root of the problems such as the economic and political processes from which the environmental problems are created. It was at that time political ecology was developed as a research field, to contribute to the understanding of the growing environmental problems.

Political ecology was introduced by Eric Wolf in 1972 (Atkin, 2016). This theory basically analyses how politics and economics relates to the natural landscape. The political ecology theory proposes that political and economic processes need to be considered in order to understand environmental problems (Boenhert, 2018). Environmental problems cannot be understood in isolation from the economic and political contexts within which they are created (Perreault et al, 2015). It further argues that unequal power relations between actors is a key factor in understanding patterns of human-environment interactions and associated environmental problems (Mostafanezhad et al., 2016). This theory is founded upon a broad radical perspective by neo-marxist and post-marxist theories.

The main arguments of political ecology are stated by Peet et al. (2010:24) as that;

- i) Environmental problems in developing countries are a combination of various economic and political factors that are associated with capitalism.
- ii) The dependency relationship of developing countries on developed countries contributes to environmental crises.
- iii) Main countries (developed countries) causing environmental problems are often put in charge of proposing environmental solutions.
- iv) Environmental problems are complex and deep-rooted therefore technical solutions are not efficient.
- v) Decision making by local actors is crucial for sustainable development.

This theory also emphasises the need to understand the role that power plays in conditioning patterns of human-environment interaction, in order to get a fuller understanding of power. Shiva (2016) states that powerful actors may derive their power from the ability to control the environmental resources of weaker grassroots actors.

Control over access is linked to marginalisation of weaker grassroots actors who are left exposed to changes in the environment such as drought, disasters and deforestation (Keucheyan, 2016). This may also be linked to highly unequal distribution of costs and benefits associated with emerging environmental problems. Weak actors such as the poor, more particularly women who are faced by impacts and rarely receive any benefits (Keucheyan, 2016). Exclusion or limited to no access may leave them with few possibilities to escape their dependent circumstances while further being subjected to poverty (Sandberg et al., 2014).

Political ecology further goes on to criticise the cultural ecology theory by arguing against its emphasis on the environmental problems arising from the ways in which people adapt to the environment without attending to the structures of inequality that exist among humans (Snajdr, 2011). It argues that this cannot be overlooked since it directly affects ways in which people use the natural landscape (Snajdr, 2011). Political ecology has been criticised and seen as a less coherent theory that draws its arguments from a range of theories such as Neo-Marxist and-Neo classical economics (Perrault et al, 2015).

This study applied the political ecology approach in order to show that politics and power has great influence on how resources are accessed and distributed among varied classes of people. This approach was also used to show the variation of cultural values between key informants who in this case are depicted as powerful actors and the communities who are represented as weak actors in this context.

3.5. CONCLUSION

In contemporary participatory conservation schemes, is the involvement of various actors ranging from international, national and local people with the popular idea of conserving and

protecting nature by not compromising the livelihoods of local communities. However conflict of interests within actors are likely to occur hence each is likely to promote interests in its own favour.

It has been heavily documented that power hierarchies and political supremacy among the actors in relation to externally sponsored projects in developing countries exist. Development practitioners are likely to be in control while ignoring local values. This tends to be associated to their financial competence and knowledge. Along with this, primary goals of conservation are compromised while the values and interests of the local people are neglected as well.

CHAPTER 4

METHODOLOGICAL APPROACH

4.1. INTRODUCTION

This chapter presents the methodological approach used in this study. This chapter is divided into following sections: description of the study site, research methodology, data collection methods, sampling procedure, data collection instruments as well as data analysis. The research methodology that was used in this study is triangulation approach, which is a combination of multiple data collection strategies or data sources. Triangulation is regarded as a strategy that enhances the validity and legitimisation of the results as it uses more than one data source (Ahmed et al., 2016). Thus, leading to a more enriched explanation of research problems (Ahmed et al., 2016).

This study employed both qualitative and quantitative research methodology. The choice for this particular approach was motivated by that, CES primarily rely on human perceptions as well as the challenge when integrating this approach into spatial analysis approaches (Daniel et al., 2012). Geographic Information System (GIS) is an approach that enables the integration of spatial, quantitative and qualitative data. Therefore, this study used GIS to identify relationships between the identified communities and their natural landscape.

Qualitative and quantitative research methodology were used as data collection approaches for this study. Data acquired was analysed using the ArcGIS desktop advanced software version 10.3, Google earth desktop version 7.3, Excel workbook 2016 and the Statistical Package for Social Science (SPSS) version 24. Each approach is briefly described in the following sections below to show its relevance to the study.

4.2. STUDY SITE DESCRIPTION

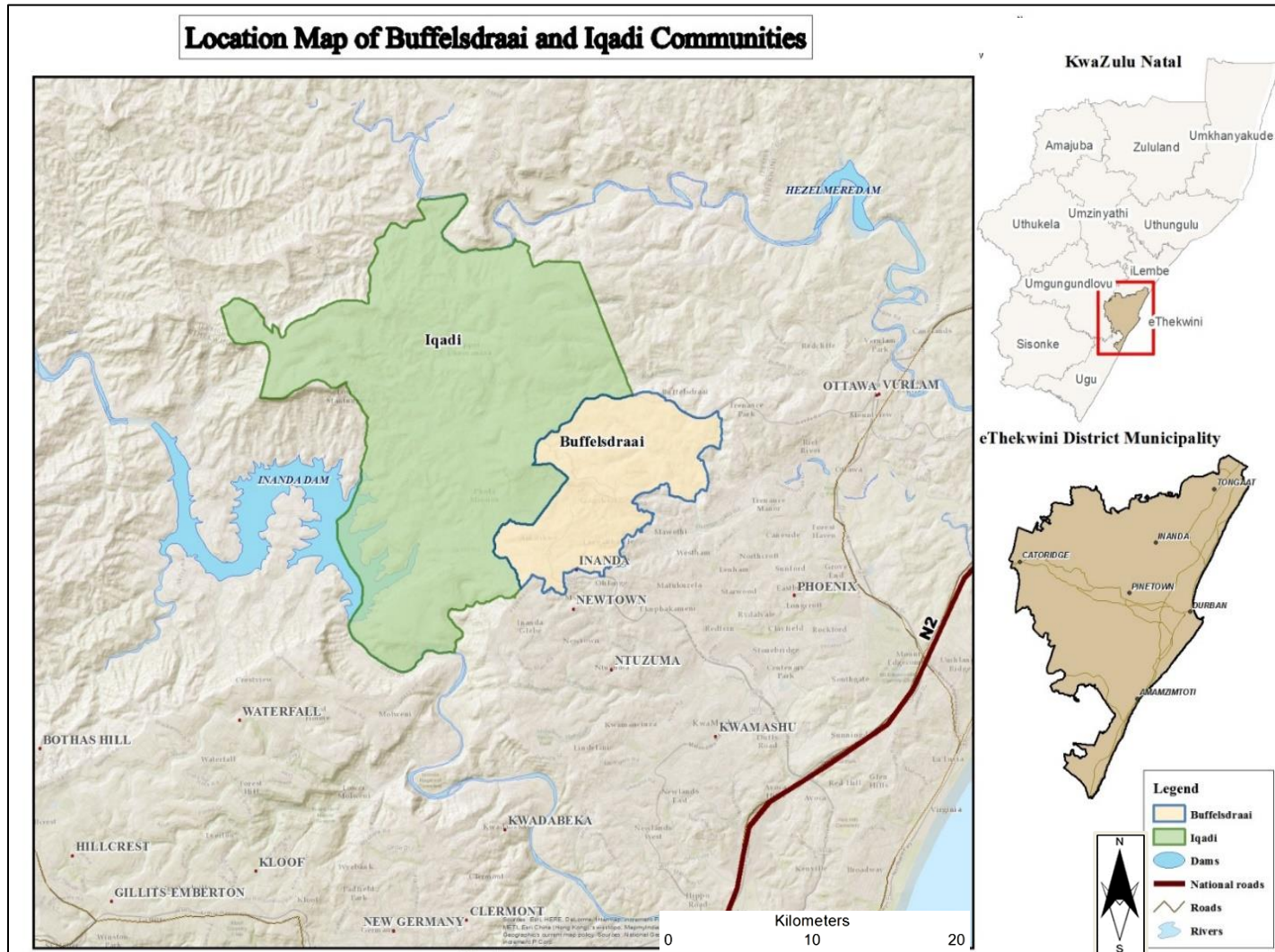


Figure 4.1: Location map of the Buffelsdraai and Iqadi communities in eThekweni Municipality, KwaZulu-Natal

4.2.1. Buffelsdraai

Buffelsdraai is a rural town situated 50 km away north of Durban in the province of KwaZulu-Natal in South Africa. It consists of 1 400 houses and is considered as one of the most populated areas in Durban (Statistics South Africa StatsSA, 2013). Buffelsdraai is characterised by high levels of poverty and service delivery, because of its rural mountainous location. Almost 800 in 1 400 houses are female-headed households (Integrated Development Plan, IDP 2017/2018). The area consists of the largest solid waste landfill that is managed by eThekweni Municipality. The

Landfill has a buffer zone that is 1 km wide to ensure that nearby communities, such as Buffellsdraai and Osindisweni are shielded from the impacts of the landfill (IDP 2017/2018). The site has been previously used for sugar cane planting. However the Municipality in agreement with the Wildlands Conservation Trust (WCT) came to an agreement to restore it using indigenous trees. Thus, WCT was appointed and is responsible for the tree planting and growing operations, undertaken by members of the neighbouring communities. The Buffellsdraai community reforestation project, was selected as one of the top 10 global projects as part of the United Nations Momentum for Change (UNMFC) programme in 2011(IDP 2017/2018). In 2016, the project received a gold standard validation certificate from the Climate, Community and Biodiversity Alliance (CCBA) for benefits to local communities, biodiversity, and ensuring climate change adaptation benefits (IDP 2017/2018).



Plate 4.1: The Buffellsdraai landfill site in eThekweni Municipality, KwaZulu-Natal

4.2.2 Iqadi

Iqadi, which is a village is located in a scenic hilly area known as the Valley of a Thousand Hills approximately 50 km from the city of Durban. It is a rural area characterised by a dispersed settlement pattern (IDP 2017/2018). The Inanda dam to the south borders Iqadi while the Inanda

Mountain is on the north of the village. A local community representative council and a traditional leader control Iqadi community. The population of Iqadi is estimated at over 350 homesteads (StatsSA, 2013). Subsistence agriculture, small scale informal economic activities are the main economic activities in the area (IDP 2017/2018).

The Inanda community reforestation project was initiated by the eThekweni Municipality along with Wildlands Conservation Trust (WCT) in 2009. Iqadi community is a beneficiary of the Inanda Mountain Community Reforestation Project (IMCRP). It is situated on the north of Inanda dam. The entire project is located within community owned land of Iqadi and Maphephethweni along with the Ingonyama Trust Board (ITB).

The IMCRP actively involves people from surrounding communities, who are employed to carry out a variety of tasks. Local community members are restoring more than 300 hectares of the coastal scarp forest, as well as approximately 200 hectares of the KZN Sandstone Sourveld grassland on top of the Inanda Mountain (eThekweni Municipality, 2011). These areas were previously degraded through infestations by invasive alien plants, uncontrolled grazing and fires as well as high levels of wild product harvesting. Buffelsdraai and Iqadi Iqadi communities were chosen for this study due to the two reforestation projects that are taking place within their jurisdiction.

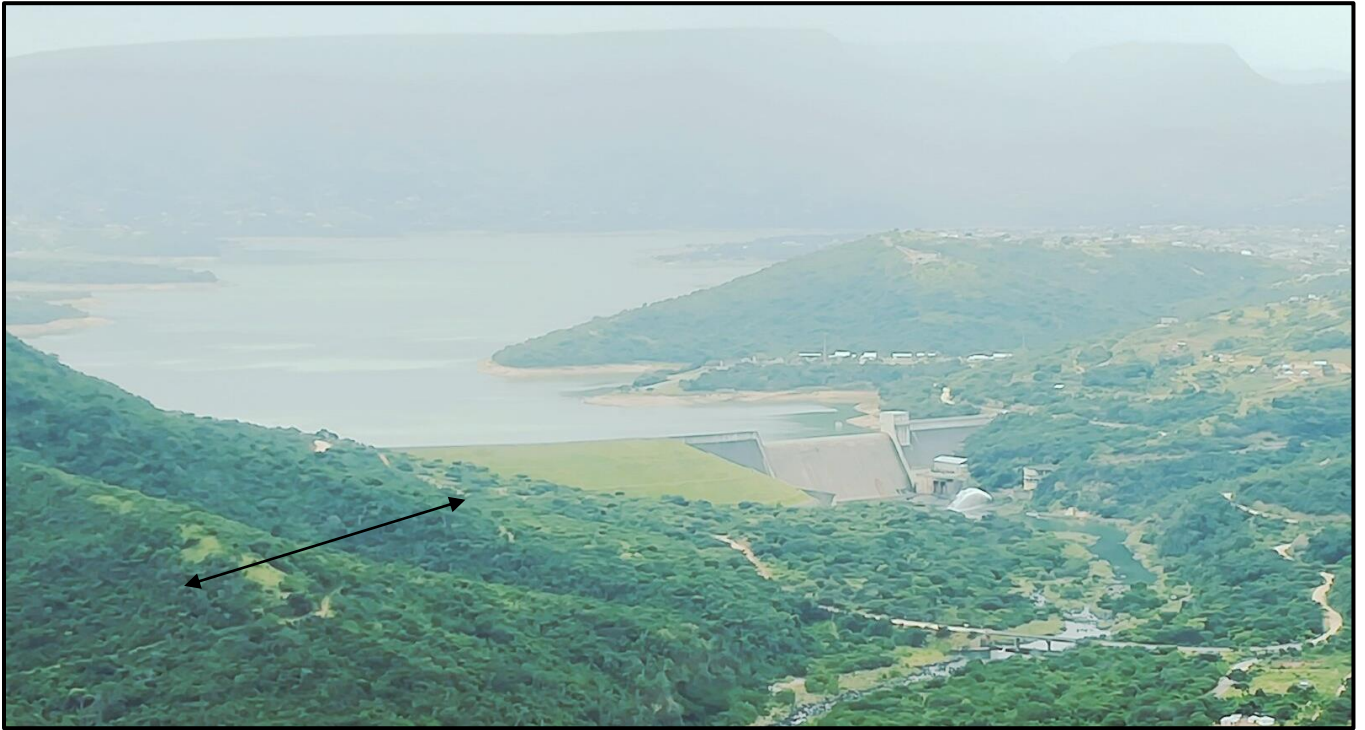


Plate 4.2: Inanda mountain escarpment in eThekweni Municipality, KwaZulu-Natal where the Inanda forest community reforestation project adjacent to Iqadi community is taking place

4.3. RESEARCH METHODOLOGY

4.3.1. Qualitative research methodology

Qualitative research approach is the type of methodology that investigates people’s everyday life experiences, perspectives and thoughts (Patton, 2014). Qualitative research primarily focuses on the natural setting, attempting to make sense of, or interpret, phenomena in terms of the meanings people bring to them (Denzin and Lincoln, 2011). The aim of qualitative analysis is to provide complete detailed description therefore data is primarily in the form of words such as conducting interviews and pictures or objects are used to convey meaning of the data collected (King and Horrocks, 2010). However qualitative data is criticised of being time consuming since it requires thematic interpretation of the gathered data. Also it is less able to be generalised (Perrin, 2014). Qualitative methods used in this study included the PRA exercises such as the participatory mapping exercise, Venn diagram and transect walks that were undertaken within focus group discussions in Buffellsdraai and Iqadi.

4.3.2 Quantitative research methodology

Quantitative research approach deals with numbers or data that can be measured (Grbich, 2013). It is used to quantify the problem by way of generating numerical data or data that can be transformed into useable statistics and later generalise results from a larger sample population (Walter and Andersen, 2013).

In quantitative research, phenomena is explained using statistical models and data can only be gathered through the use of tools such as the questionnaires. However although quantitative data is more efficient and provides accurate results, it is criticised of being too objective and missing contextual data thus challenging to interpret (Maruster, 2013). The quantitative research method was applied through the use of the structured questionnaire survey for both the local community and key informants of Buffellsdraai and Iqadi in this study.

4.4. DATA COLLECTION

Data collection is one important stage of any research. It is crucial for gathering and preparing information relevant for the study (Miles et al., 2014). With appropriate sources of data, a researcher is able to capture, complete and an accurate picture of an area of interest. This enables one to answer posed research questions (Olsen, 2011). This particular study used a combination of both primary and secondary sources to gather information on cultural ecosystem services in Buffellsdraai and Iqadi communities.

4.4.1. Research ethical clearance

Ethics is defined as the rule of conduct of carrying out research (Miller et al., 2012). Research ethics is usually considered as an important requirement for access to participants of a study. It is usually required in research that includes human and animal participants as well as the use of human products by participants (Miller et al., 2012). Research ethics is generally meant to protect those who take part in research. This is by taking into consideration key ethical issues such as getting consent from participants to be involved in research, informing participants of their right to refuse to take part in research, the right to withdraw from research at any given time

should they wish so (Iphofen and Tolich, 2018). The researcher should also ensure that the participant's confidential information is protected and kept in safety.

In order for the researcher to be ethically cleared, ethical clearance application is submitted and it undergoes scrutiny by the ethics committee. The ethics committee usually requires information such as the background to and rationale for the particular study, nature of data to be collected, data collection procedure and instruments, who the participants are and how the data will be stored and for how long it will be stored (Iphofen and Tolich, 2018). The researcher must wait for the approval from the ethics committee before data collection proceeds.

Since this study involves human participants, the ethical clearance form (refer to appendix 5) along with the community and key informant questionnaires (refer to appendix 1 and 2), informed consent forms (refer to appendix 3), and photo and video consent forms (refer to appendix 4) written in both Isizulu and English was submitted to the University of KwaZulu-Natal ethics committee on the 25th of July 2015. On the 15th of January 2016, the ethical clearance was deferred and minor revisions had to be made on the first application. After the amendments, the second ethical clearance application was resubmitted to the ethics committee. Approval to commence with data collection was granted to the researcher on the 2nd February 2016.

4.4.2. Primary data sources

Primary data source refers to the type of data that is collected by the researcher directly from the selected sample for a specific purpose (Miller et al., 2012). Primary data sources used for this study included a structured questionnaire and PRA exercises.

4.4.3. Secondary data sources

Secondary data is information that is already available somewhere (Miles, 2014). Secondary data sources are usually used in the early stages of research for some background on the topic under

investigation. This information is also useful for a researcher to gain insights on studies that have been done on the similar topic before (Olsen, 2011). Dissertations, reports, census data, journal articles such as peer reviewed and grey literature, book chapters, books, online books, conference papers and web pages were used as secondary data sources for this study. Peer reviewed journal articles and online books were obtained from Scopus, web of science, science direct and Ebscohost search. Reports, book chapters and conference papers were obtained from Google scholar while dissertations were retrieved through research space.

4.5. SAMPLING PROCEDURE

Sampling is defined as the process of selecting particular participants suitable for the study from a large population (Thompson, 2011). These selected units represent a sampling frame which is the list of all the units of the population of interest. Once a sampling frame is known, the researcher needs to adopt a sampling technique to extract information from the selected sample. Participants for this study were drawn from both women and men in Buffellsdraai and Iqadi communities.

4.5.1. Participants sampling technique

A hundred households in each community were drawn using the systematic random sampling technique. The sample size of 100 was chosen to allow for a more homogenous group since the study is about perceptions regarding the values of various categories of CES in Buffelldraai and Iqadi communities. Systematic random sampling is defined as a probability technique, where participants are selected starting from a random point and a fixed interval such as the first participant is selected randomly and the remaining participants are selected automatically according to a predetermined pattern (Martino and Miguez, 2018). This technique ensures that each participant has equal probability of inclusion in the sample (Thompson, 2011). For the purpose of this study, systematic random sampling technique was chosen reason being that both communities are characterised by a dispersed settlement pattern. Houses in both communities are scattered over a wide area and are found in hilly areas. Hence, every fourteenth household was sampled in the Buffellsdraai community because the area consists of approximately 1400 households. While every fourth household was sampled in Iqadi because the area consists of

approximately 350 households. This strategy was to allow the researcher to have a bigger representation of the communities.

4.5.2. Key informants sampling technique

Snowball sampling was employed to select five key informants for this study in each community respectively. Snowball sampling is when the first person is selected based on their knowledge of a particular phenomenon. It then that person who refers one to other people who possess the same knowledge (Daniel, 2012). Key informants consisted of the project co-ordinator for both projects who is a representative from eThekweni municipality, five WCT members who are also community members, two councillors and two chiefs from both communities. Key informants were selected because of their knowledge of the reforestation projects. They were identified during the preliminary phase of the study when access to the communities' understudy was required.

4.5.3. Focus group recruitment strategy

Purposive sampling was used in both communities to gather participants for the focus groups. Posters explaining the main components of the project, details of the focus group discussion such as the logistics, time, date and the venue were distributed in public spaces such as bus stops, taxi ranks, local supermarkets, tuck shops, spaza shops and clinics in Buffelsdraai and Iqadi communities respectively. The communities were notified two weeks prior to the focus groups respectively. Posters enabled the researcher to reach out to members of Buffelsdraai and Iqadi communities with similar interests. Posters were chosen for this study because they are regarded as a cheap and feasible recruitment strategy in which information can be portrayed to reach interested participants (Ostberg, 2018). Posters played an important role in recruiting a reliable sample for focus group discussion as participants had volunteered to be part of the study. One key informant from Buffelsdraai also assisted the researcher with recruiting participants for focus groups through word of mouth.

4.6. RESEARCH INSTRUMENTS

PRA exercises such as the participatory mapping exercise, the Venn diagram and transect walks as well as a structured questionnaire survey were used as research instruments to aid in collecting

data for this study. Consent forms were issued to participants from both communities before the interviews in order to ensure their willingness to participate in the study.

- **Consent forms**

An informed consent is described as a communication process between the researcher and the participant (Pfenneinger and Fowler, 2010). This communication starts before the research is initiated and it continues throughout the duration of the study. Consent forms provide all relevant information to the participants, to make sure that the volunteer understands the nature of the study and agrees to participate (Sterling, 2015). Consent forms also allows participants to determine whether participating in research fits with their values and interests as well as to decide whether they can fulfill the requirements necessary for the research (Thompson, 2011).

4.7.1. Participatory Rural Appraisal

PRA was used in this study as the main approach to gather qualitative data. PRA is a social science approach to data collection that grew out of rural development work in the 1970's (Bowd and Ozerdem, 2013). PRA was mainly developed in response to the perceived problems of researchers missing information about local people in the context of development. In PRA, data collection and analysis are undertaken by local people, with the researcher's role becoming that of facilitator rather than taking charge of research (Ginty, 2017). PRA involves the direct participation of locals (Laverack, 2014). The locals themselves become the main investigators and analysts in research. PRA uses various tools to both gather and analyse information. PRA encourage participation of all actors, it makes it easy for research participants to express their views (Plummer and Taylor, 2013). PRA consists of a mix of visual models and direct observations. PRA exercises that were undertaken in this study were participatory mapping exercises and the Venn diagrams which were carried out during focus groups as well as transect walks.

4.6.2. Focus group discussion

Focus group refers to various groups in terms of composition, size and purpose. Focus groups are intended to understand how people think or feel about a particular issue. It is a way in which a researcher can obtain perceptions on a defined topic (Engelsen et al., 2012). Participants in a

focus group are selected because of certain characteristics that are common in relation to the topic studied (Miles, 2014). Each group is conducted through a series of discussions with a minimum of five people and a maximum of ten people (Miles, 2014).

Focus groups for this study consisted of participants who had been interviewed during the administering of the questionnaire survey while other participants were there for the first time. The reason for using a different research instrument to obtain data to the same category of people was because questionnaires that were administered had a set type of questions that guided and probed participants of their own cultural values as individuals while the focus group enabled participants to share cultural values and views as a community. Because although one might belong to a certain culture that is attributed to a certain belief system but their own beliefs might be influenced by personal experiences thus different from the whole group.

Focus group discussions from both communities were conducted separately on different dates. One focus group discussion was conducted for each community. Each focus group was divided into 5 sessions in relation to the categories of CES. Focus group discussions for Buffellsdraai community took place in the Buffellsdraai reforestation education centre. While the focus groups for Iqadi community were carried out in the Iqadi community hall. A bus organised by key informants from each community was responsible for collecting participants from the local bus stops. The bus then transported participants to and from community halls in both communities respectively.

During focus group discussions in both communities, participants were divided into groups of 10 according to their gender and age categories. This was done to capture age and gender differences regarding perceptions concerning the uses of CES in Buffellsdraai and Iqadi communities. Sixty minutes was given to participants to discuss and list the uses of CES among their respective groups. After the discussion, participants were given the opportunity to list all the identified uses of CES on the A3 sized paper. To enhance the results of the study participants were asked to reflect on the importance of CES in their daily lives.



Plate 4.3: Buffellsdraai participants getting ready to be divided into groups for the focus group discussion

4.6.2.1. Participatory mapping exercise

Participatory mapping is a form of sketch mapping that represents the spatial knowledge of local communities. It often represents a socially or culturally distinct understanding of landscape by the locals (Mitchell, 2002; Plantin, 2014;). These maps are created by local communities to show the place in which they live, and the elements that communities themselves perceive as important such as land, resources, livelihood, and sacred areas (Kent and Vujakovic, 2017)). Participatory maps aid in understanding connections between people and or places over space and time. In this study, participatory mapping was undertaken in the context of focus groups in each community. Each group was provided with an A3 white poster paper, map of the area, a variety of colouring pens to show different CES chosen, paper pins and bostik.

Participants were given instructions as to use the provided map to place paper pins on areas they regard as culturally important, they were further told to use the same colour for each category of CES so that it is easy for the researcher to analyse the results and later present as to why they

feel that these areas should be protected. These maps were then scanned and georeferenced on Arc map where the map of the area with the actual spatial locations existed. Georeferencing refers to overlaying a map containing raw collected data to the map that already has a spatial reference. The points on maps to which participants had been asked to assign different colours representing each category of CES as defined by the MEA were then given spatial location (x and y co-ordinates) on the Google earth program by pinpointing each and every single one of them while saving them under the identified category of CES. This was done for points identified in both communities. Points were then saved as shapefiles and later transferred to arc map where they were overlaid with other layers to provide a visual representation of CES found in Buffelsdraai and Iqadi. Supplementary layers were obtained from the cartography unit in the geography department, Pietermaritzburg campus.

4.6.2.2. Venn diagrams

Venn diagrams refer to the visual subsets of a set, that represents how particular subsets interact or overlap (Mamakani, 2013; Cipra, 2015). Venn diagrams are primarily used to specify constraints and relationships among sets. In the past, Venn diagrams were presented with three curves intersecting one another. The diagram seemed to be cluttered when four or more curves were used, resulting in the diagram being difficult to draw and read. In a study done by Verroust and Viaud (2004) indicated that more than three curves can be represented using elliptic shapes to allow for the diagram to be more readable. This study employed the Venn diagram to illustrate the relationship between various power institutions in the decision-making process relating to the natural environment. Each group during the discussion was presented with an A3 white poster paper and drawing pens to illustrate a hierarchical relationship in their respective communities (Mitchell, 2002). Various groups presented multiple Venn diagrams from both communities. Similar hierarchical relationships were observed among groups. The researcher then decided to ask participants to collectively contribute to drawing one main Venn diagram representing power relationships in their community. This strategy was applied during the focus group discussion in each community.

4.6.2.3. Transect walks

Transect walks is a group walk initiated to observe and study the phenomenon in question (Duncan, 2017). It is systematic walk in an area along with the key informants which helps gain

a more detailed understanding of the area (Mamakani, 2013). Transect walks in this study provided a researcher with the opportunity to cover some aspects of the study that were missed in the questionnaire survey. Through transect walks the researcher was able to observe the actual location and distribution of cultural ecosystem services in Buffellsdraai and Iqadi with the help of six local people (three from each community). These locals were selected by participants during the focus groups due to their in-depth historical knowledge of the area and the knowledge of the environment. Four of the participants were well known traditional healers. Each point (x and y coordinates) identified was recorded through a Global Position System (GPS).

4.6.2.4. The structured questionnaire

Two structured questionnaire surveys were carried out in this study; this included the community questionnaire (refer to appendix 1) and the key informant's questionnaire (refer to appendix 2). A total of 200 community questionnaires consisting of sixty closed and open ended questions were prepared and administered in IsiZulu and in English to one hundred households from each community in Buffellsdraai and Iqadi, respectively. Ten key informant questionnaires that consisted of seventeen questions were administered to five participants in each community. Key informants are those that are regarded as having professional or specialist knowledge about communities (Pierce, 2014). Key informants are either people who may be working with the community or members of the target market (Sapri, 2013).

The ten key informants were included in this study due to their involvement in the eThekweni reforestation project. Five key informants from Buffellsdraai and Iqadi, respectively were interviewed as part of the study. This was done through face-to-face interactions, which allowed for a researcher to explore the responses of participants and gather in-depth information, by observing the behaviour of participants and probing for answers (Szolnoki, 2013). Open ended questions allowed for the flow of conversation beyond the questions asked whereas closed ended questions required fixed answers like yes or no. Questionnaires were administered in both IsiZulu and English, each with a consent form attached as the cover page. The structured questionnaire was selected because it gives the researcher an opportunity to interact directly with participants through talking, listening and gaining access to their views and opinions (Saris et al., 2014). The interaction and privacy creates a comfortable environment for an interviewee to share

truthful information (Rossi et al., 2013). Those who could not read and write were assisted by the researcher.

4.7. DATA ANALYSIS

Data analysis is a final stage of research where the researcher prepares and separate collected data with an aim of discovering useful information that will be used as recommendations and conclusions for the study (McCormick and Salcedo, 2017). Data for this study was analysed using quantitative and qualitative data analysis techniques. Quantitative data, (the structured questionnaire survey) was analysed using the Statistical Package for Social Sciences (SPSS) version 24. Variables that were analysed in SPSS included socio-economic characteristics of participants such as gender and occupation for Buffellsdraai and Iqadi participants respectively, the relationship between gender and occupation for Buffellsdraai and Iqadi participants, responses of participants from Buffellsdraai and Iqadi community concerning the community reforestation projects, the perceived location of Buffellsdraai and Iqadi participants away from the project site, the frequency of perceived CES from Buffellsdraai and Iqadi, key informant responses relating to their place of residence, key informant responses in relation to the cultural use of landscape of communities as well as key informant responses with regards to the number of years working within the project communities.

However the questionnaire was constructed with both open and closed ended questions, closed-ended questions were analysed using descriptive statistical methods to create tables, pie charts and graphs. While open-ended questions and data generated from participatory methods were analysed using thematic analysis. Thematic analysis refers to the identifying, organising and presenting data into themes (Mills et al., 2016). Thematic data is presented in tables and graphs in the discussion and conclusion chapters of this study.

The GIS was used as the main tool to convert information gathered from the participatory mapping exercise to spatial data in order to account for the distribution of perceived cultural ecosystem services in Buffellsdraai and Iqadi communities respectively. Global Positioning System (GPS) coordinates collected during transect walks in both communities were added to a table in excel workbook 2016, the table had two fields, one for x coordinates known as the

latitude and the other for y coordinates known as the longitude. Latitude and longitude coordinates were then saved as a tab delimited file so that it is compatible for the ArcGIS desktop advanced software version 10.3. ArcGIS and Google earth software were used to create a series of maps that accounted for the spatial heterogeneity of CES in Buffelsdraai and Iqadi was created.

4.7.1. GPS

The GPS is a navigation system that was developed by the United States department of defence (Leick, 2015). The GPS system is made up of three parts: the space segment, control segment, and user segment. The space segment consists of the constellation of up to twenty four active satellites (Luo, 2013). The control segment consists of numerous ground stations that serve as uplinks to the satellites and that make adjustments to satellite orbits and clocks when necessary (Helms, 2011). The user segment is the GPS receiver. Triangulation is used to combine distances with the location of the satellites to determine the receiver's location (Grubbs, 2013). The receiver's GPS triangulates its own position by getting bearings from three of the four satellites. The result is provided in the form of a geographic position known as longitude and latitude (Francis, 2013). The GPS in this study was used to determine geographic locations of landcovers during transect walks. The GPS was chosen for this study because it is portable, cheap, and less costly as well as keeps data that can be accessed and retrieved later.

4.7.2. ArcGIS

ArcGIS is a GIS software that was first developed by ESRI in 1999 and it consists of two main applications. Arc GIS is used to create maps, analyse mapped data, use maps and mapped data in various applications (Plantin, 2014). Through ArcGIS the user can either use Arcmap which allows for map display and query maps, create quality hardcopy maps and perform many spatial analysis tasks (Brown and Harder, 2016). ArcMap provides an easy transition from viewing a map to editing its spatial features (Mc Ginty, 2016). The user can also use arc catalog which allows the user to easily access and manage geographic data that is stored in folders on local disks or other databases that are available on the user network (Brown and Harder, 2017). Data can be copied, moved, deleted, and quickly viewed before it is added to a map. In addition, metadata can be either read or created using this ArcGIS application (Holdstock,2016).

4.7.2.1. Kernel density analysis

Kernel density is a spatial analysis method that is commonly used for hotspot identification (Thakali et al., 2015). Kernel density analysis calculates a magnitude per unit area from point or line features using a kernel function, it calculates the number of points within a single raster cell and divides this by the neighbourhood area (Silverman, 2018). For this study, the kernel point density analysis was applied for CES points gathered in Buffelsdraai and Iqadi communities to identify areas that have more CES points than others as well as to establish if there is a relationship between CES values and various landcovers. The population field was specified as none since none of the CES identified had more weight than the other. In this regard, all CES were treated equally important depending on participants individual values.

In order to distinguish hot and cold spots, this study categorised ranges (none, very very low, very low and low) as low concentration and (medium, moderate, high and very high) as high concentration of CES points. Low concentration of CES points refers to cold spots while high concentration refers to hot spots in this study.

4.7.3. Google earth software

Google Earth is a virtual globe program that maps the earth by the superimposition of images obtained from satellite imagery, aerial photography and GIS 3D globe (Miles, 2014). Google Earth combines satellite imagery, maps and the power of Google Search to view the world's geographic information (Saris et al., 2014). Google earth in this study was used to give spatial reference to the perceived CES that were identified by participants during the mapping exercise.

4.8. FIELD WORK EXPERIENCES

4.8.1. Buffelsdraai community

A preliminary site visit for Buffelsdraai took place in June 2015 to obtain permission from the councillor to conduct research in the area. However due to political issues that were taking place in the area during that period the councillor was unavailable. For this reason, the research coordinator for the Durban Research Action Partnership (DRAP) which this research falls under organised a meeting with the eThekweni Municipal manager who was the person who granted permission for this study to be conducted in Buffelsdraai in March 2016.

4.8.2. Iqadi community

Preliminary site visit Iqadi took place in April 2016. The researcher had to inform both the councillor and the chief from Iqadi local community about the research and had to obtain permission to conduct research in the area along with two field assistants appointed by DRAP.

After obtaining permission the researcher and two field assistants travelled from Pietermaritzburg to Durban daily to reach both study areas. Most participants in both study areas were fluent in isiZulu, therefore questionnaires translated into isiZulu language were handed out to them. Some participants were not able to read and write. As a result the researcher had to read the questions to them. Though a majority of participants were willing to participate in this study, some felt that the questionnaire was too lengthy. Some were reluctant to answer some questions because they thought the researcher worked for the eThekweni Municipality. Participants told the researcher they fear to lose their jobs and to be evacuated from the area if they answer some questions from the questionnaire. Participants from both communities were leading in discussions during participatory exercises. However the researcher noticed that they had a limited knowledge of the map. The researcher along with research assistants had to assist them during the mapping exercise. Overall, participants were welcoming and excited that the researcher had reached out to them. They told the researcher that they thought they were forgotten and hope this research allows for their opinions and perceptions to be known. In addition, the researcher had an opportunity to interview key informants who provided more insight concerning CES within the communities.

4.9. CONCLUSION

This chapter has discussed how data collection and analysis for this research was undertaken. Research methodologies, instruments and the analysis procedure used in this study were discussed. Furthermore, fieldwork experiences were discussed. Through these, the researcher was able to investigate and address the proposed objectives and research questions for this research.

CHAPTER 5

DATA ANALYSIS AND DISCUSSION

5.1. INTRODUCTION

This chapter comprises of data analysis and discussion of the findings. This chapter discusses the main findings from the questionnaires and focus group discussions from Buffellsdraai and Iqadi communities in relation to the objectives of the study, conceptual framework and the literature that was previously reviewed. It also aims to determine the extent to which the findings have contributed to the research and to addressing the objectives of this study. This chapter will also provide conclusion and recommendations of the study.

5.2. THE SOCIO-ECONOMIC CHARACTERISTICS OF THE LOCAL COMMUNITY PARTICIPANTS FROM BUFFELSDRAAI AND IQADI COMMUNITIES

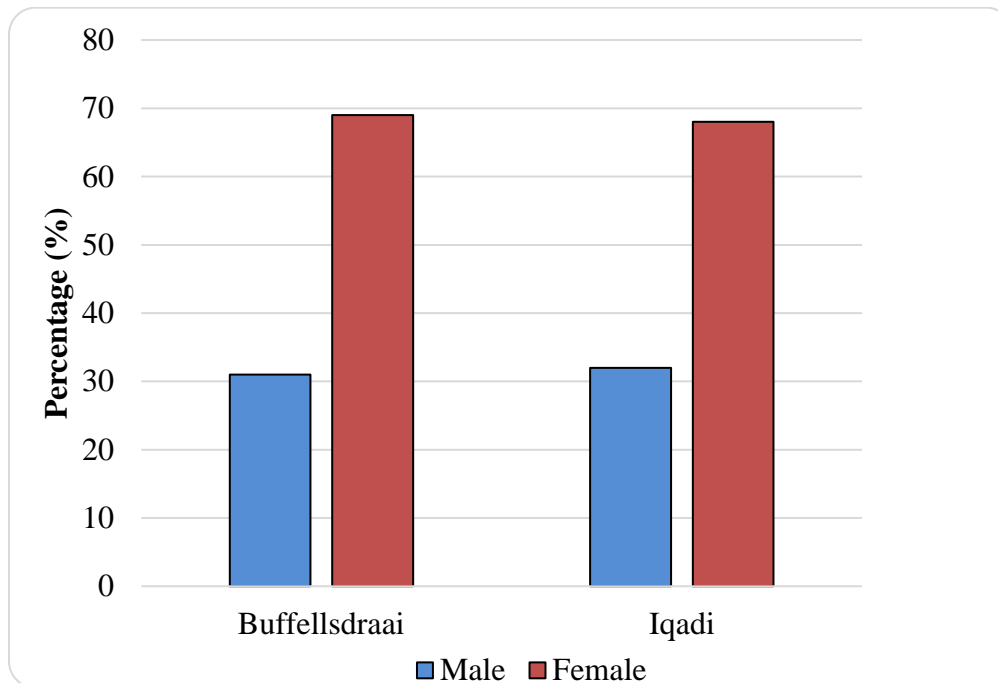


Figure 5.1: Displays the gender of Buffelsdraai and Iqadi participants

Figure 5.1. shows that there were more female participants in Buffelsdraai and Iqadi than their male counterparts. Out of hundred participants in Buffelsdraai , 69% were female and 31% were male. In Iqadi 68% of the participants were female and only 32% were male. The overall results show that out of 200 participants of the study, 137 were female while only 63 were male. It was observed that in most households males are the ones who migrate to urban centres. This result is supported by Deininger et al. (2008) state that households with female headships are mainly due to the absence of men as a result of migration and death. However a common pattern characterising the absence of men in developing countries is that they leave their wives and children in the place of origin in search of employment (Jegerson et al., 2010). This greatly increases women's work roles as they are left to take care of the home and children (Majali, 2012).

However participants from Iqadi stated that this enables the families who have siblings who work in the urban centres to have enough money to sustain them without depending solely on agriculture. The women who have not migrated stay at home and look after the family and they are responsible for the household chores like cleaning, collecting fire wood and cooking. The researcher also observed that some households in the Buffellsdraai and Iqadi are headed by female children because both parents have migrated to the city to earn a living. In such cases the children are the ones who care for the day to day household chores (refer to plate 5.1 below). This is supported by the United Nations International Children's Emergency Fund UNICEF (2016) report that states that girls spend more than half of their time a day on household chores such as cooking, cleaning, collecting firewood and caring for family members than boys. Another report by StatsSA (2017), shows that approximately 9 million female children are involved in household chores, with the province of KwaZulu-Natal reporting the highest percentage. Hindman and Hindman (2014) argue that the absence of parents at home also lead to child labour. African children are more likely to be involved in child labour when compared to other population groups (StatsSA, 2015).



Plate 5:1: Female children waiting to collect water from the nearby river for human consumption

Table 5.1: The relationship between gender and occupation for Buffellsdraai and Iqadi participants

Occupation	Buffellsdraai (n=100)		Iqadi(n=100)		Total(n=200)	Percentage (%)	
	Female	Male	Female	Male		Female	Male
Unemployed	30	5	32	10	77	31%	7.5%
Domestic labour	16	0	14	1	31	15%	0.5%
Gardener	2	10	1	13	26	1.5%	11.5%
Professional	3	5	5	2	15	4%	3.5%
Dependent	8	1	14	4	27	11%	2.5%
Reforestation project beneficiary	10	10	3	1	24	6.5%	5.5%

Table 5.1 above shows the gender of participants in relation to occupation in Buffellsdraai and Iqadi, respectively. The researcher observed during the interviews that females headed most households in the two communities. This concurs to the result in Table 5.1 where it is evident that more women 31% compared to men at 7.5% are unemployed. Most men in Buffellsdraai and Iqadi were perceived to either be at work or absent. This result agrees to Bacci (2014) who argues that in most rural areas, households are female headed because of male migration to urban areas for well-paying jobs as a result women are left alone at home to take care of the family and children. Furthermore, Bloch and Dona (2018) argues that male employment is to earn money while the role of a women is look after the home and family. Jacobs and Hart (2012) write that in South Africa particularly, the banning of migration laws that were in place during apartheid has led to the increase of male migration. The reason being that before apartheid people were forced to work within the area in which they are from Malik (2015) also points onto social, cultural and religious norms as factors that usually restrict women's roles. Patriarchy among other things have prevented women from attaining formal employment as it is often believed that women's roles should be within the household. Rahamneh and Habees (2012) states that existing gender relations as a result of patriarchy give a perception that men are breadwinners and women's roles are to compliment male productivity. In this way, stereotypes still contributes to the way men treat women especially in rural areas where women are always discriminated and looked down

upon. However despite the challenges that women face, female headed households have shown to be less poorer than male headed households (Jorgensen et al., 2015).

5.2.1. THE RELATIONSHIP BETWEEN THE LOCAL COMMUNITY AND COMMUNITY REFORESTATION PROJECTS

In order to understand community involvement in the Buffellsdraai or Inanda Mountain community reforestation projects. The extent to which participants are involved in the projects was assessed.

Table 5.2: Responses of participants from Buffellsdraai and Iqadi community concerning the community reforestation projects

Responses	Buffellsdraai(n=100)		Iqadi (n=100)		Total (n=200)	Percentage (%)
	Female	Male	Female	Male		
Yes	50	21	60	17	148	74%
No	19	10	8	15	52	26%

The result in Table 5.2 shows that in overall, 74% of the participants interviewed in the study did know about the community reforestation projects while 26% did not know. In Buffellsdraai particularly, 71 of the participants had an idea of the community reforestation project while only 29 did not know and have never heard of anything about the reforestation project. This is due to participants' involvement or the involvement of their household members in the project. However in Iqadi 77 of the participants knew about the project and the 23 remaining did not have a clue. This result is because although the project is not initially from this particular community, the community is included because of its close proximity to both project communities. However participants raised a concern that they first have to know someone who already has a job in either of the project communities in order for them to be hired. Buffesldraai

and Iqadi respectively, more women in relation to men were knowledgeable about the projects. Shiva (2016b) substantiate this result by arguing that this active involvement of women, is inherently connected to women being more caring and compassionate towards nature than men. Shiva (2016a) states that the closeness of women to the environment is related to the reproductive role of women in society, their ability to reproduce and create life, is similar to the surrounding ecological process to reproduce and create life.

Table 5.3: The perceived location of Buffellsdraai and Iqadi participants away from the project site

Distance from home	Buffellsdraai (n=100)	Iqadi(n=100)	Total(n=200)	Percentage (%)
Within the site	5	0	5	2.5%
1-5 km radius from the site boundary	10	2	12	6%
6-10 km radius from the site boundary	10	7	17	8.5%
11-15 km radius from the site boundary	20	28	48	24%
16-20 km radius from the site boundary	24	20	44	22%
21-30 km radius form the site boundary	31	43	74	37%

Although participants lived within and in close proximity to project sites (within 10 km radius and less) at 17%, they perceived themselves as living far away from the site at which community reforestation projects are taking place (refer to Table 5.3 above). Participants mentioned they do not have a partnership with any of the community projects. Participants from both communities mentioned that they do not receive any benefits from the community projects. Participants further mentioned to the researcher that they have lived in the place for years, but when the project was initiated, they were not consulted. Another anxiety perceived by the participants were that they feared of forcefully being evicted from the site. One male participant

from Buffellsdsraai was quoted saying, “Even if they don’t force us to move now but what about our grandchildren? And I don’t think they will even compensate us with anything though this is our land”. Participants from Buffellsdraai particularly those living within the project area to 1-5 km radius from the site 6% further voiced their greatest dissatisfaction about the project concerning the noise from the landfill site as well as not getting employed when they live within close proximity. These findings show that the communities are unhappy as they are not included in the implementation, execution and decision-making process of the project, which could hinder the success of the projects.

5.2.1.1. Venn diagram results

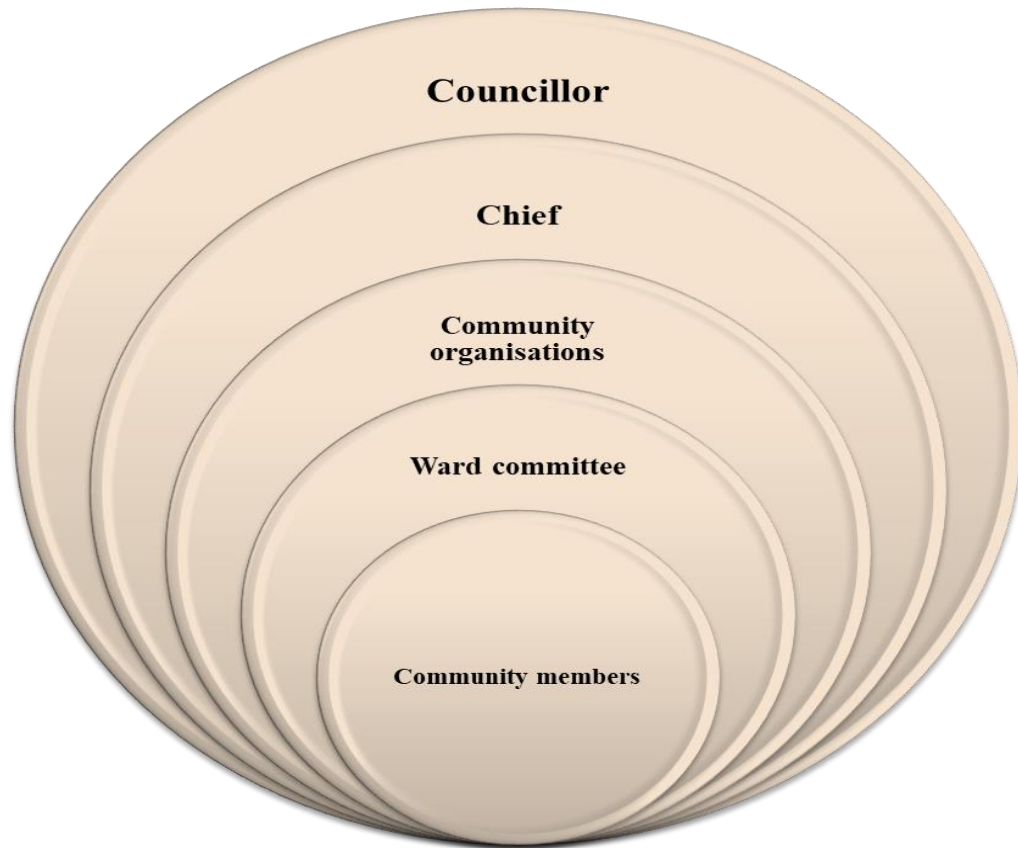


Figure 5.2: Venn diagram that was illustrated by Buffelsdraai participants during the focus group discussion

Buffelsdraai community participants were asked to identify various institutions responsible for environmental decision-making within the community. The connection of circles showed the relationships between community members and decision power within the community. The size of each circle symbolises the level of influence that each institution has in the decision-making process within the community. The Buffelsdraai community is governed by the councillor should any issues arise or decisions needed to be made within the community, the councillor is held responsible. He is the individual who passes down the information to other institutional bodies if the need arises. In his absence the chief who is the second in command takes over. This can also be applied to the implementation of any projects within the borders of the

community. The participants stated that they rarely have contact with the councillor, the chief and the community organisations. Concerns have been communicated to the ward committee who then revert back to the rest of the individuals who hold power in the community.

Participants felt that they were an important stakeholder and dissatisfied with the institutional gate keepers. As the participants perceive that they are an important stakeholder and want to make effective decisions that affect them. For example, the community does not know about the reforestation efforts occurring in the area and only a few of them are project beneficiaries. This confirms the result in Table 5.2 which shows that 29 participants of Buffellsdraai compared to 23 are not aware of the community reforestation projects.

From this research it can be concluded that the nature of relationship between institutions in Buffellsdraai is a dictatorial one, a process that allows professionals to provide leadership and services that support an externally created plan. As a result the locals are unhappy with the services that programs provide and they are not likely to participate in the program effort (Daily, 2012). At the core of any community project locals must be included in discussions to improve opportunities to learn, and the sense of empowerment that comes with knowledge are the necessary precursors to insuring program success (Costanza et al., 2014).

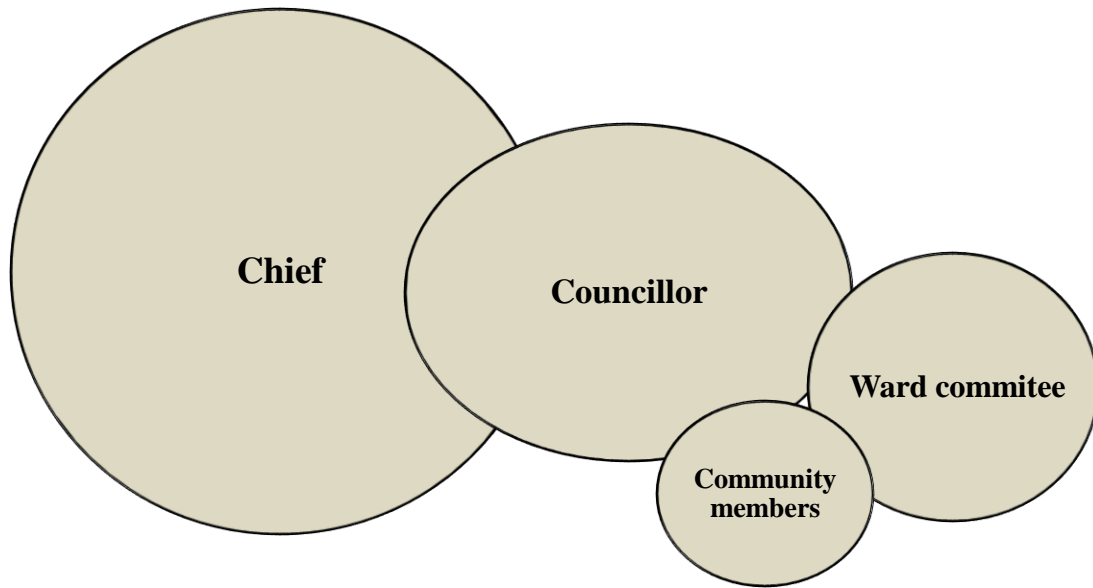


Figure 5.3: A Venn diagram that was illustrated by Iqadi participants during the focus group discussion

A Venn diagram drawn by Iqadi participants showed that in comparison to the Buffellsdraai community, the chief is the main authority governing the community. Participants mentioned that the chief and councillor have an open door policy and usually call the community for meetings where concerns and requests are usually discussed. The governance of the Iqadi community exhibited a more inclusive governance compared to that of the Buffellsdraai community. This confirms the result in Table 5.2 which shows that 77 participants from Iqadi in comparison to 71 participants from Buffellsdraai know about the community reforestation projects.

5.3. LOCAL COMMUNITY'S PERCEPTIONS IN RELATION TO CULTURAL ECOSYSTEM SERVICES PROVIDED BY THE LANDSCAPE

As it is within the context of this research to assess local people's perceptions with regards to cultural ecosystem services in Buffellsdraai and Iqadi, respectively. This section presents responses from which participants were asked to identify various cultural ecosystem services from the maps of their respective communities.

Assessing people's perceptions on cultural ecosystem services in both communities (Buffellsdraai and Iqadi) proved difficult. The use of area maps within interviews was unsuccessful in expressing what the researcher thought were meaningful maps, to identify cultural ecosystem services by participants. This difficulty resulted from most participants being unaware of the manner in which they use their surrounding environment culturally.

It was therefore necessary for the researcher to use the most effective method in order to gain more information. To understand and document these perceptions, it was important to use PRAs, as they allow the locals to play a lead role in matters concerning them. The researcher had to spend time with participants from Buffellsdraai and Iqadi communities in order to learn the manner in which they interact with nature and understand activities that mediate this relationship. Through this method, natural landscapes that have cultural significance were identified.

5.3.1. The frequency of cultural services

Table 5.4: The frequency of perceived CES from of Buffellsdraai and Iqadi

CES Categories	Buffellsdraai (n=100)	Iqadi(n=100)	Total(n=200)
Landscape value	46	30	76
Religious and spiritual value	46	14	60
Recreation and tourism	34	24	58
Cultural heritage	22	29	51
Educational knowledge	15	14	29
Social relations	20	8	28

Two hundred participants, hundred from each community used 302 points to map the perceived cultural services (175 and 127 points, respectively). Landscape values were the most frequently marked service category with 76 points (46 from Buffellsdraai and 30 from Iqadi, respectively). Religious and spiritual values was the second most valued with 60 points (46 from Buffellsdraai and 14 from Iqadi, respectively) and recreation and tourism was third with 58 points (34 from Buffellsdraai and 24 from Iqadi, respectively), followed by cultural heritage with 51 points (22 from Buffellsdraai and 29 from Iqadi, respectively). Educational knowledge values had 29 points (15 from Buffellsdraai and 14 from Iqadi, respectively) and social relations with 28 points (20 from Buffellsdraai and 8 from Iqadi, respectively).

Participants of this study from both Buffellsdraai and Iqadi identified landscape value as the primary cultural value. In the context of this study, landscape value referred to tranquility and beauty of the area as well as experiences relating to sense of belonging and identity. A possible explanation for this might be local people's appreciation of a clean and healthy environment. Religious and spiritual value was ranked second cultural value. This result illustrates that

religious and spiritual values of ecosystems remains just as important to other services for various communities within the developing and developed countries. Lindhjem et al., 2015; Zandersen et al., 2017). De Souza and Halafoff (2017) states that religion as well as spirituality fosters a sense of security and belonging within a community.

5.3.2. The spatial distribution of cultural ecosystem services as perceived by residents of Buffelsdraai and Iqadi

The spatial presentation of phenomenon as to where it occurs and how it relates to another is crucial in the process of spatial planning and makes ES negotiation by stakeholders easy (Pace and Groffman, 2013; Masden, 2018). CES were identified by participants in both areas within Buffelsdraai and Iqadi communities respectively. It was noted that the spatial distribution varies with the different types of CES identified by participants in both communities. It was also prominent in the results that CES are dependent on the presence of the landcovers. Therefore, understanding the relationship between landcovers and CES is crucial for ecosystem health as well as the cultural wellbeing of humans (Sage, 2012).

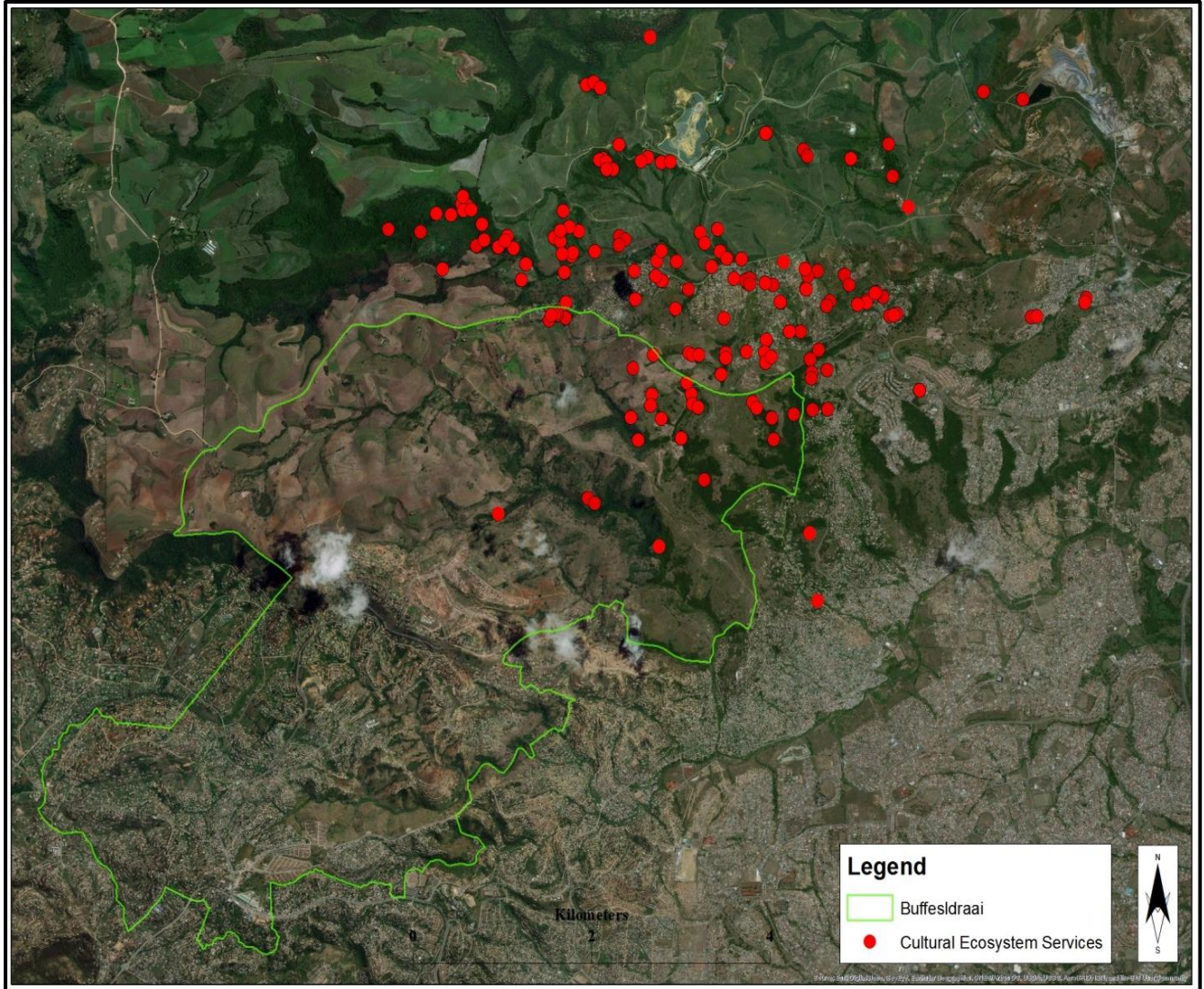


Figure 5.4: The spatial distribution of the perceived CES in Buffelsdraai, eThekweni Municipality, KwaZulu-Natal

Figure 5.4 and 5.5 shows the overall general distribution of the perceived CES in Buffelsdraai and Iqadi. In Buffelsdraai, the red coloured points representing the identified CES can be observed within the Buffelsdraai community boundary as well as on the outside border of the Buffelsdraai community (refer to Figure 5.4). The points are more concentrated and widely dispersed on the outside than within the Buffelsdraai community boundary. This result can be closely linked to that landscape features to which concentration of the identified CES points is observed. These were identified to be primarily various types of plantations such as forests, the

mountains and slightly over the built up area both within and outside the border of the Buffelsdraai community.

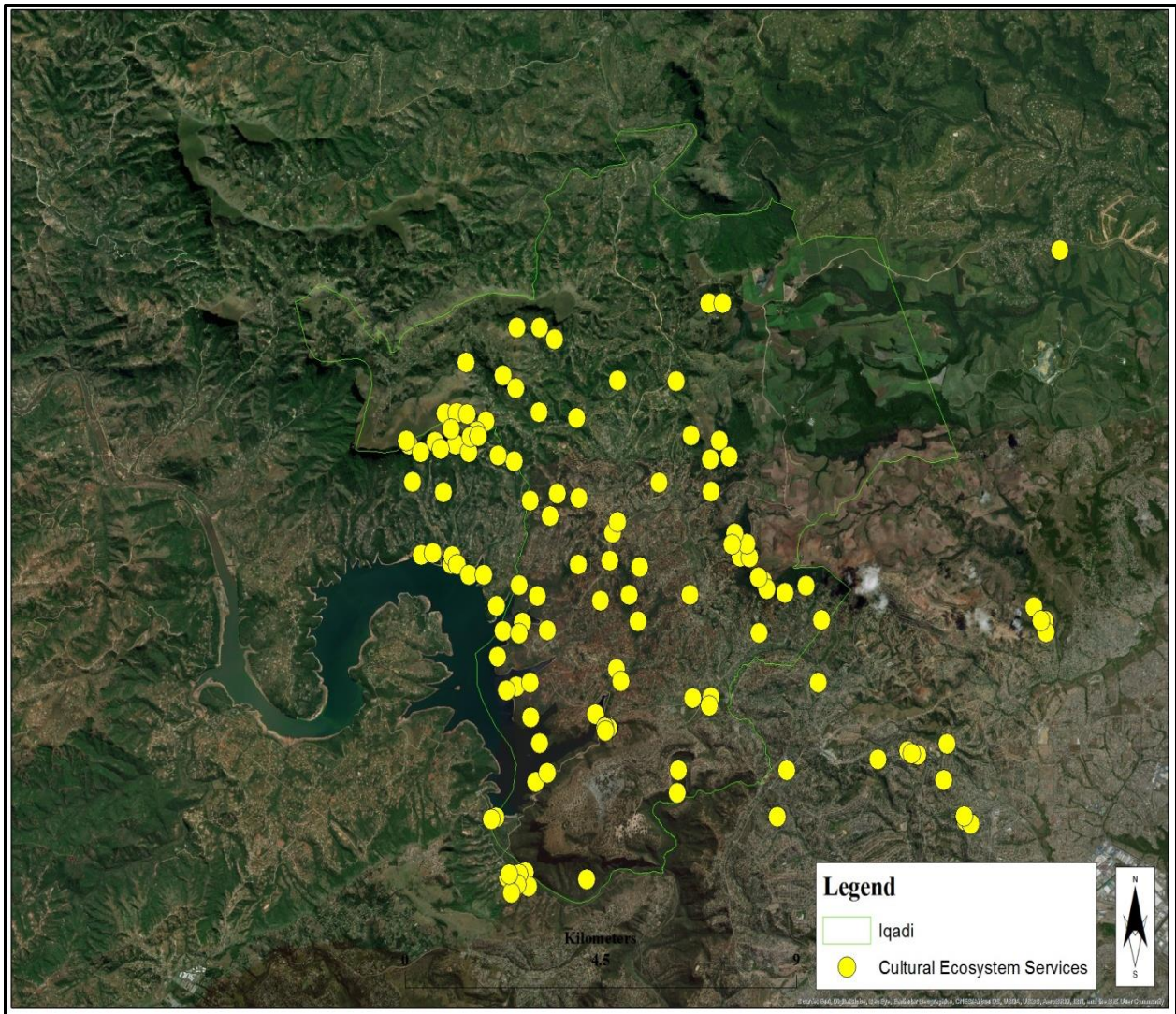


Figure 5.5: The spatial distribution of the perceived CES in Iqadi, eThekweni Municipality, KwaZulu-Natal

For the case of Iqadi, yellow points representing the identified CES can be observed within the community boundary as well as on the outside border of the Iqadi community (refer to Figure 5.5). The points are more concentrated and widely dispersed within the boundary than on the outside of the Iqadi community boundary. This result is also associated to the natural landscape features such as the built up area, various types of plantations, along the edge of the Inanda dam

and on the surrounding mountains which is where the concentration of the identified CES points is observed.

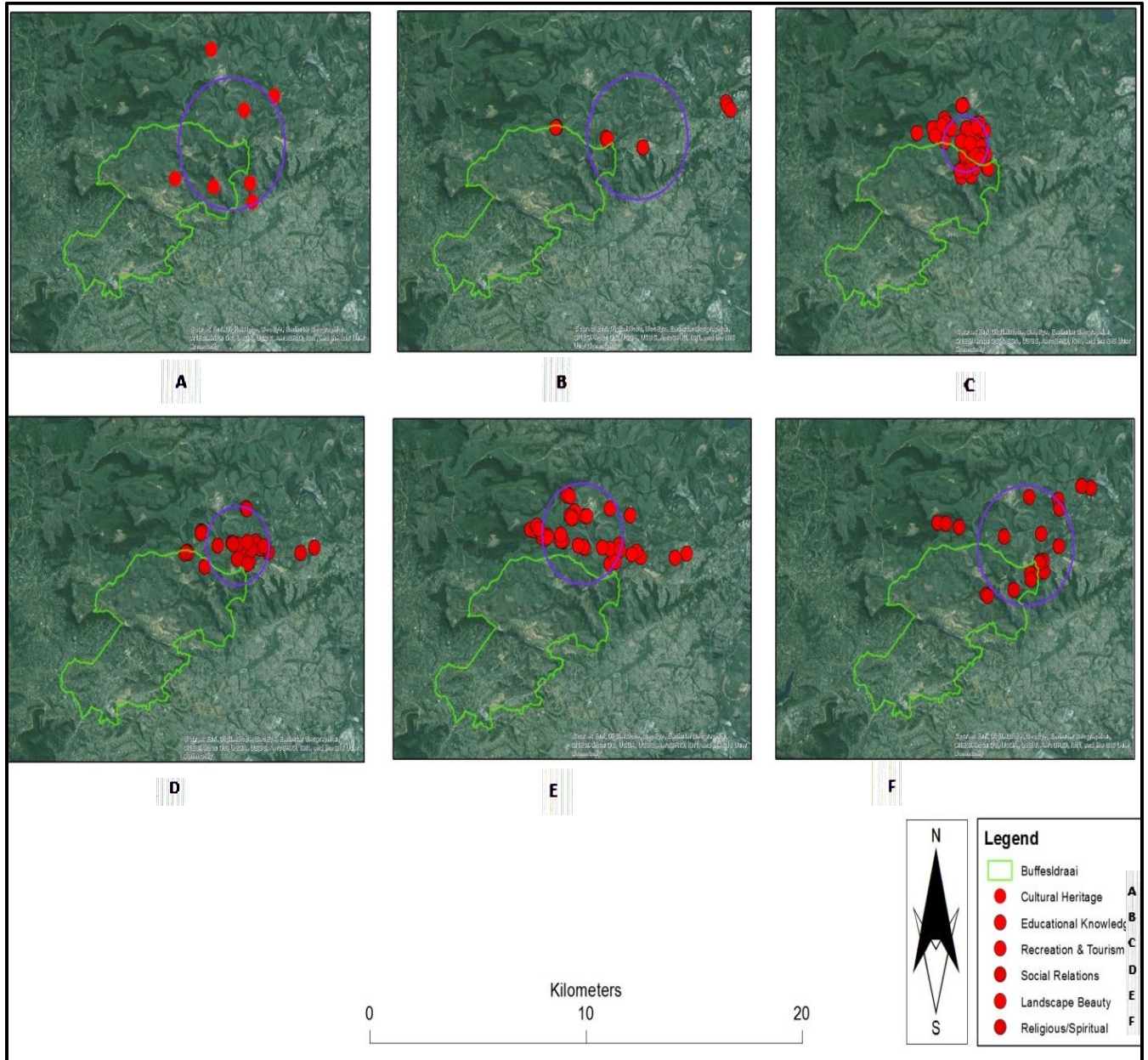


Figure 5.6: The concentration of each perceived type of CES in Buffelsdraai , KwaZulu-Natal in no particular order

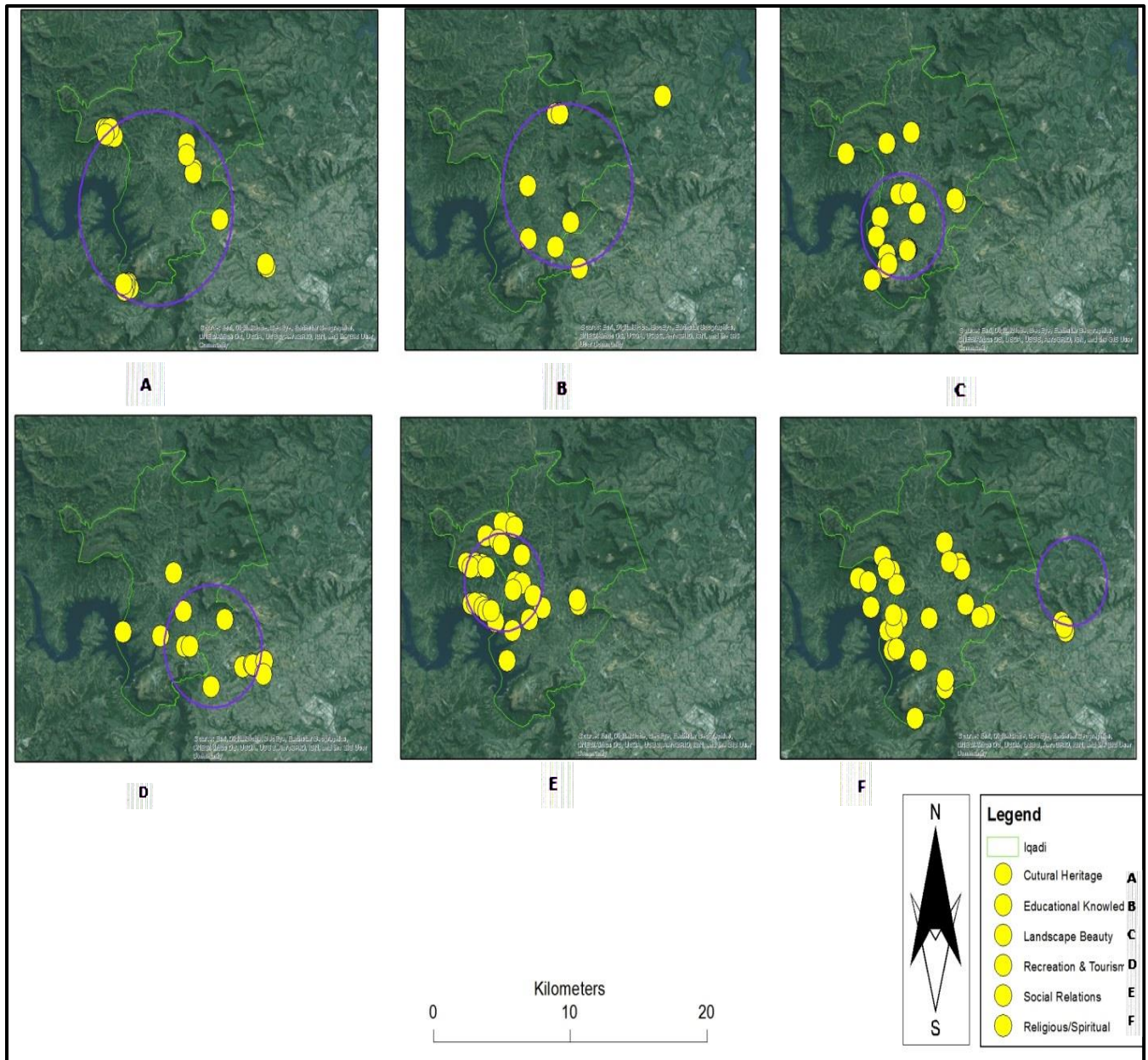


Figure 5.7: The concentration of each perceived type of CES in Iqadi, KwaZulu-Natal in no particular order

Figure 5.6 and 5.7 above represent each type of CES as perceived in Buffelsdraai and Iqadi, respectively. The blue circle and its size represent the hotspot for a particular type of CES. On the one hand, the bigger the circle, the wider the distribution resulting in less concentration of points in one area. On the other hand, the smaller the circle, the narrower the distribution resulting in more concentration of points in one area. Factors influencing the value of each CES varied mainly as a result of experiences or encounters of participants with ecosystems of

concern thus resulting in a spatially heterogenous distribution in both communities. These results also showed a link between landscapes, biodiversity as well as cultural and religious beliefs of Buffellsdraai and Iqadi communities.

Although this is the case, it is observed that among all types of CES, landscape beauty has the narrower distribution and the distribution is more towards and within Buffellsdraai and Iqadi community boundaries. This result can be further substantiated by that more than any other CES identified in this study, landscape value has scored the highest. Participants from both Buffellsdraai and Iqadi revealed that they find tranquility places far from and even within their places of residents. One participant from Iqadi mentioned that she associates tranquility with the garden located at the back of her household. This result is similar to the study by Oeloftse (2013) where local residents found gardens in their households to be aesthetically beautiful and invoke a sense of belonging.

5.3.3. CES and their relationship to land covers in Buffellsdraai and Iqadi

Nine main land cover types were identified in relation to the CES points by participants from both Buffellsdraai and Iqadi communities. The 8 landcovers included; built up dense area, bushland, forest, erosion, grassland, water bodies, agriculture and woodland.

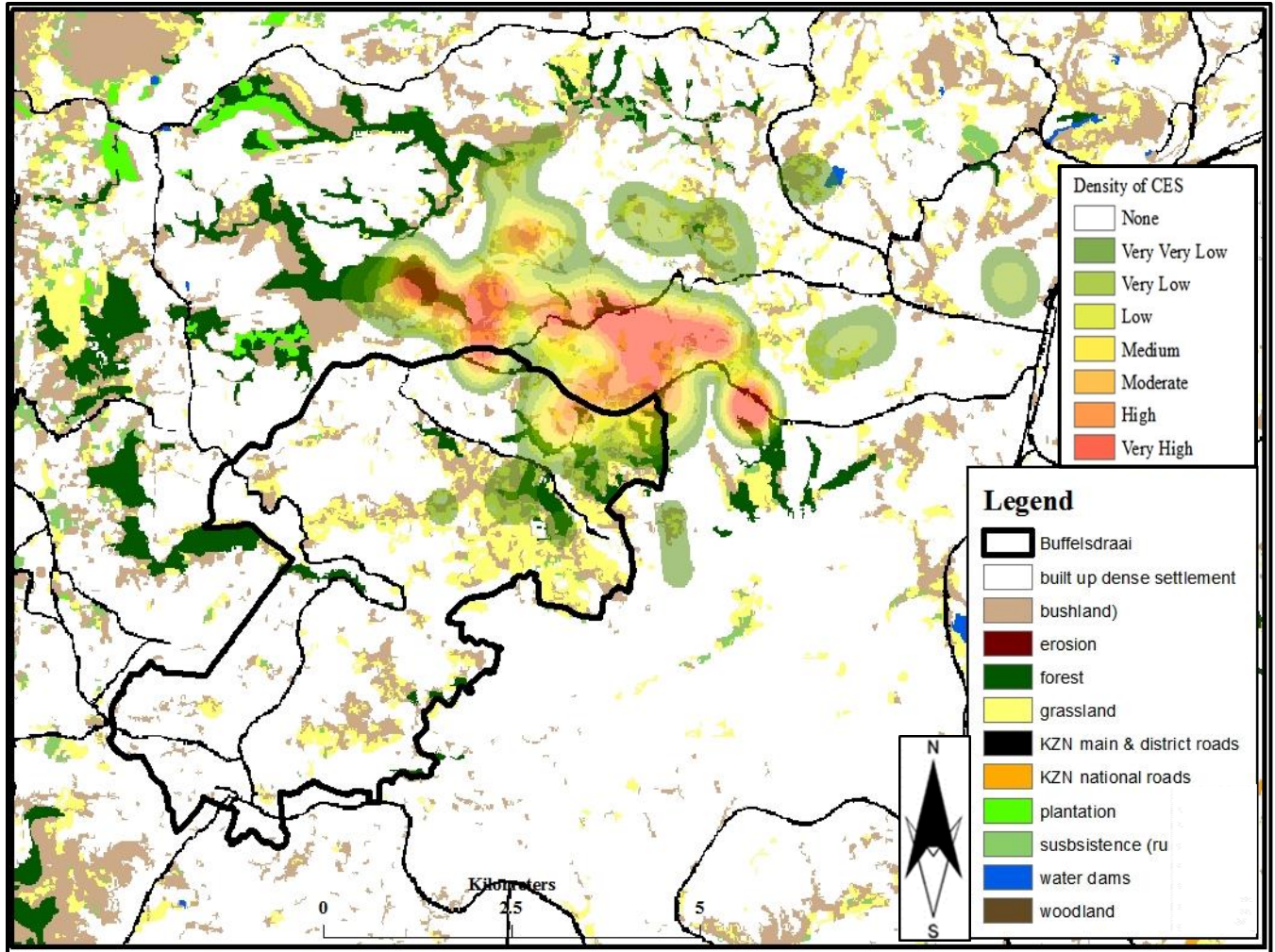


Figure 5.8: Landcover map of Buffelsdraai in eThekweni Municipality, KwaZulu-Natal

In Buffelsdraai, a high concentration of points is observed over bush land and forest land cover, while low concentration is observed mainly over the built-up dense area and grassland land cover. Participants from Buffelsdraai made associations that link these landcovers to landscape as well as spiritual and religious values (refer to figure 5.8).

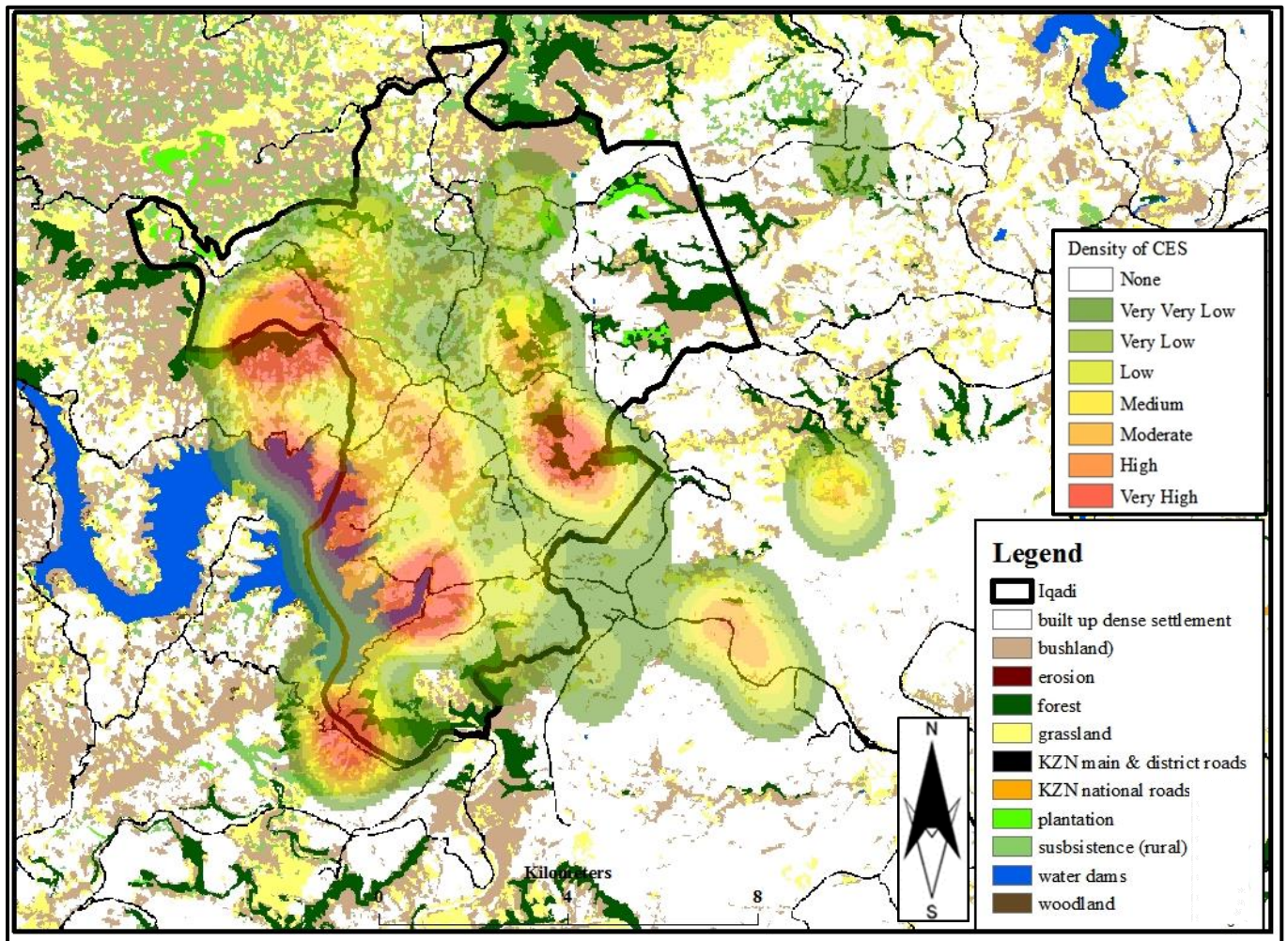


Figure 5.9: Landcover map of Iqadi in eThekweni Municipality, KwaZulu-Natal

In Iqadi (refer to figure 5.9 above, a high concentration of points is observed over the water bodies more particularly over the Inanda dam as well as on bush land and the forest landcovers whilst low concentration of CES is located over the built up dense settlement, grassland and roads respectively. Participants from Iqadi attributed landscape values, recreation and tourism activities in relation to water bodies. These findings reveal that the perceived CES in relation to various landcovers have a significant cultural role to the residents of the Buffelsdraai and Iqadi. Thus the identified areas with high concentration of CES values should be referred to as cultural hotspots.



Plate 5.2: Different types of landcovers observed along the Inanda dam in Iqadi, eThekwini Municipality, KwaZulu-Natal

5.3.4. Landscape Beauty

A

B

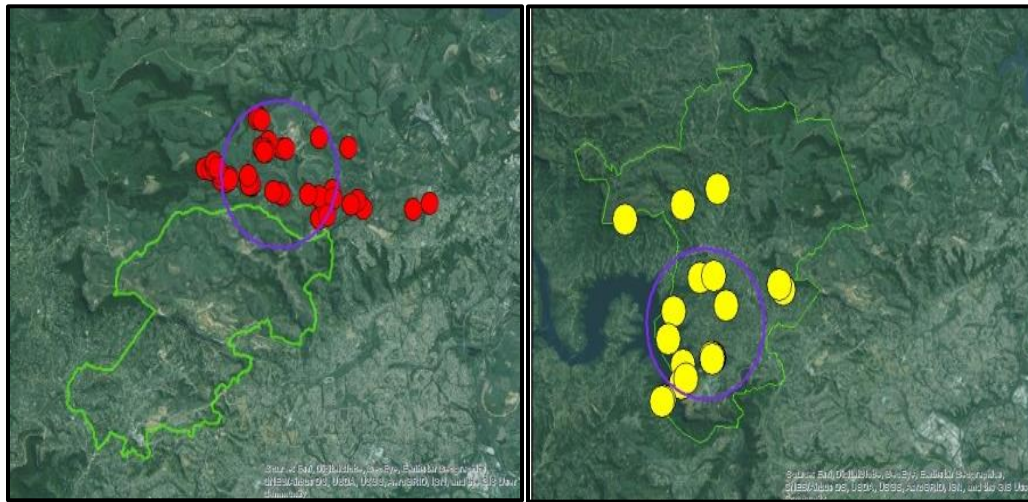


Figure 5.10: A) is the perceived CES points in relation to landscape values of Buffelsdraai participants B) is the perceived CES points in relation to landscape values of Iqadi participants

Participants were asked to identify areas in relation to landcovers within the respective communities that they enjoy for its aesthetic beauty and explain the reason for their choice. Participants from Buffelsdraai 23% chose the areas from within the restored forest as well as included bushland (refer to Figure 5.8. A). While 8% of Iqadi participants chose the dams followed by bushland 5% and the forest 2% (refer to Figure 5.8. B). Although the remaining 62% of the participants from Buffelsdraai indicated that they do not value the area for its natural beauty The researcher perceives that this area consisted of sugar cane plantations and tree planting only originated in 2010 and only a section of the project area consists of the landfill site which does not usually associate with aesthetics (Roy, 2015; Choi, 2017). During the focus group discussions participants mentioned to the researcher that they hoped to see wild animals in the reforested area. The participant's results for the Iqadi focus group discussion were influenced by their surrounding environment, which are dams, and the mountainous terrains, which is regarded significantly as the cultural heritage of the area that is rich in history (Diederichs and Roberts, 2015). Participants from Iqadi boasted about the area's history relating to Tata Nelson Mandela who casted his first vote in this area.



Plate 5.3: The scenic beauty of the Inanda dam and Inanda Mountain

5.3.5. Religious and Spiritual value

A

B

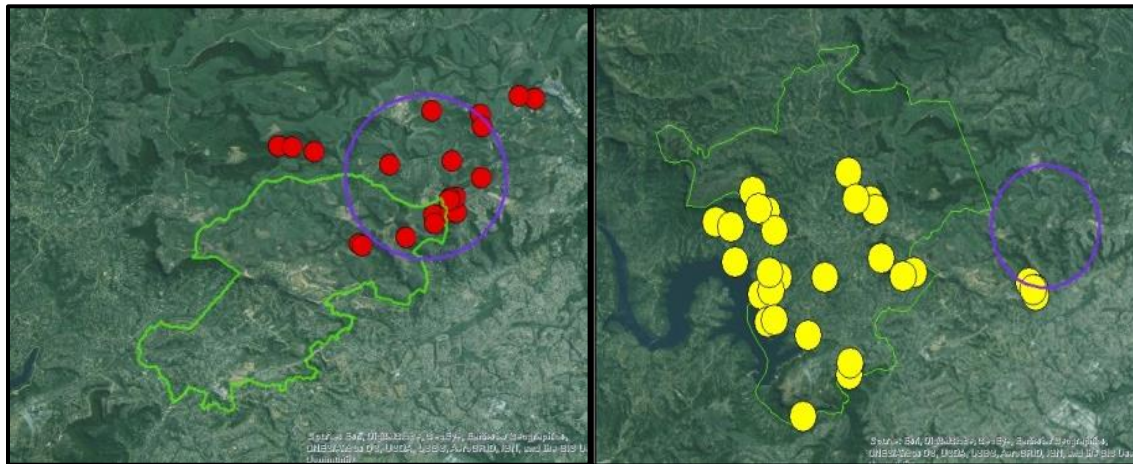


Figure 5.11: A) is the perceived CES points in relation to religious and spiritual values of Buffellsdraai participants B) is the perceived CES points in relation to religious and spiritual values of Iqadi participants

Buffellsdraai and Iqadi natural landscapes respectively can be associated with the spiritual and religious well-being of the locals. In both communities participants mentioned that they practice some sort of religious rituals in their surroundings. Participants from Iqadi 23% perceived the forest as a sacred place where the ancestors communicate with their descendants by means of messengers (referred to *izithunywa* in Isizulu) in the form of various animals. For example, one participant from Buffellsdraai mentioned that when an African python (*Inhlwathi* in Isizulu) enters the house, it is a symbol of luck and blessings from the ancestors and should be safely removed and not killed. In Buffellsdraai, 7% of the participants referred to churches as a place of worship. The researcher witnessed white Shembe stones which some participants claimed to worship. Although participants referred to church buildings as places of worship but they told the researcher that they use the river for baptism as well as other religious rituals at times.

The researcher witnessed dead chicken with red candles and razors on its head along the river banks in Buffellsdraai. To substantiate this, participants did vow to have witnessed cults and witchcraft being performed in the rivers. As a result of this, some participants mentioned to the researcher that they perceive the river to be unlucky.

Also, some participants from Iqadi mentioned to have used the river for *ukuthwasa* which is spiritual initiation, a phase or training that which one undergoes to become a traditional healer.

People who undergo this training are the ones who have been identified by other traditional healers to be possessed by ancestral spirits (Corcks et al., 2012). Spiritual initiation training usually involves rivers, oceans or waterfalls where it is believed that one goes hiding with a snake (which is believed to be one's ancestor) that keeps them underwater until they are ready to become a traditional healer (Mullen et al., 2013). This finding is supported by Cork (2018) who states that traditional healing is individual to cultures and contributes significantly to South Africa's cultural diversity.

Participants from Buffellsdraai However unlike those from Iqadi regard animals such snakes as being very dangerous. They further voiced out their dissatisfaction with living near the forest as having problematic animals such as wild cats and monkeys that cause damage to their vegetation such as crops and sometimes feed of heir livestock.



Plate 5.4: The Shembe circle which is one of the renowned South African churches as witnessed in the Buffellsdraai community

project started. This is also the case in Iqadi, as participants mentioned that although they live away from the restoration site, 12% indicated a potential for hunting on the reforested Inanda escapment. Participants from Iqadi further told the researcher that they have witnessed tourism activity in the area such as canoing in the Inanda dam. During this research, the researcher witnessed canoes parked on the edge of the Inanda dam (refer to Plate 5.7. A). A resort to accomodate tourists who visit the Inanda dam was also witnessed by the researcher (Plate 5.7. B).

Some participants even mentioned to have been part of tourism events such as the Inanda Jazz festival that takes place in the area annually. Other participants mentioned that they have enjoyed walking along the trails of the Inanda heritage route. Although Buffellsdraai participants recorded that they do not participate in recreation and tourism activities in the area, it is believed that with the Buffellsdraai community restoration project taking place, there is a huge potential for ecotourism within Buffellsdraai community.

A

B



Plate 5.5: A) The parked canoes on the edge of the Inanda dam B) The Msinsi resort witnessed near the Inanda dam

5.3.7. Cultural Heritage

A

B

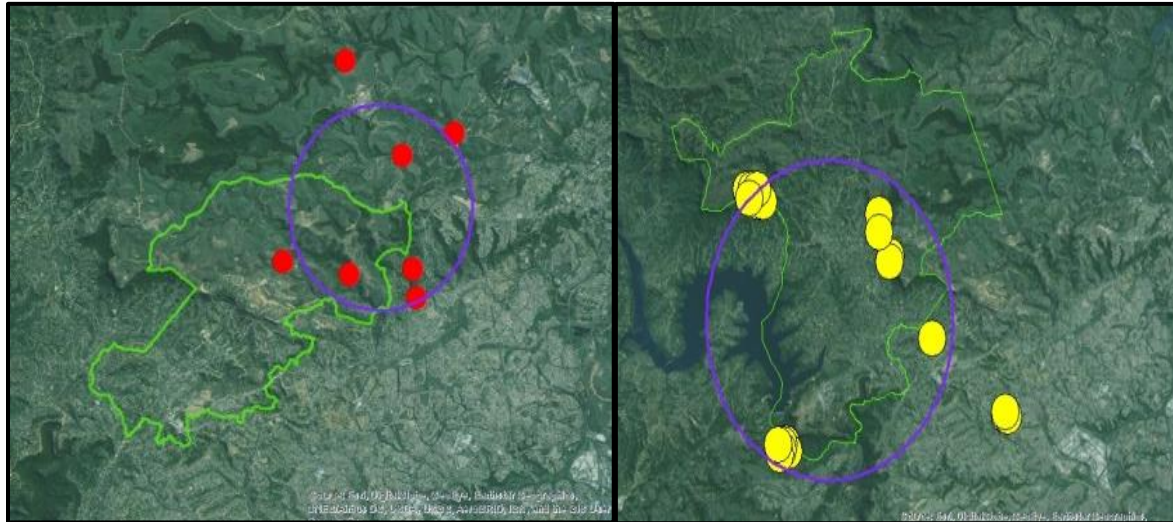


Figure 5.13: A) is the perceived CES points in relation to cultural heritage values of Buffellsdraai participants B) is the perceived CES points in relation to cultural heritage values of Iqadi participants

Culturally important sites were also reported to occur primarily within nearby forests and dams. Most identified sites in the Buffellsdraai 8% are dedicated for ritual ceremonies and 3% on offerings. In Iqadi, a whole 14% of the participants consider cultural heritage as related to their traditional ceremonies. These sites also serve as places where locals communicate with ancestral spirits (amadlozi) who play an important role in guiding and protecting lives of their descendants. Adekunle (2013), states that 80% of South Africans believe in ancestral spirits. Common ceremonies in the area include the good girl's behaviour ceremony (umemulo) and the purification ceremony (inhlambuluko). Umemulo is commonly practiced in the Zulu culture when a girl reaches the age of 21 and is still a virgin. On the day of the ceremony, a girl together with her friends is required to go to the nearby river for cleansing as a sign that she has entered womanhood and is ready for marriage.

The researcher also witnessed a house where girls voluntarily go for virginity testing in preparation for the well-known reed dance. The owner of the house is known as uMama wa nomkhubulwano. The house is regarded as the cultural heritage of the area. Participants of Iqadi also showed the researcher a few houses occupied by women who make cultural products for

clothing and decorating. Various groups who practice Zulu dance in the community were mentioned by the participants.

Participants from Iqadi mentioned three main cultural heritage sites that are found within the area such as the Ohlange Institute which is where Nelson Mandela casted his first vote in 1994 (Healy- Clancy, 2014). The Ohlange Institute which was the first School for African boys was established by Iqadi chief's son of that time, John Langalibalele Dube (Hansen, 2012). Among other sites mentioned by Iqadi participants was the Ekuphakameni, the religious site of the Shembe church that was established in 1901 by Prophet Isaiah Shembe (Marschall, 2010). Ekuphakameni remains the centre of worship that attracts thousands of pilgrims from all over South Africa for their annual festivals. When the church split over a succession battle in the late 1970s, Ebuhleni was established by Amos Shembe, it also continues to serve as the second worship centre for its believers (Marschall, 2017)

This result has revealed that Iqadi has a rich history and cultural heritage most of which is rooted in Zulu culture. This heritage is important to the local residents who have been living in the area for several years. More particularly, old people since it is believed that the generation of today ignore their cultural beliefs due to the influences from other cultures (Dromgoole, 2013). In Africa particularly, the negative influence of the English culture on the cultural beliefs, social norms and values of African cultures have been documented (Koopmann-Holm, 2014).



Plate 5.6: Mama Mangubane, an elder in the community who ensures that cultural values and practices are passed to young generations

5.3.8. Educational knowledge

A

B

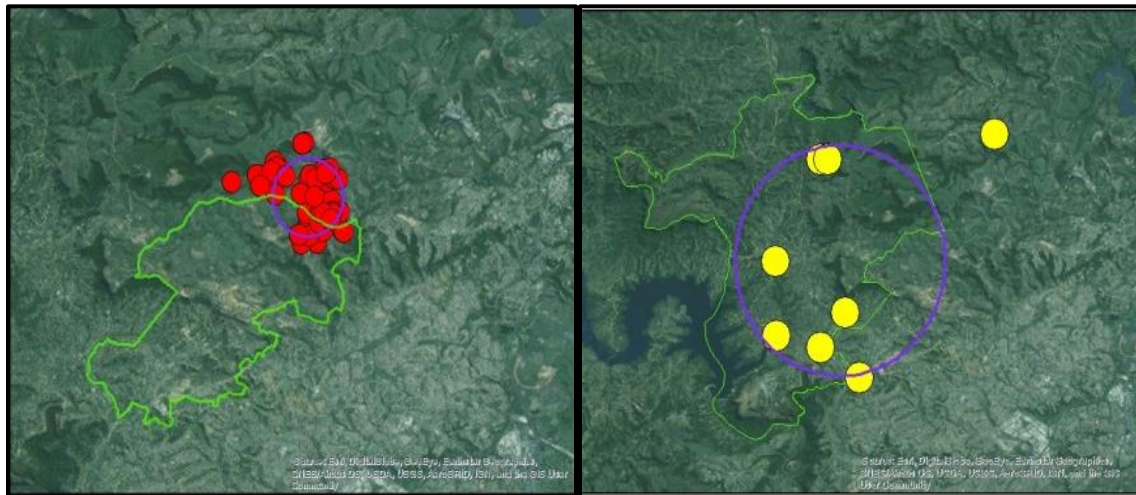


Figure 5.14: A) is the perceived CES points in relation to educational knowledge value of Buffellsdraai participants B) is the perceived CES points in relation to educational knowledge value of Iqadi participants

In Buffellsdraai, 3% of the participants acknowledged schools as places where they receive educational knowledge concerning culture, animals and plants. Whilst 4% indicated indigenous and generational knowledge as their sources of knowledge systems. This is the kind of knowledge and information that is shared through generations (Phillips, 2015). Two percent of participants from Iqadi also acknowledged that they attained educational knowledge about culture, animals and plants at school and 4% acknowledged indigenous and generational knowledge. Both reforestation sites have also been used extensively for other knowledge sharing and educational purposes. Currently, a total of 17 students from various campuses from the University of KwaZulu-Natal are undertaking projects within specific fields, addressing various aspects of the reforestation project which all links to the making the reforestation project a success. The Buffellsdraai educational centre is also used for formal school trips where the trained environmentalists from organisations such as WCT and WESSA teach children about the natural environment. Given the results discussed above, Hester (2010) argues that integrating indigenous local knowledge into educational knowledge remains critical for sustainable development to solve current environmental issues. Sustainable development has become

inclusive of local indigenous knowledge and its role in understanding current and future environmental complexities.



Plate 5.7: Above is the Buffelsdraai educationg centre located within the project area

5.3.9. Social relations

A

B

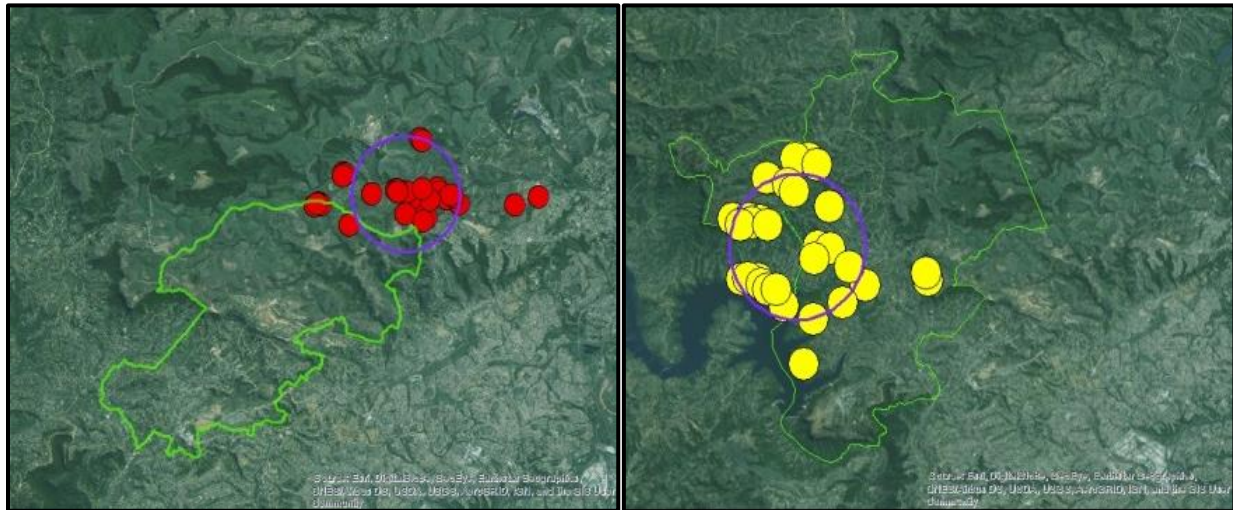


Figure 5.15: A) is the perceived CES points in relation to social relation values of Buffeldsdraai participants B) is the perceived CES points in relation to social relation values of Iqadi participants

Though most participants from both communities were not able answer this question, it was observed that the natural landscape in both study areas also foster social relations. Male participants from Buffeldsdraai and Iqadi respectively reported enjoying their time in the forests, mountains and rivers where they spend time for social purposes such as herding of cattle, harvesting of medicinal plants as well as sometimes hunting 8% and 3% cattle herd. Unlike female participants from 2 percent of participants from Buffeldsdraai and 1% from Iqadi respectively, suggested that they access the natural landscape primarily in the context of work within these communities. This result is similar with Keituetse (2016) who states that men are more social than women. This is especially true for women in traditional societies where cultural influences and power differentials occur.



Plate 5.8: local women preparing a garden that is used by the government feeding scheme at the local primary school in Iqadi

5.4. KEY INFORMANTS RESULTS

5.4.1. KEY INFORMANTS GENERAL BACKGROUND OF THE REFORESTATION PROJECTS

Table 5.5: Buffellsdraai and Iqadi key informant responses relating to their place of residence

	Buffellsdraai (n=5)		Iqadi(n=5)		Total(n=10)	Percentage(%)
	Female	Male	Female	Male		
Yes	2	2	2	3	9	90%
No	1	0	0	0	1	10%

Key informant participants were asked to indicate if they live or do not live within the project communities. Ninety percent of key informants 40% from Buffellsdraai and 50% from Iqadi respectively reside within the project communities. While only 10% from Buffellsdraai and none from Iqadi do not reside within the project areas. This finding could be due to that 5 key informants that interviewed were involved in the Buffellsdraai community reforestation project and Inanda escarpment community reforestation project, respectively. However, one participant was the co-ordinator for both projects. The participant only travels to the project communities if necessary such as when there are meetings. Wangai et al. (2017) substantiated this result by stating that a project should favour employing staff among people living close to the conservation area that it is trying to protect so that the locals can benefit from the project.

Table 5.6: Buffellsdraai and Iqadi key informant responses with regards to the number of years working in the project communities

Years working in the project	Buffellsdraai (n=5)	Iqadi(n=5)	Total(n=10)	Percentage(%)
< 1 year	1	-	1	10%
2-3 years	-	-	-	-
4-5 years	4	5	9	90%
Other ... (specify)	-	-	-	-

Key informant participants were asked to indicate the time that they have worked for Buffellsdraai and Inanda forest community reforestation projects. Most participants from Buffellsdraai mentioned 4 years and in Iqadi participants mentioned five years. While only 1 participant from Buffellsdraai stated that he has worked for less than a year. This result was found as most key informants that were interviewed indicated that they started working right after the Buffellsdraai and Inanda escarpment community projects were initiated in 2010.

Table 5.7: Buffellsdraai and Iqadi key informant responses in relation to the cultural use of landscape of communities.

Activity	Buffellsdraai (n=5)		Iqadi (n=5)		Total(n=10)
	Yes	No	Yes	No	
Hunting and fishing	****	*	*****	-	9
Food gathering	****	*	*****	-	9
Collection of traditional plants	*****	-	*****	-	10
Source of freshwater	*****	-	*****	-	10
Spiritual wellbeing/ ceremonies	*****	-	*****	-	10
Religious ceremonies	*****	-	*****	-	10
Education shelter	***	**	-	*****	8
Gathering firewood	*****	-	*****	-	10
Other ...	-	-	-	-	-

Key informants were also asked of their views regarding cultural use of landscape by the communities. key informants from Bufellsdraai indicate that they are aware that the community uses the landscape for cultural activities such as hunting and fishing, gathering of traditional plants, spiritual and religious ceremonies such as ukuthwasa (spiritual emergence) which is the period of ancestral training that one undergoes in order to become a traditional healer (Holms, 2017), wild foods such as imifino (herbs) and wild berries, gathering of firewood as well as livestock grazing. Key informants from Iqadi listed activities such as religious ceremonies and firewood gathering. Key informants explained to the researcher that both communities can be classified as traditional communities therefore cultural practices from these communities reflect the values and beliefs held by members of a community which is passed from generation to generation (Galatowitsch, 2009).

5.4.2. CES PERCEPTIONS OF BUFFELSDRAAI AND IQADI KEY INFORMANT PARTICIPANTS TOWARDS THE NATURAL LANDSCAPE

Natural landscapes are a complex phenomena, apart from physical features, natural landscapes are imbued with cultural values (Apostol et al., 2016). Taking this into consideration, participants were asked to reflect on some cultural values or thoughts that they have towards

their landscape. 6 out of 10 participants, three participants from each community mentioned values along the lines of aesthetics. One participant from Buffellsdraai was quoted saying that they are drawn to the natural landscape of Buffellsdraai because of its overwhelming beauty while another participant who was born in Buffellsdraai stated that the landscape of Buffellsdraai provides them with the sense of belonging.

The remaining 4 key informants both from Buffellsdraai and Iqadi expressed the importance of having access to their landscape to retain the connection with their ancestors and deemed some sites as those of spiritual significance. This result is supported by Fitcher et al. (2012) who argues that natural landscapes can be valued for different reasons by different people depending on different factors such as age, gender, personal experiences as well as the background of the person. Landscape values can also be determined by social groups whereby people belong as well being unique as an individual (Pollis, 2014; Sobo, 2016).

Key informants further stated that they have witnessed local residents performing cultural activities within Buffellsdraai and Iqadi. Some key informants from Iqadi even attested to have been part of these activities. This suggests the importance of considering various values when making decisions on how natural landscapes are best put to use. Key informants further mentioned that they believe in the need to conserve or sustain the ecosystems in Buffellsdraai and Iqadi for the cultural needs of local residents. In addition to this, key informants suggested that they feel that every stakeholder needs to be engaged and taught about CES found in these areas so that every one can be stewards of preserving CES in both Buffellsdraai and Iqadi.

5.4.3. KEY INFORMANT PERCEPTIONS TOWARDS PRESERVING CULTURAL ECOSYSTEM SERVICES IN BUFFELSDRAAI AND IQADI

All key informants felt that it is important for the local residents to access the reforested site for cultural reasons. They elaborated by stating that landscapes within the jurisdiction of any community cannot be underestimated for their fundamental role to the local residents with regards to livelihoods, cultural heritage and identity of those people. Similarly, Aronson (2012) argues that local community's access to land is important for biodiversity conservation because of their past contributions as stewards of the earth's ecosystems. Although, some key informants from Buffellsdraai stated that access to the reforested area may be granted under certain

circumstances. They believe that the rights of communities to access and use the reforested area should be decided by the government since the land belongs to the government. However Maler (2010) mentions otherwise saying that usually when communities allow to lease the land to the government for conservation or to give up their use of land in exchange for benefits, such as job opportunities and or co-management. These agreements automatically give right to the government to determine the allowed activities. Although community members may participate in decision making, those decisions are supervised by government officers.

5.5. OVERVIEW OF RESULTS

Although conflict of interests among stakeholders from both community reforestation projects was noted, the favorable responses to CES from communities presents a need to take into account local perceptions (Darvil and Lindo, 2014). While reforestation projects are meant for ecological restoration as well as societal benefits. This implies that improved understanding of the perceptions of the local communities about the advantages and disadvantages of reforestation projects may present a new way in which these projects are executed as well as to address gaps. This study has demonstrated the abundance of cultural benefits that residents from Buffellsdraai and Iqadi obtain from the natural environment. It is evident that local communities' lives are connected with their natural surroundings.

The relevance of landscape or scenery value in Buffellsdraai and Iqadi respectively can be explained considering a sense of place and belonging of the participants since most participants have been living in these communities for many years. Strong religious beliefs also reveals a sense of interconnectedness with nature, ancestral worship is core to the belief system of these communities. Other accounts mentioned by the local people who interact with nature included, recreation and the chance to observe wild animals. These findings establishes that not only the physical environment mediates cultural activities but also its biota plays a significant role within culture. It also reveals that regular access to nature for various activities is essential for the well-being of the local people. Furthermore, the results revealed how socio-economic factors such as age, gender and occupation influence the perceived CES. For instance, older people had a more optimistic perception of CES than the younger generation whilst females demonstrated more of an interest towards the importance of CES than their male counterparts. These results are important, and should be taken into account for the overall management of ES.

Findings also show that local people's relationship with nature is likely to be affected by the exclusion of the community in decision-making regarding their natural landscape as was depicted in the Venn diagrams (Figure 5.5 and 5.6). In Buffellsdraai, where decision-making and access to the site excludes the locals, illegal activities such as illegal hunting and harvesting of traditional medicinal plants can occur. Roy (2015) argues that the exclusion of locals from community projects has resulted in the failure of many reforestation efforts, as successful reforestation includes not just the rehabilitation of forests, but also understanding people's values towards the natural environment. This understanding is important for reforestation as it enforces local people's appreciation and protection of nature whilst strengthening their cultural identity (Mitchell, 2002). This can be done through educating local communities and involving them in decision making (Sinare, 2016).

This study also explored key informant perceptions as they are an essential part of the broader ES assessment framework (Darvil and Lindo, 2014). This enables the identification of the most relevant services to people. Findings reveal that key informants showed little interest on CES when compared to community participants. Although this can be attributed to that although some key informants may reside within Buffellsdraai and Iqadi communities, they are not originally from these communities. They formed an alliance with the community due to employment.

This study also found that CES in both Buffellsdraai and Iqadi community are not randomly distributed across the landscape, but rather occur in particular patterns leading to the classification of hotspots and cold spots in both study areas. High CES values were primarily attributed to bushland vegetation, as well as over natural landscape features such as water bodies and forests. This study also demonstrates that the identification of CES was related to particular natural landscape features as well as spatial features. Landscape features such as bushland and forests in close proximity to resident's homes seem to have particular meaningful values related to aesthetics, spirituality and religious as well as recreational values. This result indicates the irreplaceable value of forests to the locals as they portrayed the pleasure of interacting with nature.

Water bodies more particularly, the Inanda dam was of high significance for aesthetics, heritage and partly recreation. Built-up dense settlement, grassland and woodlands landscapes were hardly attributed any cultural values thus forming cold spots of CES. This broadly corresponds to the study by Ronchi (2018) that shows the connection of CES to the forests and water physical landscape features. The identification of hotspots and cold spots shows that some areas have high service delivery in relation to others. The CES and natural landscape features identified and spatially presented in this study thus translates to the ultimate goal of conservation (Borton, 2015).

5.5. CONCLUSION

From the findings of this study, it can be argued that CES remains important for the cultural identity of the rural communities. The maintenance of cultural services can serve as a powerful incentive for conserving ecosystems. While there has been a huge gap in assessing these services, effort into developing a better understanding of this type of service is vital. Cultural ecosystem services just as other categories of ecosystem services are equally important in understanding the benefits people obtain from the natural environment and should be considered a key of any ecosystem approach.

CHAPTER 6

CONCLUSION AND RECOMMENDATIONS

In this final chapter, general findings are synthesised. This chapter in relation to objective 3 outlines some recommendations for further integration to assess, map and incorporate CES into decision making with regards to broader ES planning.

6.1. CONCLUSION

This study assessed local community's and key informants perceptions as well as mapped CES associated with restored forest landscape in Buffellsdraai and Iqadi areas in eThekweni municipality, KwaZulu-Natal. Despite CES being critical determinants to natural resource use and management. To some extent limited research results contribute to natural resource degradation as land use planning and management tends to overlook CES in decision making.

Moreover, this study focused on CES within the context of restored ecosystems in this case a reforested rural landscape of Buffellsdraai and Iqadi communities. Participants from both communities were able to identify sites of particular aesthetic, social relations, cultural heritage, religious, spiritual and educational values. Among the identified CES, landscape beauty was of primary importance in Buffellsdraai and Iqadi. The findings also revealed that the spatial distribution of CES in Buffellsdraai and Iqadi is attributed to the surrounding landscape features. These findings highlighted that while CES provide community benefits and inform landscape planning, they also influence ownership and management of land which encourages the importance to incorporate CES into the broader ES planning decisions.

6.2. THEORETICAL REFLECTIONS

The conceptual frameworks that underpin this study revealed the importance of considering cultural dynamics as well participation of all stakeholders when development projects are concerned. The SLA strongly emphasises that in rural communities when initiating projects, the local community must not be treated as blank slates. After all, the locals usually have the enriched knowledge about communities in which they are from including the various needs and

problems that they may have. Their knowledge is crucial in any development project such as in the case of Buffellsdraai and Iqadi communities where the reforestation projects affect their cultural livelihood. In this study, it was also learned through this framework that education is important to foster empowerment and contribute to skills development.

The cultural ecology approach discussed in chapter 3 aided in understanding the links between the environment, culture and biodiversity. It was clear in this study that when considering to develop a community, one needs to take into account sustainable development (Beyens, 2015). This is to consider all spheres of a development project. Through using this approach, this study found that both Buffellsdraai and Iqadi are rich in cultural services. However the community reforestation projects undertaken withing these communities ignore the cultural aspects even though, these are noted to be crucial for reforestation efforts.

The political ecology theory assisted this study to understand the power differentials in relation to the Buffellsdraai and Inanda community reforestaion projects that exist between the communities and key informants. It was noted in this study that communities feel excluded from these projects. The political ecology theory suggests that people are at the core of any project that is meant to develop them and equally allow every stakeholder involved to be part of the decision making process (Mazibuko, 2013).

6.3. RECOMMENDATIONS

This study offers some points to consider with regard to further assessing perceptions and mapping CES in rural landscapes.

6.3.1. The Integration of scientific disciplines

As it was highlighted in the literature reviewed in this study that concepts and methods developed independently within the respective disciplines of science and social science are not sufficient to address the interrelated nature of ES (Brancalion and Chadzon, 2017). Within the ES community, there has been co-operation between social scientists, ecologists and economists however there is a need for more effective integration of various science disciplines such as

(Hahya and Franzese, 2014). When focusing on CES in particular the co-operation must be extended to a range of science and social science disciplines. This transdisciplinary approach will focus on the human component which can be used to promote more meaningful and effective understanding of CES (Hartel, 2014). Communities draw on multiple forms of knowledge to interpret problems within their environment, such as from scientific to local and traditional knowledge. To incorporate these different types of knowledge referring to approaches that do not only prioritise scientific knowledge at the expense of overlooking indigenous knowledge are more likely to provide varied aspects in a single study (Milcu, 2013). The reviewed literature provides examples of how integrating a broader range of social sciences could widen perspectives in the evaluation of ES and could enlighten collective policy and decision making process (Darvil and Lindo, 2014; Fish and Poschin, 2016).

6.3.2. Assessing and mapping interdependent CES

This research suggests several effective approaches for studying CES. The capacity of a given ecosystem to contribute to a given service for a given stakeholder group may fluctuate since uses are also dynamic (Colfer, 2016). In this context, CES assessments will anticipate the relevant social contexts and provide outputs that can be useful inputs towards social assessments. Also useful social science assessments will allow for explicit linkages to ecological structures and functions, both to determine ecological drivers of social behaviors and outcomes as well as anticipating these impacts (Chan et al., 2012). Methods for assessments and mapping of CES can be coupled with qualitative methods such as focus groups, participatory exercises as well as quantitative methods such as questionnaire surveys. The use of triangulation will unveil explicit links between social and ecological systems as well as to improve the integration of knowledge from scientists, policy makers, and various other stakeholders (Beyens, 2015).

6.3.3. The spatial dimension of CES

Spatially explicit visuals have promoted better understanding of ecosystem processes, including changes at different scales over time (Plieninger et al., 2013). Spatial referencing schemes have been offered for several CES, but the object classes usually implemented in GIS environments may not be sufficient to describe all interactions between ecosystems and social systems that define cultural services (Guerry et al., 2015). For example, determining the cultural heritage

significance of a specific ecosystem feature requires the participation of relevant stakeholder groups. Whereas, mapping the location of an identified feature can be straightforward, delineating precisely the boundary of the area within which land use changes could affect the associated heritage value can be challenging (Lopez-Santiago et al., 2014). All cultural services strongly depend on perceptions and expectations of the respective stakeholders, and considerable conceptual and technical work may be needed to assess the complex socio-ecological relationships (Holdstock, 2016).

6.3.4. The need to address trade-offs and synergies in CES framework

Ecosystems often support multiple services, synergies and trade-offs cannot be negotiated effectively if some services are unknown or ignored, which is likely to be the case for CES (Deng et al., 2016). The lack of information on interactions among services, many tradeoffs are still decided based on assumptions rather than facts often ignoring potential synergies as well (Costanza et al. 2014). Integrated socio-ecological assessments can provide information about trade-offs and synergies, resulting in effective decisions to manage conflicts.

Divergence between stakeholder groups and the need to integrate priorities for ecosystem management across spatial and temporal scales presents major challenges (Ritcher, 2014). Monetary valuation assessments have traditionally provided the foundation for resolving such complex trade-offs. The literature reviewed in this study provides examples of other effective approaches for resolving trade-offs among ES but suggests that more work is still needed in this area (Holleland et al., 2017).

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APPENDICES

Appendix 1

UNIVERSITY OF KWAZULU-NATAL
School of Agricultural, Earth and Environmental Sciences

**CULTURAL ECOSYSTEM SERVICES: PERCEPTIONS AND PARTICIPATORY
MAPPING, A CASE STUDY OF BUFFELSDRAAI AND QADI COMMUNITIES, KZN**
COMMUNITY QUESTIONNAIRE SURVEY

A. SOCIO - ECONOMIC PROFILE OF INDIVIDUAL

1. Gender of participant

1. Male	
2. Female	

2. Age of participant

1. 15 – 30	
2. 31- 40	
3. 41- 50	
4. 51- 60	
5. 61-70	
6. > 70 (specify)	

3. Nationality

1. South African	
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2. Nigerian		
3. Zimbabwean		
4. Mozambique		
5. Other ... (specify)		

4. Race

1. African		
2. Indian		
3. Coloured		
4. White		
5. Other ... (specify)		

5. Marital Status

1. Single		
2. Separated		
3. Widower		
4. Married		
5. Divorced		
6. Other ... (specify)		

6. Level of Education

1. None		
2. Primary education		
3. Secondary education		
4. Tertiary education		
5. ABET		

6. Other ... (specify)		
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7. Home Language

1. English		
2. IsiZulu		
3. isiXhosa		
4. Sesotho		
5. Other (Specify).....		

8. Disability

1. Yes	
2. No	

9. Occupation

1. Unemployed	
2. Domestic	
3. Labourer	
4. Professional	
5. Dependent	
6. Project beneficiary	
7. Pensioner	
8. Other ... (specify)	

10. Sources of income

1. Paid work	
2. Social grants	

3. Remittances		
4. Pension		
5. Other ... (specify)		

B) HOUSEHOLD CHARACTERISTICS

11. Type of dwelling

1. Traditional hut		
2. Brick/Concrete house		
3. Squatter		
4. Other ... (specify)		

12. Number of people living in your household

1. 1-3		
2. 4-6		
3. 7-9		
4. 10-12		
5. 13-15		
6. > 15 (specify)		

13. How long has the household been in the area?

1. 1- 5 years		
2. 6- 10 years		
3. 11- 15 years		
4. 16- 20 years		

7. 21-25 years		
8. 26-30 years		
9. 31- 35 years		
10. > 35 years (specify)		

14. Have you or your family lived elsewhere previously?

1. Yes	
2. No	

15. 1. If yes, why did you move here?

1. Forced removal	
2. Better prospects	
3. Other ... (specify)	

16. Sources of domestic water

1. Borehole	
2. Tap water	
3. Spring	
4. Surface water (river, dam etc.)	
5. Tank/ drum	
6. Other ... (specify)	

17. What kind of toilet (sanitation) service does your household have access to?

1. None	
2. Bush/ veld	

3. Pit toilet	
4. Flush toilet	
4. Other ... (specify)	

C) BUFFELSDRAAICOMMUNITY REFORESTATION PROGRAMME

18. Do you know of the Buffelsdraaireforestation project?

1. Yes	
2. No	

19. Are you or any other member of your family involved in the project?

1. Yes	
2. No	

19.1. If yes, in what capacity?

20. How far from the reforested site are you being located?

1. Within the site	
2. 1-5 km radius from the site boundary	
3. 6-10 km radius from the site boundary	
4. 11-15 km radius from the site boundary	
5. 16-20 km radius from the site boundary	
6. 21-30 km radius form the site boundary	

21. Do you think you will be forced to move out?

1. Yes	
--------	--

2. No	
-------	--

22. If yes, how will you be compensated?

1. Land	
2. Money	
3. Other ... (specify)	

23. Has the project invested in any of the following projects in the community?

	Yes	No
1. None		
2. Clinics		
3. Roads		
4. Schools		
5. Educational trust		
6. Housing		
7. Small businesses		
8. Sport facilities		
9. Events		
10. Community gardens		
11. Other... (specify)		

24. Does the project have the partnership with the community?

	Yes	No
1. Nobody		
2. Council		
3. Selected members		
4. Chief (Inkosi)		

5. Community organisations			
6. Other ... (specify)			

C. THE COMMUNITY AND NATURAL ENVIRONMENT

This section is about how you use your environment (a map of the area is provided for the questions in this section)

Wild Foods

25. Where in the forest do you collect wild foods? **Indicate on the map given**

26. How much of this contributes to your family diet? (Estimate)

1. None	
2. < 20 %	
3. Not much (20-40%)	
4. Average (50-70%)	
5. Very much (>80%)	

27. Which season(s) of the year do you collect wild foods?

1. Summer	
2. Spring	
3. Winter	
4. Autumn	

28. Which season(s) of the year do you experience shortage of wild foods?

1. Summer	
2. Spring	
3. Winter	
4. Autumn	

28.1 Explain

29. Can you identify the area(s) in your landscape where you collect material to make traditional items? **Indicate on the map given**

30. What cultural products (tangible or intangible goods/items created for a particular culture) do you make from these? **(Tick from the list below)**

30.1.

Tangible	
1. Musical instruments (e.g. drums)	
2. Traditional wear (impala skin, leopard skin)	
3. Pottery (e.g. Zulu clay pot)	
4. Art/ craft work (e.g. grass beaded strings)	
5. Household items (e.g. grass broom,	
6. Natural herbs (e.g. Incense)	
7. Other ... (specify)	

30.2.

Intangible		
1. Traditional dance		
2. Language		
3. Story telling		
4. Rituals		
5. Knowledge and skills		
6. Sports		
7. Other ... (specify)		

Medicinal Plants:

31. Can you identify the area (s) in your landscape where you collect medicinal plants? **Indicate on the map given**

32. What do you usually use these medicinal plants for? **(Tick from the list below)**

1. Rituals		
2. Healing of wounds/ infections		
3. Snake bites		
4. Allergies		
5. Cough		
6. Diseases (skins)		
7. Mental disorders		
8. Fever and flu		
9. Fertility purposes		
10. Other ... (specify)		

33. What do you usually do with the medicinal plants you harvest?

1. Sell	
2. Household consumption	

3. Other ... (specify)		
------------------------	--	--

34. Are these plants available all year round?

1. Yes	
2. No	

34.1. If not, explain

35. When these plants are not available, what do you do?

1. Purchase them from people selling them	
2. Use chemical drugs	
3. Other ... (specify)	

Firewood:

36. What type of energy do you use for cooking?

1. Firewood	
2. Gas	
3. Candles	
4. Paraffin stove	
5. Other ... (specify)	

37. If you use firewood, can you identify the area (s) in your landscape where you collect firewood? **Indicate on the map given**

38. Who in your household is responsible for collecting firewood?

1. Adult woman	
2. Adult Man	
3. Female child	
4. Male child	
5. Other ... (specify)	

39. How do you collect firewood?

1. Head-loading	
2. Bike	
3. Cart	
4. Truck	
5. Private Car	
6. Other... (specify)	

40. What do you usually use firewood for in your household?

1. Cooking	
2. Heating	
3. Light	
4. Baking	
5. Other ... (specify)	

Building:

41. Where in your area do you gather resources(s) for building? **Indicate on the map given**

41.1. What do you build with these resources? **(Tick from the list below)**

1. Roofing	
2. Thatch	
3. Huts	
4. Other ... (specify)	

Farming:

42. Where in your landscape do you farm? **Indicate on the map given**

43. What is your mode of farming?

1. Subsistence Farming	
2. Commercial Farming	

44. Does this household own the land that you farm on?

1. Yes	
2. No	

44. 1. If not, explain

45. Does this household own any livestock?

1. Yes	
2. No	

D) CULTURAL ECOSYSTEM SERVICES

(A map of the area is provided for the questions in this section)

Landscape Beauty:

46. Can you identify the area that you enjoy for its aesthetic beauty? **Indicate on the map given**

46.1. Explain

Recreation:

47. Where in your area are sites that you or others use for outdoor leisure activities? (E.g. hunting, relaxation, jogging, enjoy nature). **Indicate on the map given**

48.1. Explain

Religious /Spiritual value:

49. Where in your area are sites of spiritual or religious value? (E.g. sites for ritual ceremonies and offerings, burial grounds, prayers, ancestral worship). **Indicate on the map given**

49.1. Explain

Cultural Heritage

50. Can you identify the site(s) that are significant for your local history? **Indicate on the map given**

50.1. Explain

Social Relations:

51. Can you identify the site(s) that serve as meeting points for friends, peers, men, women, men, leaders, community members? **Indicate on the map given**

51.1. Explain

Educational knowledge:

52. Where in your area are sites used for knowledge sharing about plant and animal species of the forest?

52.1. Explain

53. Have these cultural ecosystem services been available to you even before the inception of the restoration project? (This refers to when the site was a sugar cane farm)

1. Yes	
2. No	

53.1. If yes, elaborate

54. Have you noticed any changes in the availability of any cultural services as a result of weather?

1. Yes	
2. No	

54.1. If yes, explain how these changes affect you personally?

E. ACCESS

55. Do you have access to the Buffellsdraaireforested site?

1. Yes	
2. No	

56. If not, please state the reason(s) why you would like to be granted access to the reforested site?

57. What do you do if you are not allowed to use the site any longer?

58. Please tick some of the problems you face as a result of living next to the forest

1. Noise	
2. Bad smell	
3. Crop raiding	
4. Wild animals	
5. Other ... (specify)	

58.1. Provide suggestions on how to solve these problems?

F. SUGGESTIONS

59. Do you think people over utilize resources from the forest?

1. Yes	
2. No	

59.1. If yes, what rules would you suggest for the use of the reforested site?

60. What role would you play to protect or preserve the cultural ecosystem services in Buffellsdraai ?

THANK YOU FOR YOUR PARTICIPATION



UNIVERSITY OF KWAZULU-NATAL
School of Agricultural, Earth and Environmental Sciences

**CULTURAL ECOSYSTEM SERVICES: PERCEPTIONS AND PARTICIPATORY
MAPPING, A CASE STUDY OF BUFFELSDRAAI AND QADI COMMUNITIES, KZN**

I QUESTIONNAIRE Survey YOMPHAKATHI

A. IMININGWANE YAKHO

1. Ubulili

1. Isilisa	
2. Isifazane	

2. Iminyaka

1. 15 – 30	
2. 31- 40	
3. 41- 50	
4. 51- 60	
5. 61-70	
6. > 70 (chaza)	

4. Udabuka kuphi

1. eSouth Afrika	
2. eNigeria	
3. eZimbabwe	

4. eMozambique		
5. okunye ... (chaza)		

4. Ibala lakho

1. Ngingum Afrika		
2. Ngingumndiya		
3. Ngiyikhaladi		
4. Ngimhlophe		
5. okunye ... (chaza)		

5. Isimo sakho somshado

1. Angishadile		
2. Sihlukene		
3. Ngumfelokazi		
4. Ngishadile		
5. Ngi-divosile		
6. Okunye ... (chaza)		

6. Inzinga Lemfundo

1. Angifundanga		
2. Izinga eliphansi		
3. Izinga eliphakathi		
4. Izinga eliphezulu (Enyuvesi)		
5. uABET		
6. Okunye ... (chaza)		

7. Ulimi Lwasekhaya

1. Isingisi		
2. IsiZulu		
3. isiXhosa		
4. isisotho		
5. Okunye (chaza).....		

8. Ukukhubazeka

1. Yebo		
2. Cha		

9. Usebenza kuphi/msebenzi muni

1. Angisebenzi		
2. Isisebenzi sasendlini		
3. Emasimini		
4. Ungcweti kokuthile		
5. Ngingumondliwa		
6. Ngihlomula kwi-Projecti		
7. Impesheni		
8. Okunye ... (chaza)		

10. Imithombo engenayo

1. Umsebenzi okhokhelayo		
2. Igranti		
3. Imali ethunyelwe		
4. Impesheni		
5. Okunye ... (chaza)		

B) IMININGWANE YASEKHAYA

11. Inhlobo yomuzi

1. Isiqongo		
2. Indlu yakhonkolo		
3. Imijondolo		
4. Okunye ... (chaza)		

12. Inani labantu abahlala lulelikhaya

1. 1-3		
2. 4-6		
3. 7-9		
4. 10-12		
11. 13-15		
12. > 15 (chaza)		

13. Senihlale iminyaka emingaki kulendawo?

1. 1- 5 years		
2. 6- 10 years		
3. 11- 15 years		
4. 16- 20 years		
13. 21-25 years		
14. 26-30 years		
15. 31- 35 years		
16. > 35 years (chaza)		

14. Nike nahlala kwenye indawo ngaphambi kokuba nihlale lapha?

1. Yebo	
2. Cha	

15. 1. Uma uvuma, yini enenze nazohlala lapha kulendawo?

1. Ukuxoshwa ngokwendluzula	
2. Impilo encono	
3. Okunye ... (chaza)	

16. Niwathola noma niwakha kuphi amanzi?

1. Epitsini	
2. Empompini	
3. Emthonjeni	
4. Emfuleni	
5. Ethangeni	
6. Okunye ... (chaza)	

17. Nisebenzisa yiphi inhlobo yendlu yangasese?

1. Ayikho	
2. Indle	
3. Indlu yangasese yangaphandle	
4. Indlu yangasese e Flashwayo	
4. Okunye ... (chaza)	

C) IPROJECTI YOKUBUYISELWA KWEZIHLEHLA YEMPHAKATHI

18. Uyazi nge projecti yokutshalwa kwezihlehlala yase Buffelsdraai/ Inanda ?

1. Yebo	
2. Cha	

19. Ngabe kukho owomndeni noma abomndeni wakho abayingxenye yayo le projecti ?

1. Yebo	
2. Cha	

19.1. Uma uvuma, ngayiphi indlela?

20. Ngabe uhlala eduze kangakanani nayo lendawo yokubuyiselwa kwezihlehlala?

1. Ngaphakathi kwayo	
2. 1-5 km ngaphandle kwayo	
3. 6-10 km ngaphandle kwayo	
4. 11-15 km ngaphandle kwayo	
5. 16-20 km ngaphandle kwayo	
6. 21-30 km ngaphandle kwayo	

21. Uma ucabanga, kungenzeka yini ususwe la uhlala khona ngelinye ilanga?

1. Yebo	
2. Cha	

22. Uma uvuma, ucabanga ukuthi bangakunxephezela ngayiphi indlela?

1. Ngomhlaba	
2. Ngemali	

3.Okunye ... (chaza)		
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23.Kungabe le projecti kukhona okunye kwaloku esike yakwenza emphakathini wangakini?

	Yebo	Cha
1. Lutho		
2. Imitholampilo		
3. Imigwaqo		
4. Izikole		
5. Ixhasa kwezokufunda		
6. Izindlu		
7. Amabhizinisi amancane		
8. Izinkundla zemidlalo		
9. Imigubho		
10. Izingadi		
11. Okunye... (chaza)		

24. Uma ucabanga, ngabe bukhona ubudlelwane kule projecti kanye nomphakathi?

	Yebo	Cha
1. Akekho		
2. Ikhansela		
3. Abantu abathile bomphakathi		
4. Inkosi		
5. Iziprojecti zomphakathi		
6. Okunye ...(chaza)		

C. UBUDLELWANO BOMPHAKATHI KANYE NEMVELO

Lengxenywe yemibuzo igxile ekwazini ubudlelwano phakathi kwabantu kanye nemvelo (izimpendulo zakule ngxenywe yemibuzo kuzomele ziphendulwe kuhambisana no mfanekiso womhlaba ozonikezwa wona).

Ukudla kwasendle

25. Imamalaphi nehlathi lapho uthola khona ukudla kwasendle? (Cela ukhombise kumfanekiso womhlaba onikezwe wona)

26. Okungakanani kwaloku okusebenzisa ekhaya? (linganisa)

1. Akukho	
2. < 20 %	
3. Kancane (20-40%)	
4. Okulingene (50-70%)	
5. Kakhulu (>80%)	

27. Ikuyiphi isizini noma amasizini lapho niwathola khona kakhulu?

1. Ihlobo	
2. Inkwindla	
3. Ubusika	
4. Intwasahlobo	

28. Ikuyiphi isizini noma amasizini lapho ukudla kwasendle kungatholwa khona?

1. Ihlobo	
2. Inkwindla	
3. Ubusika	
4. Intwasahlobo	

28.1 Chaza

29. Cela ukhombise indawo noma izindawo lapho uthola khona izimpahla zokwenza izinto zesintu? **(Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

30. kungabe iziphi izinto zesintu okwazi ukuzakha kulezi ezibekiwe ngezansi (ezingokoqobo nezingaphatheki)? **(Khombisa ngokumaka)**

30.1.

Ezingokoqobo	
1. Ezogubhu (njenge dramu)	
2. Izinto zokughoka zesintu (njenge bheshu)	
3. Okubunjiwe (njenge ukhamba)	
4. umsebenzi wezandla/ okuthungiwe (njenga mabhengela)	
5. Izinto zasendlini (njengo mshanelo wotshani)	
6. Izintelezi (njenge mpepho)	
7. Okunye... (chaza)	

30.2.

Ezingaphatheki	
1. Umdanso wesintu	
2. Ulimi	
3. Izinganekwane	
4. Imisebenzi	

5. Ulwazi nama khono	
6. Ezemidlalo	
7. Okunye ... (chaza)	

Imithi yasendle:

31. Engabe niyimba kuphi imithi endaweni yakho? (Cela ukhombise kumfanekiso womhlaba onikezwe wona indawo laph uthola khona)

32. Ngabe uyisebenzisela kuphi? (**Maka kuloku okubekiwe ngezansi**)

1. Imisebenzi ethile	
2. Ukuphulukisa izilonda	
3. Ubuthi benyoka	
4. Umzimba omubi	
5. Ukukhwehlela	
6. Izifo zesikhumba	
7. Izifo zengqondo	
8. Umkhuhlane wamakhaza	
9. Izifo zesinye noma zokungatholi abantwana	
10. Okunye ... (chaza)	

33. Ngabe loku ujwayele ukusebenzisa kanjani?

1. Uyakudayisa	
2. Ukudla kwasekhaya	
3. Okunye... (chaza)	

34. Ngabe lemithi iyatholakala masizini wonke? ?

1. Yebo	
2. Cha	

34.1. Uma uvuma, Chaza

35. Uma lezitshalo zingatholakali, wenza njani?

1. Ngizithenga kwabazidayisayo	
2. Ngisebenzisa imithi yakwadokotela	
3. Okunye ... (chaza)	

Uketheza:

36. Ngabe usebenzisa kuphi kuloku okubekwe ngezansi ukuze upheke nsuku zonke ?

1. Uketheza	
2. Igesi	
3. Amakhandlela	
4. Istofu samalahle	
5. Okunye ... (chaza)	

37. Uma utheza, Utheza kuphi emhlabeni wakho? **(Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

38. Ubani ekhaya othezayo?

1. Umama	
----------	--

2. Ubaba	
3. Intombazane	
4. Umfana	
5. Okunye ... (chaza)	

39. Uma senithezile, nizifikisa kanjani izinkuni ekhaya?

1. Ukuthwala	
2. Ibhayisekile	
3. Inqolo	
4. Ithiloko	
5. Imoto encane	
6. Okunye... (chaza)	

40. Ikuphi kwaloku enikusebenzisela izinkuni kakhulu?

1. Ukupheka	
2. Ukubasa	
3. Ukukhanyisa	
4. Ukubhaka	
5. Okunye ... (chaza)	

Ukwakha:

41. Kulaphi nomhlaba lapho khona nithola khona izinto zokwakha? **(Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

41.1. Ngabe wakha/wenza ini ngaloku? **(Maka kuloku onikwe kona ngezansi)**

1. Umpheme wendlu	
-------------------	--

2. ukufulela	
3. Isiqoqo	
4. Okunye ... (chaza)	

Ukulima:

42. Kumalaphi nendawo lapho khona ulima khona endaweni yakho? **Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

43. Wenza hlobo luni lokulima?

1. Ukulimela ukudla	
2. Ukulimela ukudayisa	

44. Ngabe indawo lapho ulima khona eyakho?

1. Yebo	
2. Cha	

44. 1. Uma uphika, chaza

45. Ngabe unayo impuyo kulelikhaya lakho?

1. Yebo	
2. Cha	

D) CULTURAL ECOSYSTEM SERVICES

(Umfanekiso womhlaba wangakini uzonikezwa ukuze uphendule imibuzo elandelayo)

Ubuhle bendawo:

46. Engabe ububona ngaphi ubuhle obedlulele endaweni yakho? **(Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

46.1. Chaza

Ukuzijabulisa:

47. Iyiphi indawo oyisebenzisela ukungcebeleka nokuzithokozisa endaweni yakho, noma isetshenziswe ngabanye abantu? Ukuzingela, kubhukuda ngezikebhe, ukudoba nokunye? **(Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

48.1. Chaza

Amasiko:

49. Iyiphi indawo emhlabeni wakho lapho uxhumana khona noNkulunkulu noma namadlozi? Angaphi amathuna noma izindawo zingwele? **(Cela ukhombise kumfanekiso womhlaba onikezwe wona)**

49.1. Chaza

Izinto zomdabu:

50. Iyiphi indawo emhlabeni wakho oyisebenzisela noma ebalulekile ngokwesiko (**Cela ukhombise kumfanekiso womhlaba onikezwe wona**)

50.1. Chaza

Ukuhlangana nokuzwana komphakathi:

51. Iyiphi indawo endaweni yakho oyisebenzisela imihlangano yekhaya noma yomphakathi? (**Cela ukhombise kumfanekiso womhlaba onikezwe wona**)

51.1. Chaza

Ulwazi :

52. Engabe zikhona yini izindawo lapho nihlanganela khona ukufundisa ngezilwane noma izitshalo ezibalulekile ngokwesiko emphakathini wenu? (**Cela ukhombise kumfanekiso womhlaba onikezwe wona**)

52.1. Chaza

53. Ngabe lemvelo ubukwazi ukuyithola nangaphambi kokusombululwa kwe projecti?

1. Yebo	
2. Cha	

53.1. Uma uvuma, chaza kabanzi

54. Ngabe uke wakunaka ukushintsha kwendawo lapho imvelo itholakala khona ngenhla yokushintsha kwesimo sezulu?

1. Yebo	
2. Cha	

54.1. Uma uvuma, kungabe lolushintsho luzokuphazamisa ngendlela ethize? (chaza)

E. IZIMVUMO

55. Ngabe unayo na imvumo yokusebenzisa indawo ebiyelwe?

1. Yebo	
2. Cha	

56. Uma uthi cha, isho isizathu noma izizathu zokufuna ukusebenzisa lendawo ebiyelwe?

57. Ungaphatheka kanjani uma ungasavunyelwe ukuyisebenzisa lendawo ebiyelwe?

58. Please tick some of the problems you face as a result of living next to the forest

1. Umsindo	
2. Ukunuka	
3. Ukudliwa kwezitshalo	
4. Izilwane zasendle	
5. Okunye ... (Chaza)	

58.1. Ngokucabanga kwakho, zingaxazululwa kanjani lezi zinkinga?

F. IMIBONO

59. Ngokucabanga kwakho, ngabe abantu bayayixhaphaza yini imvelo endaweni yangakini?

1. Yebo	
2. Cha	

59.1. Uma uvuma, ucabanga ukuthi kungenziwa njani ngaloku?

60. Wena iyiphi indima ongayidlala ukunakekela izinsiza zemvelo emhlabeni wangakini?

SIYABONGA UKUTHI UBE INGXENYE YALOLUCWANINGO

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UNIVERSITY OF KWAZULU-NATAL
School of Agricultural, Earth and Environmental Sciences

**CULTURAL ECOSYSTEM SERVICES: PERCEPTIONS AND PARTICIPATORY
MAPPING, A CASE STUDY OF BUFFELSDRAAI AND IQADI COMMUNITIES,
KZN**

KEY INFORMANT QUESTIONNAIRE SURVEY

A. KEY INFORMANT PROFILE

1. Job Title: _____

2. Gender of participant

1. Male	
2. Female	

3. Age of participant

1. 15 – 30	
2. 31- 40	
3. 41- 50	
4. 51- 60	
5. 61-70	
6. <70 (specify)	

4. Nationality

1. South African	
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2. Nigerian		
3. Zimbabwean		
4. Mozambiquan		
5. Other ... (specify)		

5. Race

1. African		
2. Indian		
3. Coloured		
4. White		
5. Other ... (specify)		

6. Marital Status

1. Single		
2. Separated		
3. Widower		
4. Married		
5. Divorced		
6. Other ... (specify)		

7. Level of Education

1. None		
2. Primary education		
3. Secondary education		
4. Tertiary education		
5. ABET		

6. Other ... (specify)		
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8. Home Language

1. English		
2. IsiZulu		
3. isiXhosa		
4. Sesotho		
5. Other (Specify).....		

9. Disability

1. Yes	
2. No	

10. Do you live in the surrounding communities?

1. Yes	
2. No	

10.1. If yes, please state the name of the area.

11. How long have you worked at Buffelsdraaireforestation site?

1. < 1 year	
2. 2-3 years	
3. 4-5 years	
4. Other ... (specify)	

B. PERCEPTIONS OF CULTURAL ECOSYSTEM SERVICES

12. Do you know if the community uses the landscape for the following activities? (Multiple answers allowed)

Activity	Yes	No
1. Hunting and fishing		
2. Food gathering		
3. Collection of traditional plants		
4. Source of freshwater		
5. Spiritual wellbeing/ ceremonies		
6. Religious ceremonies		
7. Education shelter		
8. Gathering firewood		
9. Other ... (specify)		

13. What cultural values or thoughts do you have towards your landscape? Explain

14. Do you think that the locals should be granted access to the forested site for cultural reasons?

1. Yes	
2. No	

14.1. If yes, under which conditions should access be granted?

15. Do you believe in the need to conserve or sustain your natural resources for your cultural needs in Buffellsdraai ?

1. Yes	
2. No	

15.1. Explain

16. Who do you think is responsible for preserving cultural ecosystem services in your area?

	Yes	No
1. Local communities		
2. eThekweni Municipality		
3. Wildlands Conservation Trust and other Conservation organizations		
4. The Government		
5. Other ... (specify)		

17. What would you suggest as ways to conserve cultural ecosystem services in Buffellsdraai ?

Appendix 3



UNIVERSITY OF
KWAZULU-NATAL

School of Agriculture, Engineering and Science

Discipline of Geography

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PIETERMARITZBURG, 3209

South Africa

Project title: Cultural ecosystem services: Perceptions and Participatory mapping, A case study of Buffellsdraai and Iqadi communities, KwaZulu-Natal

You are invited to take part in an interview that seeks to assess the perceptions of local people in relation to cultural ecosystem services within Buffellsdraai . Please read this form carefully and ask any questions you may have before agreeing to take part in the interview.

What the study is about: The aim of the study is to assess the perceptions of local people in relation to cultural ecosystem services within Buffellsdraai . The study will assist in understanding the link between biodiversity and ecosystem services and how to use such services to make a case for biodiversity. This study will also educate the local communities on the importance of preserving the environment if they can understand what the benefit from the reforestation project.

What I will ask you to do: If you agree to be interviewed, you will be asked to give your views on cultural ecosystem services provided by Buffellsdraai . You will also be asked to identify and suggest possible alternative strategies. The interview will take about 30 – 45 minutes to complete. I will then write about your experiences with reference to relevant research and policies to come up with possible recommendations.

Risks and benefits:

I do not anticipate any risks to you participating in this study other than those encountered in day-to-day life.

There are no direct benefits to you, although you may find it interesting to think about these issues.

Taking part is voluntary: Taking part in this interview is voluntary. You may refuse to answer any questions that you do not want to answer. If you decide to skip some of the questions or withdraw, you will not be penalized in any way.

Your identity will be protected. In the research, you will be referred to by a pseudonym.

Your answers will be confidential. The records of the interview will be kept private. At the end of this semester, they will be destroyed.

If you have questions: The Supervisor who has set this research is Dr S. Desai. If you have any questions, you may contact her at Desai@ukzn.ac.za

Statement of Consent: I..... (Full names of participant) hereby confirm that I understand the contents of this document and the nature of the research project, and I consent to participating in the research project. I understand that I am at liberty to withdraw from the project at any time, should I so desire.

Signature of Participant Date.....

NOTE: Potential participants should be given time to read, understand and ask questions about the information provided before giving their consent. This should include time out of the presence of the investigator and time to consult with friends and/or family.



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South Africa

Isihloko seProjecti: Cultural ecosystem services: Perceptions and Participatory mapping, A case study of Buffeldraai and Iqadi communities, KwaZulu-Natal

Uyacelwa ukuba ube ingxenye yale saveyi eqonde ukuhlola nokwazisisa imibono eyehlukene yabahlali mayelana nendlela abasebenzisa ngayo imvelo ngokwamasiko endaweni yase Buffeldraai . Uyacelwa ukuba ufunde imibuzo ngokuqaphela ngaphambi kokuba uphendule noma uvume ukuba yingxenye yale saveyi.

Ngabe lungani lolucwaningo: Inhloso yalolucwaningo ukuhlola imibono yabantu basendaweni yase Buffeldraai mayelana nokusebenzisa imvelo ngokwamasiko. Lolucwaningo luzosiza ekuqondosiseni ukuxhumana phakathi kokusetshenziswa kwemvelo nabantu. Lolucwaningo luzophinde lusize ekutheni kufundiswe abantu basemphakathini wase Buffeldraaingokusebenzisa izinsizo/izinzuzo zemvelo ngokucophelela. Loku kuzosiza ekutheni kugcinwe imvelo ngakwenye ingxenye nezimfuno zomphakathi zibe zingancethezekile.

Uzocelwa ukuba: Uma uvuma ukuba ingxenye uzocelwa ukuba ungitshela imibono kanye nemiyalelo yakho mayelana nehloso yaleprojecti. I saveyi izothatha nje imizuzu angamashumi amane kanye nemizuzu eyisihlanu.

Izingozi ne zinzuzo zokuzibandakanya:

Akulindelekile ukuba lolucwaningo luveze izingozi ngaphandle kwaloku okwejwayelekile. Kanti ke futhi akukho zinzuzo ozozithola ngokuzibandakanya, kepha uzozithola nawe usuthola ulwazi ngezinye zezinto okade ungazinakile.

Ukuba ingxenye akuphoqiwe: Ukuba ingxenye yalolucwaningo akuphoqiwe. Ungeke waphendula mibuzo ongathandi ukuyiphendula. Uma uthanda ukweqa eminye imibuzo noma uyeka qobo ukuphendula imibuzo awuzujeziswa.

Igama lakho liyimfihlo: Ngasonke isikhathi uma sekubhalwa kulolucwaningo, igama lakho alizukuvezwa. Kepha uzakubizwa ngeliyimfihlo.

Zonke izimpendulo zakho zizagcinwa: Konke okushilo ngesikhathi sesaveyi kuzagcinwa kuyimfihlo. Ekupheleni kweminyaka emihlanu, konke owake wakusho kuzobe sekulahlwa.

Uma ungaba nemibuzo ungaxhumana no: Dr S. Desai ungamuthola kwi emeyili yakhe ethi Desai@ukzn.ac.za

Istatimende sokuvuma: Mina..... (Amagama aphelele)
ngiyavuma ukuba ngiyaqonda ngakunye okubhalwe lapha kuleli dokodo kanye nenhloso yalolucwaning
futhi ngiyavuma ukuba yingxenye yale projecti. Ngiyaqondisisa ukuthi ngivumelekile
ukungazibandakanyi noma ukuyeka noma nini uma ngifisa

Sayina lapha Usuku.....

QONDA: Abazibandakanya kulolucwaningo kubalulekile ukuba banikezwe isikhathi sokuthi banikezwe
isikhathi zokuba bafunde, baqonde futhi babuze imibuzo ngaphambi kokuzibandakanya. Loku kumele
kwenzeke ngaphandle kokuba khona kwaloyo wangaphandle ukuze abazibandakanyayo bakwazi
ukuxoxa nemindeni kanye nabangani bathole imilayelo.



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Consent Form for Video/Audio Recording

I authorize Hlengiwe Precious Kunene to record my participation and appearance on the video and audio tape for the following project: Cultural ecosystem services: Perceptions and Participatory mapping, A case study of Buffellsdraai and Iqadi communities, KwaZulu-Natal

I acknowledge that I am fully aware of the contents of this release and I understand that this video/audio recording will be used for educational purposes only within the Geography department at the University of KwaZulu-Natal (PMB campus). Furthermore, this recording will be destroyed within one year of filming/recording.

Signature _____ Date _____



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Isivumo soku kuqopha noma ukurekhoda

Ngyamvumela uHlengiwe Precious Kunene ukuba aqophe noma arekhode ukuzibandakanya kwami nokubela kwami kulolulwaningo: Cultural ecosystem services: Perceptions and Participatory mapping, A case study of Buffellsdraai and Iqadi communities KwaZulu-Natal

Ngiyavuma ukuthi ngiyazi ukuthi loku okuqoshiwe naloku okurekhodiwe kuzosetshenziselwa ukufunda ngaphakathi kuphela ohlwini le Geography eUniversity of KwaZulu-Natal (PMB campus). Ngaphezu kwalokho, lomqopho uzokuhlwa lapho kungeke kufinyele khona muntu emva kokuphela kwale projecti.

Isayini _____ Usuku _____

