

**Understanding conflicting outcomes in common property based natural resources
management in South Africa: Comparative analysis of Bela-Bela and Bjatladi
Communal Property Associations**

By

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ABSTRACT

Understanding conflicting outcomes in common property based natural resources management in South Africa: comparative analysis of Bela-Bela and Bjatladi Communal Property Associations

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Using key informant interviews and a detailed household survey, this study compares Bela-Bela and Bjatladi Communal Property Associations (CPAs) across six categories of indicators known to facilitate sustainable collective action in natural resources management: 1. Resource system characteristics, 2. Resource users characteristics, 3. Relationship between characteristics of the resource system and resource users, 4. Institutional arrangements, 5. Relationship between resource system and institutional arrangements, and 6. External environment. The study was implemented in response to conflicting outcomes observed in South Africa's on-going national land reform programme. Bjatladi and Bela-Bela CPAs were purposely selected to reflect outcomes of relative failure and success observed in collective action in land reform projects.

In response to indicator 1, the study established that Bela-Bela CPA performed relatively better than Bjatladi in terms of resource size and predictability of benefits. Bela-Bela CPA has a smaller resource (seven farms measuring between 40 and 4 500ha), while Bjatladi CPA has a large single farm measuring 5 973 ha. Bela-Bela CPA guarantees monthly food packages for its beneficiaries and permanent employment for its employees, while Bjatladi CPA offers beneficiaries income amounting to less than R1 000 every other year and temporary employment for its employees.

In response to indicator 2, Bela-Bela CPA performed relatively better than Bjatladi in terms of size and clarity of resource user group boundaries, appropriate leadership, homogeneity of member interests in sustainable resource management, exit options and levels of poverty. Bela-Bela CPA resource user group is smaller (242 members) relative to Bjatladi (1 200 members). The per cent change in group size due to undefined rules of entry and exit was lower in Bela-Bela CPA (0%) compared to Bjatladi (263%). The percentages of CPA leaders with tertiary level education (Bela-Bela CPA= 45%, Bjatladi CPA= 10%, $U=56.500$, $p=0.011$), professional work experience (Bela-Bela=64%, Bjatladi CPA= 10%, $U=53.000$, $p=0.001$) and presence of a traditional figure in leadership (Bela-Bela CPA=chief present, Bjatladi CPA= none) were higher in Bela-Bela compared to Bjatladi.

i

The percentage of members preferring projects with long-term rather than short-term benefits was higher in Bela-Bela compared to Bjatladi CPA (Bela-Bela CPA=71%, Bjatladi CPA=13%, $\chi^2 = 20.708$, $p=0.000$). Bela-Bela CPA members had fewer exit options (percentage of CPA members living with another employed household member Bela-Bela =33%, Bjatladi =52%, $\chi^2=2.190$, $p=0.139$) and lower levels of poverty compared to Bjatladi CPA members (per cent poor Bela-Bela CPA= 64% and Bjatladi CPA=84%, $\chi^2=3.355$, $p=0.067$).

In response to indicator 3, Bela-Bela CPA performed relatively better than Bjatladi CPA in terms of resource users' levels of dependence on the resources and perception of fairness in benefit-sharing. There was a higher per cent of members from Bela-Bela CPA (82%) compared to Bjatladi CPA (52%) who depended on CPA benefits to cover more than half of monthly household expenses ($\chi^2 = 5.909$, $p=0.015$) and a higher per cent of members from Bela-Bela CPA (79%) compared to Bjatladi CPA (35%) who thought benefit sharing was very fair ($U=283.000$, $p=0.001$).

In response to indicators 4 and 5, there was no difference in the simplicity of rules, accountability of monitors or in matching harvest restrictions to regeneration capacity of the resource across the two CPAs but there was higher level of autonomy in decision making in Bela-Bela compared to Bjatladi CPA. Finally, in response to indicator 6, Bela-Bela performed relatively better than Bjatladi CPA in terms of giving appropriate levels of external aid to compensate local users for conservation activities, and presence of nested levels of organisation. The financial grant given per member in 2003 was higher in Bela-Bela CPA (R90 000) compared to Bjatladi (R5 000). In Bela-Bela there was a clear organisational structure that was divided by enterprise, while in Bjatladi CPA there was no clear organisational structure or division of organisational structure by enterprise.

Following these findings, the study concluded that success of collective action in resources management was favoured by small size of resource, high predictability of benefit flows, small size of resource user groups, well-defined group boundaries, appropriate leadership, homogeneity of interests in sustainable management of resources, fewer exit options, low levels of poverty and high levels of dependence on the resource, high perceptions of fairness in benefit allocation, high levels of autonomy in decision making, appropriate levels of external aid to compensate conservation activities and nested levels of organisation. In order to clearly see the linkages and interrelationships between the different variables and the magnitude of their influence on collective action outcomes, the study recommended that further comparative research be conducted on a larger sample of CPAs.

Key words: sustainable collective action, natural resource management, collective action outcomes, communal property associations, resource system, resource users, institutional arrangements, external environment.



DEDICATION

This work is dedicated to God, my eternal Father for His constant love, motivation, guidance and encouragement throughout my studies. I also dedicate this work to my loving parents; Luke and Sipho Ndlovu and to my husband; Munyaradzi Majoma who have laboured tirelessly and made innumerable sacrifices so that I could achieve my dreams.

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TABLE OF CONTENTS

DEDICATION	iv
ACKNOWLEDGEMENTS	v
LIST OF TABLES	xi
LIST OF FIGURES	xii
ACRONYMS AND ABBREVIATIONS	13
CHAPTER ONE	14
INTRODUCTION AND BACKGROUND.....	14
1.2 PROBLEM STATEMENT.....	16
1.3 OBJECTIVES OF THE STUDY	18
1.3.1 General objective.....	18
1.3.2 Specific objectives.....	18
1.4 RESEARCH QUESTIONS	18
1.5 HYPOTHESES	19
1.6 ORGANISATION OF THE STUDY	19
CHAPTER TWO	20
FACTORS PROMOTING SUCCESSFUL COLLECTIVE ACTION IN NRM AND THE STATUS OF COMMON PROPERTY REGIMES IN SOUTH AFRICAN LAND MANAGEMENT.....	20
2.1 IMPORTANCE OF COMMON PROPERTY REGIMES IN THE MANAGEMENT OF LAND IN SOUTH AFRICA	20
2.1.1 An overview of agricultural characteristics of South Africa’s land.....	20
2.1.2 Patterns of landholding in South Africa	21
2.2 LITERATURE REVIEW ON THE THEORY OF COMMON PROPERTY BASED MANAGEMENT OF NATURAL RESOURCES	25
2.2.1 Origin of the Theory of Common Property Based NRM	25
2.2.2 Defining success in Collective Action Based NRM.....	25
2.2.3 The Theory of Common Property Based NRM and its Shortcomings – A Summary	26
2.2.4 Critical Enabling Conditions of Successful Collective Action in NRM	29
2.3 CONCLUSION	38



CHAPTER THREE	40
STUDY AREA	40
3.1 GENERAL OVERVIEW OF LIMPOPO PROVINCE.....	40
3.1.1 Location.....	40
3.1.2 Climate and vegetation.....	41
3.1.3 Population and socio-economic conditions.....	41
3.1.4 Agricultural economy.....	41
3.1.5 Ownership of farmland.....	42
3.2 BELA-BELA LAND CLAIM	42
3.2.1 Details of compensation	42
3.2.2 Description of properties and current land uses	42
3.2.3 Ownership and management structure of Bela-Bela CPA properties	44
3.2.4 The Bela-Bela CPA community.....	45
3.2.5 Benefits to CPA members	45
3.3 BJATLADI LAND CLAIM	46
3.3.1 Details of compensation	46
3.3.2 Description of land and current uses	46
3.3.3 Ownership and management structure of Bjatladi CPA properties.....	47
3.3.4 The Bjatladi CPA community	48
3.3.5 Benefits to CPA members	49
3.4 CONCLUSION	50
CHAPTER FOUR.....	51
RESEARCH METHODOLOGY.....	51
4.1 COMPARATIVE RESEARCH DESIGN	51
4.1.1 Rationale for comparative research.....	51
4.1.2 Rationale for mixed research methods	52
4.2 SAMPLING PROCEDURE.....	53
4.2.1 Sample size.....	53
4.2.1 Sampling design	54



4.3 DATA COLLECTION METHODS, MATERIALS AND PROCEDURES	55
5.3.1 Key informant interviews.....	56
5.3.2 Survey	57
4.4 DATA ANALYSIS	61
4.4 VARIABLE DESCRIPTION	62
4.7 GENERAL SAMPLE CHARACTERISTICS	69
4.7.1 Sex of respondents	69
4.7.2 Age of the respondents	69
4.7.3 Education profile	69
4.7.4 Employment status, income sources and income levels.....	70
CHAPTER FIVE	72
RESULTS	72
5.1 CHARACTERISTICS OF THE RESOURCE SYSTEM	72
5.1.1 Size of the resource system	72
5.1.2 Resource boundaries	72
5.1.3 Stationarity and storage of resource units	73
5.1.4 Predictability of benefit flows	73
5.1.5 How do resource system characteristics explain conflicting collective action outcomes? .	74
5.2 GROUP CHARACTERISTICS	74
5.2.1 Group size	74
5.2.2 Group boundaries	75
5.2.3 Shared norms.....	75
5.2.4 Past successful experience in collective action (social capital).....	77
5.2.5 Mutual interdependence among members outside collective effort.....	78
5.2.6 Appropriate leadership	79
5.2.7 Social, economic and interest in sustainable management of resource homogeneity	80
5.2.8 Levels of poverty.....	84
5.2.9 Exit options	85
5.2.10 How do resource user characteristics explain conflicting collective action outcomes?....	86

5.3 RELATIONSHIP BETWEEN RESOURCE SYSTEM CHARACTERISTICS AND GROUP CHARACTERISTICS.....	87
5.3.1 Overlap between user group residential location and resource location	87
5.3.2 Level of dependence on the resource	87
5.3.3 Members' perception of fairness in allocation of benefits from the resource	88
5.3.4 How do the relationships between resource users and resource system explain conflicting collective action outcomes?	89
5.4 INSTITUTIONAL ARRANGEMENTS	90
5.4.1 Rules are simple and easy to understand.....	90
5.4.2 Locally devised access and management rules	91
5.4.4 Graduated sanctions	91
5.4.5 Availability of low-cost adjudication	91
5.4.6 Accountability of monitors.....	92
5.4.7 How do the institutional arrangements explain conflicting collective action outcomes? ...	92
5.5 RELATIONSHIP BETWEEN RESOURCE SYSTEM AND INSTITUTIONAL ARRANGEMENTS	93
5.5.1 Restrictions on harvest or extraction match the regeneration capacity of resources.....	93
5.6 EXTERNAL ENVIRONMENT	93
5.6.1 Cost of exclusion technology	93
5.6.2 Time for adaptation to new technologies related to the commons	94
5.6.3 Low levels of articulation with the external market.....	94
5.6.4 Changes in articulation with external markets	94
5.6.5 Central governments should not undermine local authority.....	95
5.6.6 Supportive external sanctioning systems	95
5.6.7 Appropriate levels of external aid to compensate local users for conservation activities ...	95
5.6.8 Nested levels of appropriation, provision, enforcement, governance	96
5.6.9 How does the external environment explain conflicting collective action outcomes?.....	96
5.7 SUMMARY OF RESULTS ON ENABLING CONDITIONS.....	97
CHAPTER SIX.....	99
CONCLUSIONS AND RECOMMENDATIONS	99

6.1 CONCLUSIONS	100
6.2 RECOMMENDATIONS.....	101
LIST OF REFERENCES	103
APPENDICES	i
ANNEXURE 1: KEY INFORMANT QUESTIONNAIRE	i
ANNEXURE 2: INDIVIDUAL QUESTIONNAIRE	i
ANNEXURE 3: DEFINITIONS OF THRESHOLDS OF MODERATE OR SEVERE DEPRIVATION	i

LIST OF TABLES

Table 1: Critical enabling conditions for sustainable governance of common property based natural resource systems	27
Table 2: Socio-demographic characteristics of sample.....	70
Table 3: Number of CPA meetings attended in 2013	76
Table 4: Members' report on other members' commitment to meeting attendance	77
Table 5: Voluntary organisation membership.....	78
Table 6: Demographic characteristics of executive committee	79
Table 7: Members' age, education and employment status.....	81
Table 8: Income classes and ownership of assets	82
Table 9: Time preferences of members for decision making on CPA land, asset and finance use.....	83
Table 10: Statistics on heterogeneity among members	83
Table 11: Poverty rate in Bjaladi and Bela-Bela CPA.....	85
Table 12: Average monthly income class excluding CPA income (2013)	86
Table 13 Contribution of CPA benefits towards monthly household expenses.....	88
Table 14: Members' satisfaction with allocation of CPA benefits	88
Table 15: Test scores on rules of CPA.....	90
Table 16: Summary of enabling conditions in Bjaladi and Bela-Bela CPA	97

LIST OF FIGURES

Figure 1: Map of Limpopo province.....40

ACRONYMS AND ABBREVIATIONS

AgriSETA	Agricultural Sector and Training
ARDC	Agricultural and Rural Development Corporation
CPA	Communal Property Association
CRLR	Commission on the Restitution of Land Rights
DAFF	Department of Agriculture, Forestry and Fisheries
DEAT	Department of Environmental Affairs and Tourism
DLA	Department of Land Affairs
DRDLR	Department of Rural Development and Land Reform
DoA	Department of Agriculture
FAO	Food and Agricultural Organisation
GDP	Gross Domestic Product
IFPRI	International Food Policy Research Institute
KI	Key Informant
LRAD	Land Reform for Agricultural Development
NRM	Natural Resource Management
SLAG	Settlement and Land Acquisition Grant
SSA	Statistics South Africa
ECLAC	Economic Commission for Latin America and the Caribbean
UNICEF	United Nations Children's Fund

CHAPTER ONE

INTRODUCTION AND BACKGROUND

Understanding the collective management of natural resources is still incomplete and continued commitment is required if research is to provide a more comprehensive theory to guide policy decisions. This is important because – apart from playing a central role in ecosystem services such as regulating the climate, air and water quality – millions of people, particularly the poor in the developing world, rely on natural resources and agriculture for their livelihood. According to the World Bank (2015), 70% of the world’s poor living in rural areas rely on agriculture namely forestry, hunting, fisheries and cultivation of crops and livestock production as their main source of income and employment.

Research designed to improve collective action based management of natural resource systems held under common property regimes is particularly important because the common property regime already and increasingly covers a significant extant of the world’s natural resource systems (Ostrom, 1990; Meinzen-Dick and Knox, 1999). First, marshlands, forests, grasslands, and grazing lands are customarily held as common property in many rural areas. Second, since the 1990s, over 0.4 to 0.5 million community-based management groups have been established for the management of watersheds, forests, irrigation systems, wildlife and fisheries among others (Coria and Sterner, 2011). Meinzen-Dick, Raju & Gulati (2002) emphasise that *‘As devolution trends become widespread, affecting the management of vast areas of critical water, land, and forest resources as well as the livelihoods of millions of people, it becomes essential to examine the experience of such programs’* **Common property based NRM** in this study, refers to a situation where a distinct group of individuals with an exclusive right to a natural resource system, develop their own rules to manage that resource, share its benefits and exclude outsiders from exploiting that resource (Ostrom, 1990).

Attention to the sustainable management of land held under common property based arrangements is of central importance in post-apartheid South Africa because these arrangements are a prominent feature of landholding in land linked intricately to the livelihoods of the previously disadvantaged black majority. On one hand, racially discriminative laws passed during the apartheid era forced the black majority into low agricultural potential areas characterised by collective ownership of natural resources. By 1994, the black majority that made up about 75% of the population occupied only 13% of the country’s land in communal lands that were often un-surveyed and managed as common property under the administration of a traditional council (Fourie, 2000).

On the other hand, the land reform programme, particularly its land restitution subprogram has also resulted in the creation of common property regimes over large expanses of prime agricultural land.

According to the Commission on the Restitution of Land Rights (2014), out of the 79 687 land restitution claims lodged by the end of 1998 at the closing date for the submission of claims, 77 334 of these claims were settled by end of March 2013. Although only 8% (6 042) of the settled claims opted for their land to be returned to them, while the rest opted for financial compensation, the land restored to land claimants covered over 1.5 million hectares of mostly highly developed commercial farmland. It is this extension of common property based arrangements over prime commercial agricultural land that makes research designed to understand collective action in natural resource management more important than ever.

Commercial agriculture contributed about 80% of the nation's total agricultural output and provided employment to about 820 000 people (SSA, 2012b; DAFF, 2013). However, it has become evident that collective action based NRM in the post-settlement land reform phase in South Africa has not been automatically successful, thus, posing a threat to the long-term sustainability of the commercial agricultural sector (Lahiff, 2007a; Lahiff, Davis and Manenzhe, 2012; DRDLR, 2012). It is therefore, imperative that policy makers, the resource users and non-governmental organisations work together to identify and find sustainable solutions to the problems experienced in collective management of land reform projects in the post-settlement phase. This is because well-functioning land reform groups are more likely to be in production for longer, produce longer lasting benefits for its beneficiaries and for the economy as a whole and thus make the land reform programme more successful.

This study focused on the land restitution leg of the land reform programme. Land restitution involves the return of land rights or compensation for land dispossessed after 19 June 1913 due to past racially discriminatory laws or practices (Restitution of Land Rights Act, 1994). Where group claims to land were concerned, claimants could choose between two types of legal entities by which they could acquire, hold and manage land communally, namely a Communal Property Association (CPA) or a Trust. A Trust vested the ownership of land vests in trustees - usually non-beneficiaries, therefore taking away the power of the claimants in decision making regarding their land. In a CPA on the other hand, ownership of land vests in the members of the claimant group as co-owners of the property (DLA, 1997; Trust Property Control Act, 1988; CPA Act, 1996).

The transfer of highly valuable commercial land to claimant groups under the land restitution programme is based on a number of conditions. Firstly, beneficiaries will not subdivide the land and will continue using the land for commercial agricultural purposes. Secondly, the CPA or Trust will enter into a strategic partnership with a strategic partner- an experienced farmer, who will invest working capital and manage farm operations for a minimum of ten years until the CPA is ready to take over the management of the land fully. In return, the strategic partner will get a share of the profits while the CPA or Trust would get rentals, employment, training opportunities and a share of the profits. Lastly, beneficiaries would not sell the land.

1.2 PROBLEM STATEMENT

The co-ownership and co-management of land by CPA members in land restitution claims has been widely criticized for its inherent assumption that beneficiaries are willing and able to work together and that they share common interests for land use. According to Lahiff et al (2012), ‘the question on how a large heterogeneous community can manage large complex commercial farms effectively still remains to be answered.’

According to literature (Wade, 1988; Ostrom, 1990; Baland and Platteau, 1996), the challenge for individuals in a collective group is to ensure that they overcome the temptation to free ride, shirk or otherwise act opportunistically and thus ensure that they enjoy the continual joint benefits from the resource over extended periods. In the case of land restitution beneficiaries organised as CPAs in South Africa, success in overcoming these challenges is not universal. In fact, the general perception is that the collective management of land in the land restitution model has failed dismally with the majority of these projects having either failed from the start, disintegrated over time or currently struggling. Studies also cite different reasons for the failure and collapse of land restitution projects. According to studies done by Lahiff (2007a) and Lahiff et al (2012), the majority of the groups had disintegrated due to internal fights amongst beneficiaries regarding the use of land and benefit sharing. In other groups, the executive committees had sold the restored land without the knowledge of its group members or, because of the failure to realise benefits, group members decided to settle on and subdivide the restored land even though this was against the conditions set by the government regarding restored land. Still in other groups, power struggles between the group and their strategic partners have made collective action difficult and threaten to halt production.

Apart from these challenges, the DRDLR (2010 & 2012) reported that the majority of groups had also failed to comply with government regulations to hand in a financial report and minutes of their annual general meetings at the end of every year. Furthermore, the majority of projects have also failed to generate the intended stream of benefits such as a sustainable flow of cash income, employment or skills development (Lahiff, 2007a; Lahiff et al, 2012).

To date, only a few groups have managed to overcome internal differences and maintain a cohesive group, maintain good relations with its strategic partner, adhere to government regulations, and generate reasonable and sustainable tangible benefits such as cash income, employment or skills development as intended for land restitution projects (Lahiff, 2007a; Lahiff et al, 2012; DRDLR, 2012).

Literature on common property based NRM (Ostrom, 1990; Wade, 1988a; Baland and Platteau, 1996) has shown that the success of collective action in the management of natural resources is influenced by:

- The characteristics of resources,
- The nature of groups that depend on resources,
- Particulars of institutional regimes by which resources are managed, and
- The nature of the relationship between a group and external forces and authorities, such as markets, the state, and technology (Agrawal, 2002).

To date, literature has identified about thirty-three critical enabling conditions for successful collective action in NRM (Agrawal, 2002). Scholars (Agrawal, 2002; Poteete and Ostrom, 2004b; Agrawal and Chhatre, 2006) note that beyond identifying these critical enabling factors, the current theory of collective action fails to adequately predict the direction and magnitude of influence of some variables such as social and economic heterogeneity, group size and levels of poverty, and does not show the relevant contribution of the multiple variables identified in the theory.

Agrawal (2002) notes that in order to develop the theory further, research needs to identify contingent relationships and possible causal chains between these variables. While this can be done using comparative and large N-studies, the existing pool of case studies on collective action based natural resource management has many methodological shortcomings. Some researchers have paid very little attention to some important variables such as the resource system characteristics and the external environment, and as a result, existing case studies may be off-course regarding the causal influences that they have ignored, hence conclusions made from these cases may not be accurate (Agrawal, 2002; Agrawal and Chhatre, 2006; Edwards and Steins, 1999). In addition, the development of the theory has been limited by researchers' use of success stories only (Meinzen-Dick and Knox, 1999).

In order for a more comprehensive understanding of factors known to facilitate successful collective action in NRM to be developed, literature recommends that research moves from isolated case studies to robust comparative case studies that take into account as many of the critical enabling conditions already identified in the theory of collective action in NRM, and moves from theoretical to empirical research focusing on both successful and failed collective action stories in NRM (Meinzen-Dick et al 2002; Agrawal, 2001; Poteete and Ostrom, 2004b).

It is in light of this view, that this study identified two communities, Bela-Bela CPA and Bjatladi CPA that are both managing land under common-property based arrangements awarded through the land restitution in 2003, but were currently experiencing different collective action outcomes. Collective action appeared to be successful in Bela-Bela CPA, while it appeared to be less successful in Bjatladi CPA. This study sought to conduct a robust comparative analysis of enabling conditions in Bela-Bela

CPA and Bجاتلادي CPA by comparing the entire set of enabling conditions identified in the theory of collective action across the two CPAs. The results may help policy makers to identify and provide possible solutions to the challenges faced by CPAs in developing sustainable collective action.

1.3 OBJECTIVES OF THE STUDY

1.3.1 General objective

The main objective of this study was to use the theory of sustainable collective action in the management of natural resources to understand and explain similarities and differences in the outcomes observed in Bela-Bela and Bجاتلادي CPAs, with the view to generate information that can inform policies that facilitate sustainable collective action in the management of CPAs in South Africa.

Consequently, this study was guided by the following sub-objectives:

1.3.2 Specific objectives

1. To generate empirical understanding of the extent to which the variables that are known to facilitate sustainable collective action in the management of natural resources could be used to explain the outcomes that currently obtain in the Bela-Bela CPA.
2. To generate empirical understanding of the extent to which the variables that are known to facilitate sustainable collective action in the management of natural resources could be used to explain the outcomes that currently obtain in the Bجاتلادي CPA.
3. To compare and contrast the availability of enabling conditions in the two CPAs so as to guide policy choices on sustainable collective action in the management of CPAs in South Africa.

1.4 RESEARCH QUESTIONS

The following research questions guided this study:

1. To what extent do the variables known to facilitate sustainable collective action in the management of natural resources explain the outcomes that currently obtain in the Bجاتلادي CPA?
2. To what extent do the variables known to facilitate sustainable collective action in the management of natural resources explain the outcomes that currently obtain in the Bela-Bela CPA?

3. To what extent can the differences and similarities in variables known to facilitate sustainable collective action in the management of natural resources explain the difference in collective action outcomes currently observed in the two CPAs?

1.5 HYPOTHESES

1. The variables known to facilitate sustainable collective action in the management of natural resources are more favourable in Bela-Bela CPA compared to Bjatladi CPA?
2. The differences in variables known to facilitate sustainable collective action in the management of natural resources can be used to explain the different collective action outcomes currently observed in Bela-Bela and Bjatladi CPA?

1.6 ORGANISATION OF THE STUDY

This dissertation comprises six chapters. Chapter One introduced the topic of study. Chapter Two will discuss the status of the common property regime in land ownership in South Africa and present a theoretical review of literature on the theory of common property based natural resource management. Chapter Three presents an outline of the research methodology. The results are presented and discussed in Chapter Four and, lastly, Chapter Five presents a summary of the study, key conclusions and recommendations for future study.

CHAPTER TWO

FACTORS PROMOTING SUCCESSFUL COLLECTIVE ACTION IN NRM AND THE STATUS OF COMMON PROPERTY REGIMES IN SOUTH AFRICAN LAND MANAGEMENT

Collective management of natural resources is not a new phenomenon, but research is yet to provide a comprehensive theory which can adequately explain and predict when resource users are likely to self-organise over extended periods and when they are not (Agrawal, 2001; Agrawal and Chhatre, 2006). The aim of this chapter is to demonstrate the importance of and challenges faced in collective management of South Africa's land, and to present a review of literature on the theory of common property based natural resource management.

2.1 IMPORTANCE OF COMMON PROPERTY REGIMES IN THE MANAGEMENT OF LAND IN SOUTH AFRICA

2.1.1 An overview of agricultural characteristics of South Africa's land

While South Africa covers a large land surface area of approximately 1.22 million square kilometres, only 12% of this total land area is suitable for the production of rain-fed crops and only 3% considered high-potential arable land. A further 1.2% of the country's land area is suitable for irrigation, however reports indicate that irrigation is already being practised on a further 1.3 million hectares across the country (DGCIS, 2013), and thus there is no more irrigable land left for the expansion of irrigation activities. In addition, water scarcity also threatens the viability of irrigation agriculture in the long term (WWF, 2010). Most of the country's total land area (69%) is suitable for grazing, and therefore livestock farming is by far the largest agricultural sector in the country (DGCIS, 2013). However, the viability of the country's livestock sector is threatened by the loss of grazing land evident across the country in areas of high rates of urbanisation, such as Gauteng and the Western Cape and in the communal areas of Limpopo, KwaZulu-Natal and the Eastern Cape (Hoffman & Todd, 2000).

Regardless of the unsuitability of land and numerous constraints, agriculture is still a major land use activity in South Africa. Of the country's total land surface area, 81% is used for agricultural production. Of this, 83% is used for grazing, 17% for cultivation of cash crops while about 2% is used for forestry and 12% is reserved for conservation (DoA, 2007). Overall, agriculture contributes about 3% to the country's gross domestic product (GDP) and provides employment and income to about 8.5 million people (DGCIS, 2013).

2.1.2 Patterns of landholding in South Africa

From the 1900s till the advent of constitutional democracy in 1994, racially discriminative laws such as the Natives Land Act 27 of 1913 and the 1936 Trust and Land Act 18 saw the black majority dispossessed of their land, land rights and rights to access land in favour of the white minority through the forced removal of the black majority from land designated for white settlement to homelands, also known Bantustans, created for black resettlement. This resulted in a landholding system characterised by two distinct and contrasting forms of tenure, agricultural potential and access to resources divided along racial lines (Fourie, 2000). By 1994, 87% of the country's land was in the hands of the white minority while the black majority which made up about 75% of the population occupied only 13% of the country's land.

Bantustans were typically located in hilly areas or areas with low agricultural potential in the country's rural areas. Land was neither surveyed nor titled and was managed as common property under the administration of a traditional council. Land was used mainly for the purposes of accommodation and farming, so each family was allocated a plot while the rest of the land was shared for common use. Due to the high population volumes, Bantustans were overcrowded, and the size of allocated plots was small (Fourie, 2000).

The forms of tenure used in Bantustans were both weak and insecure (Fourie, 2000). They included customary rights, permission to occupy, and 99-year leases that could be revoked as a result of politically unacceptable behaviour. As a result, the Bantustan population had no access to credit or extension services and was therefore limited to small-scale production for either consumption or sale at their local market. In addition, black Africans were not allowed to own or occupy land in urban areas. Overall, the apartheid system forced the black majority into underdeveloped, overcrowded, common property based rural areas with limited potential to generate their subsistence needs.

The white minority, on the other hand, settled on highly productive rural farmland situated outside the borders of homelands. The land was surveyed, subdivided into large farms and characterised by exclusive rights titled as freehold. Owners were granted access to credit and extension services to support production resulting in a well-developed large-scale commercial farming sector (Fourie, 2000).

The DRDLR Land Audit (2013c) revealed that 78% of the country's land is private land owned mostly by private individuals, companies and trusts, while the other 22% belongs to the state. A further breakdown of landholding patterns also reveals that land ownership in South Africa is still racially skewed; with major differences in the size of holdings, tenure and agricultural production

conducted by the white minority and black majority. Sixty-seven per cent of the country's land consists of about 40 000 units of commercial white-owned agricultural land held as private land, while only 15% consists of black communal land held under various forms of customary tenure, and mostly owned by the state. Ten per cent is other state land, such as schools, hospitals, military grounds, prisons and conservation areas, while the other 8% consists of urban areas.

The white-owned commercial farming sector contributes most of the national agricultural produce (80%) and is a major source of employment for up to 821 967 (SSA, 2012b; DAFF,2013). However, employment in this sector declined by 5,1% from 866 455 employees in 2010 to 821 967 employees in 2011. There were also decreases in 'full-time' and 'casual and seasonal' employees of 6,0% and 4, 2% respectively in the same period.

On the other hand, almost half (43%) of the country's population reside in communal areas, leading to overcrowding and congestion (DGCIS, 2013). People in communal areas produce crops and livestock primarily for subsistence purposes or for sale in local markets and rely on natural resources for a living (Hoffman and Todd, 2000, Shackleton, Shackleton & Cousins, 2000; Shackleton & Shackleton, 2012 &, 2000). Although the overall contribution of communal areas to national agricultural production is less than 20%, the contribution to livestock production is very high. About 59% of the 14.1 million herd of cattle are owned by communal farmers and of the 8 000 commercial sheep farms found in the country, 5 800 of these (72.5%) belong to communal farmers. The grasslands upon which communal areas are located are the major source of pasture for the livestock they keep. Unlike the crop fields in the communal areas, which are divided into individual plots and managed by individual households, the grazing land is shared and managed by whole communities. In 2012, this small-holder sector found in the communal areas provided employment for almost 1.3 million people, but its viability in the long-term is threatened by the high rates of soil and water degradation experienced in communal rangelands, croplands and settlements (DGCIS, 2013; WWF, 2010; Hoffman and Ashwell, 2001).

Communal populations also derive a significant proportion of their livelihood from the wild natural resources in their vicinity. According to Shackleton & Shackleton (2012), in South Africa's rural communities, wild resources account for 15 to 25 per cent of total household income on average and constitute even greater proportions of up to 40 % in poorer and more vulnerable households. They also found that wild resources constitute a higher proportion of household income than livestock and cropping production activities combined. The main activities linked to wild resources include collection of firewood, construction wood, wild fruit, herbs, edible plants and insects, medicines and fodder for either own household consumption or for sale as a primary or supplementary source of income (Shackleton & Shackleton, 2012; Makhado, Von Maltitz, Potgieter & Wessels, 2009). The resources are held in common property as these wild natural resources are free and accessible to all

members of the community. Given the importance of these collectively owned wild natural resources to rural livelihoods, it is especially important to ensure that these natural resources are managed sustainably so that they can benefit rural people for longer.

To correct the racial imbalance in landholding, at the adoption of a democratic constitution in 1994, the South African government embarked on a massive land reform programme. In addition to providing justice to previously disadvantaged persons, land reform also aims to reduce poverty and address food insecurity and to foster economic growth and rural development (DLA, 1997). It is guided by three sub-programmes, namely tenure reform, land redistribution and land restitution.

Tenure reform aims to strengthen the rights of all landowners, whose land rights were weakened during the apartheid era, by bringing all landowners under a legal tenure system. It targets mostly those living in the rural areas or in former homelands. Land redistribution, on the other hand, enables equitable access to land by providing previously disadvantaged individuals or households with grants for the purchase of land on the open market. Lastly, land restitution restores the land rights or compensates for the loss of such rights to individuals or communities due to previously discriminative laws enacted after the 1913 Natives Land Act.

The land redistribution programme, on the other hand, has also introduced a form of collective ownership of land. Land redistribution was implemented in two phases. From 1995 to 1999, previously disadvantaged poor ‘households’ with an average income of less than R1 500 could access R16 000 loans through the Settlement and Land Acquisition Grant (SLAG) scheme. Applicants would then pool their resources together for the purchase of land in groups. In general, the SLAG scheme was a failure and this was blamed on the collective nature of land ownership and lack of skills and resources on the part of the beneficiaries (Lahiff and Li, 2012). As a result, the SLAG programme was terminated in 1999 and replaced by the Land Reform and Agricultural Development (LRAD) programme in 2000.

In the LRAD programme, the income ceiling was removed, allowing any previously disadvantaged individual or households to access much higher loans for the purchase of commercial farmland. However, the nature and size of grants in the land redistribution programme still compels beneficiaries into communal ownership of land. In this phase, however, family members rather than households can pool their resources to buy family rather than group-owned farms. According to the DRDLR Annual report (2014), about 5 000 farms covering a total of 4.2 million hectares had been transferred to over 200 000 families.

In both the land restitution and redistribution programmes, beneficiaries who agreed to hold land communally can choose between a Trust and a CPA as the legal entity by which they would hold their land. This entity is necessary for registration of land rights and tenure security and outlines the rights

and responsibilities of its members and the rules by which their property is governed. According to the DRDLR (2010), beneficiaries are often encouraged to choose CPAs as they are easier to manage. By 2014, about 976 CPAs, covering 264 608 members, were registered in both the land restitution and redistribution programmes and owned about 3 559 664 hectares of land (DRDLR, 2014).

Of the three sub-programmes, land restitution is constantly under scrutiny because a high volume of claims, mostly by communities, have been laid on large tracts of high-value commercial farmland which already supplies a greater part of the nation's food, exports and employment. By the end of 1998, at the closing date for the submission of claims, 79 687 land claims had been lodged. By the end of March 2013, 97% (77 334) of these claims had been settled. Of these, only 8% (6 042) were settled through land restoration while the rest of the claimants preferred financial compensation. In total, the government had transferred a total of 1.5 million hectares of land, consisting of mostly large tracts of commercial farmland, to mostly families and communities ranging from as few as five members to thousands per claim (CRLR, 2014).

Apart from encouraging common property based ownership, the land restitution model also enforces collective management of restored land. Beneficiaries are not given individual rights to land, but instead beneficiaries become co-owners of the land through a single legal entity- either a Trust or CPA. The transfer of restored land is done on condition that, the Trust or CPA forms a partnership with a strategic partner and the land is then managed through a joint company with the strategic partner and the land restitution beneficiaries as shareholders. The strategic partner- an experienced farmer would invest capital, technical expertise, market linkages, and in turn get a share of the profits. The beneficiaries would get a share of the profits, rentals for its land, training opportunities, skills development and employment opportunities if these arose.

The dismal performance of collectively owned land reform projects appears to be the norm rather than the exception in both the land redistribution and restitution sub-programmes. Groups are often in conflict, thus fail to make production decisions, reducing the ability of the land reform to create employment, improve food security, reduce poverty, and improve the livelihoods of its beneficiaries (Lahiff, 2007a; Lahiff et al, 2012). The majority of projects were in severe distress due to power struggles between the groups and their strategic partners. These power struggles threatened to bring production to a halt. In addition, the majority of CPAs were still failing to comply with government regulations to submit annual financial statements and hold annual general meetings each year (DRDLR, 2010 & 2012). Furthermore, Lahiff et al (2012) noted that some projects had failed to generate the intended benefits of income, employment or skills development for its members. Given the dismal performance of land reform projects held under common property regimes in land restitution and their link to the livelihoods of millions of South African families and national food security, GDP and exports, it is imperative that resource users, policy makers and non-governmental

organisations work together to find solutions to the challenges faced by CPAs across the country. Because of the occurrence of land restitution claims on highly productive land and the precondition of non-subdivision of land and co-management of commercial farming projects that enforces collective management of restored land, this study focused on collective action in South African land restitution projects.

2.2 LITERATURE REVIEW ON THE THEORY OF COMMON PROPERTY BASED MANAGEMENT OF NATURAL RESOURCES

This section will provide an overview of the current state of knowledge and the significant gaps and shortcomings of this theory. The first subsection presents the current state of knowledge on the theory of collective action as a whole, its shortcomings and significant research gaps. The second subsection presents a review of related studies on each factor known to facilitate collective action in natural resource management.

2.2.1 Origin of the Theory of Common Property Based NRM

Interest in common property based natural resource management or the commons dates back to Hardin's (1968) conclusion that, without the intervention of the state or private tenure, resource users were not capable of managing a resource on their own as they were compelled to pursue their own immediate self-interests at the expense of the long-term sustainability of the resource. Hardin likens all commons to an imaginary pasture that is open to all. With no barriers to entry or exit and no rules regarding the use of the pasture, resource users are compelled to use as much of the resource as they can, by adding as many extra units of livestock as they can, because they know that if they do not add that extra unit of livestock, someone else will. Thus, Hardin concluded that in the hands of resource users, the tragedy of the commons was unavoidable and thus, fisheries, forests and national parks that were free for all were destined for collapse. However, there was a growing library of researchers (Wade, 1988; Ostrom, 1990; Baland & Platteau, 1996) to prove that the tragedy of the commons was avoidable. The focus of the research shifted from demonstrating the tragedy of the commons to identifying the circumstances under which common property based management of natural resources was sustainable or not.

2.2.2 Defining success in Collective Action Based NRM

According to Ostrom (1990), collective action is successful when the resource, resource users and the institutions governing them have survived over long periods. Consequently, researchers have developed various indexes based on either one or a combination of the performances of the resource, resource users and/or the institutions (Andersson & Agrawal, 2011). Andersson and Agrawal (2011)

examined the relationship between socio-economic inequality and collective action in 228 forests in various developing countries. They developed a 'collective action index' that took into account a combination of six different variables: (1) the relative condition of the resource, (2) resource users' ability to organise forest conservation activities, (3) create rules for management, (4) undertake forest improvement activities, (5) maintain records of rule violations and sanctions and (6) enforce rules to ensure sustainable forest use.

Adhikari and Lovett (2006) examined the relationship between heterogeneity and performance of forest user groups in eight community-managed forests in Nepal. In their index of collective action, 'collective action' was low if forest users were aware of degradation of the resource, but users had not devised any formal rules to regulate extraction of the resource. Collective action was moderate if there were some kind of formal rules regulating harvest and access to the resource with a minimal level of forest development activities, but low levels of monitoring of those who violate rules and regulations. A high level of collective action was present when a group of resource users had devised harvesting and access rules, monitoring by members and organised forest-related group activities such as meetings. This index took into consideration direct measures of collective action such as the frequency of meetings, hiring of security guards and the number of violations.'

Gibson and Koontz (1998) also examined the influence of values on collective action in two forests under community-based management in Southern Indiana. To them, the outcomes of collective action depended on the overall forest conditions and benefits available to the community members, and commitment to preserving nature and gains from the forest. Agrawal and Goyal (2001) examined the relationship between group size and collective action in 28 forest councils in the Himalayan tracts of India's Kumaon region. They measured collective action in terms of the number of meetings, the total protection budget, and per capita contributions. They highlighted that some other variables that could be used to measure collective action were the condition of the forest and income earned from forest products.

2.2.3 The Theory of Common Property Based NRM and its Shortcomings – A Summary

Agrawal (2002) summarises the current state of knowledge regarding the theory of common property based management of natural resources. This theory has only advanced as far as identifying a list of critical factors that enable success in collective action: presented in Table 1 (Agrawal, 2002; Agrawal and Chhatre; 2006). To consolidate this list of critical enabling factors for successful collective action in NRM, Agrawal (2002) combined findings from three extensive book-long studies by Wade (1988), Ostrom (1990), Baland and Platteau (1996). Agrawal also added factors such as the stationarity and storage of a resource and predictability of resource flows from other findings such as Schagler, Blomquist & Tang (1994).

Table 1: Critical enabling conditions for sustainable governance of common property based natural resource systems

(1) Resource system characteristics
(i) Small size (RW)
(ii) Well-defined boundaries (RW, EO)
(iii) Low levels of mobility
(iv) Possibilities of storage of benefits from the resource
(v) Predictability
(2) Group characteristics
(i) Small size (RW, B&P)
(ii) Clearly defined boundaries (RW, EO)
(iii) Shared norms (B&P)
(iv) Past successful experiences—social capital (RW, B&P)
(v) Appropriate leadership—young, familiar with changing external environments, connected to local traditional elite (B&P)
(vi) Interdependence among group members (RW, B&P)
(vii) Heterogeneity of endowments, homogeneity of identities and interests (B&P)
(viii) Low levels of poverty
(1 and 2) Relationship between resource system characteristics and group characteristics
(i) Overlap between user group residential location and resource location (RW, B&P)
(ii) High levels of dependence by group members on resource system (RW)
(iii) Fairness in allocation of benefits from common resources (B&P)
(iv) Low levels of user demand
(v) Gradual change in levels of demand
(3) Institutional arrangements
(i) Rules are simple and easy to understand (B&P)
(ii) Locally devised access and management rules (RW, EO, B&P)
(iii) Ease in enforcement of rules (RW, EO, B&P)
(iv) Graduated sanctions (RW, EO)
(v) Availability of low-cost adjudication (EO)
(vi) Accountability of monitors and other officials to users (EO, B&P)
(1 and 3) Relationship between resource system and institutional arrangements
(i) Match restrictions on harvests to regeneration of resources (RW,EO)
(4) External environment
(i) Technology:
(a) Low-cost exclusion technology (RW)
(b) Time for adaptation to new technologies related to the commons
(ii) Low levels of articulation with external markets
(iii) Gradual change in articulation with external markets
(iv) State:
(a) Central governments should not undermine local authority (RW, EO)
(b) Supportive external sanctioning institutions (B&P)
(c) Appropriate levels of external aid to compensate local users for conservation activities (B&P)
(d) Nested levels of appropriation, provision, enforcement, governance (EO)

Key: EO – Ostrom; E (1990); RW – Wade, R (1988a); B&P – Baland and Platteau (1996)

However, Agrawal highlights that, in order to develop the theory further, research needs to identify contingent relationships and possible causal chains that exist between the known variables. In addition, there is a need to clarify the direction of influence of some variables such as heterogeneity, group size and levels of poverty (Agrawal, 2001; Agrawal and Chhatre, 2006). Although a large number of case studies from which theory can learn about these relationships and causal influences already exist, there are two major constraints to the use of these cases. First, existing studies designed to understand the factors affecting collective action paid little attention to the characteristics of the resource such as stationarity, storage and predictability and the influence of the external environment. As a result, existing research may be off-course regarding the causal influences of and relationships between the different variables identified (Agrawal, 2001; Agrawal and Chhatre, 2006; Edwards and Steins, 2010). Second, there is disagreement over the direction of influence of variables such as heterogeneity, group size and levels of poverty (Agrawal, 2001; Agrawal and Chhatre, 2006).

In order to overcome these two obstacles to the development of a comprehensive theory of common property based natural resource management, the first step would be to generate a database of robust case studies that measure all the variables known to facilitate collective action. According to Agrawal and Chhatre (2006), in-depth case studies could aid researchers to understand the seemingly conflicting results about the size and direction of influence of variables such as heterogeneity, group size and levels of poverty. The second step would be to use these in-depth case studies to conduct either comparative or large N-studies to get information that is more accurate on the influence of the external environment, the physical characteristics of the resource and to identify the contingent relationships and possible causal chains (Meinzen-Dick and Knox, 1999).

By using the comprehensive list of enabling conditions gathered by Agrawal (2001) to conduct a comparative analysis of two CPAs in Limpopo, South Africa, this study sought to contribute towards a better understanding of the influence of the physical characteristics of the resource and the external environment, together with all other known variables, on collective action in natural resource management. Such an approach produces more robust results than a study that looks only at a few variables.

The following section presents the current state of knowledge and research gaps regarding each of the factors known to influence sustainable collective action in NRM. Here, each section begins with a definition of each of the critical enabling conditions that fall under the subtopic, followed by a description of how they influence collective action, and ends with the findings of different authors related to that section.

In this study, the term **resource system** refers to entities that produce the benefits that people extract and use for their own utility, and the benefits extracted from these entities are referred to as **resource**

units. Examples of resource systems are forests, fisheries, oceans and grazing areas, and examples of resource units are firewood, fish, and fodder from the above resource systems (Ostrom, 1990; Schagler et al, 1994).

2.2.4 Critical Enabling Conditions of Successful Collective Action in NRM

a) Resource system characteristics

Resource system characteristics refer to both the physical characteristics of a resource system such as its size and the clarity of its boundaries and characteristics of the resource units themselves such as the level of mobility. These characteristics are crucial in that they may either create a favourable environment in which collective efforts can be pursued, or one in which managing collective efforts will be difficult. They determine the extent to which common property regimes can be exercised, have an influence on transaction and information costs, the type of rules that can be used to govern a resource system and the feasibility of self-governing the resource as a collective unit (Ostrom, 1990; Schlager et al, 1994; Nugent and Sanchez, 1998; Imperial and Yandle, 2005). If institutions are to be successful, they must fit the physical character of the resource (Nugent and Sanchez, 1998; Ostrom Chang & Tarko, 2012). Therefore, it is important to understand the physical conditions under which collective action is feasible (Schlager et al, 1994).

The physical characteristics of a resource that have an influence on sustainability of common property governance over common pool resources are: the size of the resource, the presence of well-defined boundaries, levels of mobility or degree of stationarity of the resource units, possibilities of storage of benefits from a resource and predictability of the flow of benefits from the resource.

i. Size of the resource system

The smaller the size of a resource system the easier it is for a group of users to manage it collectively (Wade, 1988; Ostrom, 1990). This is because within smaller resource systems, it is easier to observe and measure the activities of resource users and to monitor the state of a resource itself, than to do so within larger resource systems. Although research has not agreed on what constitutes a small, medium or large sized resource, institutions that are used in smaller resource systems have been found to be more effective and durable compared to institutions used in larger resource systems (Wade, 1988; and Mushtaq, Dawe, Lin & Moya, 2007). According to Meinzen-Dick and Knox (1999), ‘the size of the resource system must be too large for one individual to manage on their own, but not too large for monitoring by a group of resource users to be difficult.’

ii. Boundaries of the resource system

A resource system with clearly defined boundaries is easier to manage collectively than one in which boundaries are not clear. Well-defined boundaries are important because they delineate the territory which is being protected by the collective group, and therefore outlining the area that the resource users own and from which they will exclude outsiders (Wade, 1988a; Ostrom, 1990; Baland and Platteau, 1996; Tucker, 1999). Boundaries also enhance the ability to monitor the actions of other group members and the ease with which resource users can identify actions of cheating or rule breaking (Wade, 1988a).

iii. Stationarity and storage

Stationarity refers to the degree to which resource units are mobile in space while **storage** refers to the presence or absence of a bank or store of unharnessed resource units. Schagler et al (1994) stressed that these two physical characteristics have an influence on the opportunities and constraints that users face in attempting to resolve collective action problems, making some strategy choices more likely than others. Their findings showed that when resource units are either immobile or when they can be stored, resource users are more likely to find it easier to predict flows from the resource system, and directly capture benefits from restricting one's access to the resource or from engaging in activities aimed at improving the resource. Thus, they are more likely to engage in collective action.

On the other hand, when resource units are mobile or where storage is absent, it is costly to gather good quality information regarding the quality and quantity of resource flows available, and it is not possible to capture the individual benefits gained by restraining one's use of the resource. Users in these types of resource systems do not have the capacity to manage the flows of the resource or to engage in activities that improve the resource on their own and thus voluntary collective efforts are less likely to succeed.

iv. Predictability of resource benefit flows

This refers to the extent to which resource users can make a futuristic guess regarding the quantity and quality of resource units that a resource system will produce. Collective action is more successful in resource systems where users are able to predict the flows of benefits compared to resource systems where flows are unpredictable.

Unpredictability increases the cost of monitoring and enforcing rules since it encourages opportunistic behaviour and creates conflicts among users. Studies conducted in irrigation systems show that, where farmers know the quantities and the time that they will receive water, there was less conflict and opportunistic behaviour than in resource systems where the quantity and time of water release were unknown (Wade, 1988b).

v. Group characteristics

While the characteristics of the resource system may provide an enabling environment for resource users to come together and devise effective rules for the governance of their resource system, this does not guarantee that resource users will participate in a collective effort (Ostrom, 1990; Meinzen-Dick et al, 2002). Some groups are better able to organise themselves and to devise more effective rules than other groups (Meinzen-Dick et al, 2002; Jones, 2004, Muchapondwa, undated; Agrawal and Chhatre, 2006; Lahiff, 2007a; Araral, 2009).

Group characteristics include the size, boundaries, past successful experiences, leadership, interdependence, homogeneity and shared norms within the group. Group characteristics affect the interactions of the different resource users regarding collective effort, particularly the transaction costs required to bargain, monitor and enforce rules (Agrawal and Gibson, 1999; Adhikari, 2001). An increase in these transaction costs lowers the likelihood of collective action.

vi. Size of resource user group

Theoretically, group size is expected to be negatively correlated to collective action for two main reasons (Ostrom, 1990; Wade, 1988a). Firstly, because the smaller the group size, the more frequent the interactions between members and thus the greater the level of trust and effect of reputation as a sanctioning mechanism than in larger groups. Secondly, because the degree of heterogeneity of interests is likely to increase with group size, thus making coordination among members more difficult. However, scholars have shown that the relationship is not as straightforward as was previously asserted. In addition, there is no consensus on what constitutes a small or large group, and the extent to which the assessment of group size should depend on the context (Poteete and Ostrom, 2004a).

Poteete and Ostrom (2004a) evaluated the findings from six different International Food Policy Research Institute (IFPRI) studies regarding the influence of group size and homogeneity on collective action outcomes in forest management. From their findings, Poteete and Ostrom (2004a) found that heterogeneity of interests does not necessarily increase with group size and neither is there a consistent negative relationship between group size and collective action. One of the reasons for this could be that, while smaller groups enjoyed the benefits of frequent interaction in building trust, they faced even greater challenges of gathering the necessary human and financial capital required for effective collective action than larger groups.

Gautum (2007) also examined the role of group size and heterogeneity on the forest condition in eight forest user groups in Nepal, and found that there was no consistent relationship between the

group size or heterogeneity and forest condition. He concluded that the different forest condition must emanate from differences other than these two variables.

Nagendra (2007) also examined the role of group size on change in forest density and found that there was a curvilinear relationship between forest user group size and reforestation. From her findings, Nagendra (2007) concluded that collective action was more likely to succeed in moderately sized groups. Fewer resource users meant that critical tasks and resource mobilisation could not be done effectively, while too many resource users also meant that coordinating tasks and cooperation were more difficult.

vii. Boundaries of the resource user group

The role of clearly defined boundaries of a resource user group in collective action outcomes is well documented in literature. If there exists a well-delineated group of users who are distinct from persons excluded from the resource, this increases the chances of collective action succeeding. The boundaries differentiate between individuals who have a right to use the resource and individuals who do not have a right to use a resource. Such boundaries increase the ability to notice any free riders or outsiders and they increase the confidence of resource users that no outsiders will reap the benefits from their investments in improving the resource or from reducing their level of resource use (Wade, 1988a; Ostrom, 1990; Meinzen-Dick and Knox, 1999; Tucker, 1999).

viii. Shared norms among resource users

A norm is an individual's value and belief about a resource and about which behaviours are acceptable and which are not (Ostrom, 1990). When a group shares norms that encourage collective behaviour and conservation, then collective action is likely to be successful. These norms may act as a powerful incentive-shaping and sanctioning tool for resource users and rule breakers respectively, such that the costs associated with monitoring and enforcement are low (Imperial and Yandle, 2005). In addition, since the group has shared values and views of how things should be done, they may find it easier to negotiate on the rules regarding the use of the resource.

ix. Past successful experience – social capital

Social capital has an indirect impact on an individual's choice through its influence on trust, which is essential in shaping individual choices (Wade, 1988b). An increase in social capital is associated with an increase in the likelihood of collective efforts by increasing the chances of developing trust during social contact (Meinzen-Dick et al, 2002). A high level of trust amongst resource users is likely to reduce the propensity to cheat, since resource users have already had

previous positive experiences with each other and they are therefore more confident that other resource users are also conforming to the rules in use. As a result, the costs of negotiating, monitoring and enforcing rules is lower than in circumstances where individuals have no previous successful experiences in unrelated collective efforts.

x. Appropriate leadership

Collective action has better chances of being successful when it is headed by young, educated leaders who are familiar with changing external environments and who are connected to local traditional elites (Baland and Platteau, 1996). 'Leaders play a catalytic role in getting others to cooperate (Meinzen-Dick and Knox, 1999).' Their ability to articulate current policies and to negotiate with the external forces such as the government determines the level of confidence of the rest of the group. Approval from the traditional elite helps them gain trust and respect from both elderly and young and reduces conflict with traditional leaders (Meinzen- Dick et al, 2002).

xi. Heterogeneity

The dispute over the effects of heterogeneity on the ability to motivate collective action is still to be settled. Researchers have identified different sources of heterogeneity that can exist within a group of users and they have found that different sources of heterogeneity may have different effects on collective action (Baland and Platteau, 1996).

Baland and Platteau (1996) found that heterogeneity of interests and identity are negatively related with success in collective action, whilst Pranab & Dayton-Johnson (2002) and Andersson and Agrawal (2011) found that economic inequality (wealth and income), ethnic heterogeneity, social heterogeneity are all negatively related with success in collective action. Agrawal (2000) in Adhikari (2001) also found that collective action is difficult when there is large variation in the needs of group members.

b) Relationship between resource system characteristics and group characteristics

xii. Overlap between residential location and resource location

When resource users live with the resource, they can more easily monitor the physical state of the resource and the behaviour of other resource users to ensure they are also following the rules of the group (Ostrom, 1990).

xiii. Level of dependence by group members on resource system

The level of economic interest in a resource influences the level of interest in the sustainable management of the resource. When a large proportion of resource users depend heavily on the resource, this high economic interest in the resource influences them to protect the resource for

themselves and for future generations, thus increasing cooperation in collective action (Wade, 1988a; Ostrom, 1990). According to Mushtaq et al, (2007), this is not surprising since resource users to whom the resource system is crucial ‘have more incentives to work together to make sure that the resource is functional’ and able to provide benefits for as long as possible.

xiv. Fairness in allocation of benefits from common resources

If resource users are convinced that each user in the group is receiving and incurring a fair allocation of benefits and costs respectively, then they are more likely to engage in collective efforts. An unfair distribution encourages cheating from group members who feel that benefits are not shared fairly. This is among the chief reasons why many collective efforts have failed (Lahiff, 2007; Songorwa, 1999; Jones, 2004).

c) Institutional arrangements

xv. Rules are simple and easy to understand

When rules are simple and easy to understand to the resource users using them, collective action has better chances of working. In such circumstances, users understand what is required of them and the consequences of their actions, which makes enforcement of the rules easier (Baland and Platteau, 1996).

xvi. Locally devised access and management rules

When resource users are actively involved in making the rules regarding the use of and access to the resource systems, the rules are more likely to reflect the needs and beliefs of the people. thus, although not guaranteed, this is likely to decrease the incidences of cheating from the resource users and thus increase the likelihood of collective action (Kuperan et al, 1998 in Adhikari, 2001). It also gives them the capacity to modify the rules in response to changing circumstances around them and therefore adapt to changing circumstances (Ostrom, 1990).

xvii. Presence of graduated sanctions

If collective action is to be successful, there must be some form of punishment for breaking the rules. For these punishments to be effective and encourage cooperation amongst members the punishments given must match the seriousness and the frequency of the crime committed. According to Ostrom (1997) resource users will continue to cooperate as long as they perceive the punishment for breaking rules to be optimal and adequate.

xviii. Accountability of monitors to resource users

If collective action is to be successful, there must be a monitor physically present at the resource to observe the condition of the resource and to ensure that both resource users and/or outsiders use the resource according to the rules agreed upon by the resource user group. For monitoring to be effective, these monitors must be fully accountable to resource users and report any misuse or disregard for these regulations so that cheaters may be punished accordingly. In this way, monitoring decreases the incentive for resource users to break rules, thus increasing the likelihood of successful collective action (Ostrom, 1990; Baland and Platteau, 1996).

d) Relationship between resource system and institutional arrangements

xix. Match restrictions on harvesting to regeneration of resources

If a renewable resource is to continue producing benefits ad infinitum, and thus create incentives for its management and for its improvement, rules of use must guarantee that the resource will not be depleted. The rules must therefore be structured in such a way that the resource, for example fish and forest, have sufficient time for reproduction and the stock of resource available to reproduce in the next period is not depleted. When restrictions on harvest match the regeneration of resources, the resources and collective action have better chances of being sustainable (Ostrom, 1990).

e) External environment

The preceding sections have discussed findings on the effect of internal factors on the likelihood of collective action. There are other external factors, such as their relationship with the state, market pressures and technology, which influence the ability of collective resource user groups to work collectively.

Understanding the context in which decisions are made provides research with more complete information from which more precise conclusions regarding the decisions of resources users to act collectively or not can be drawn, and generate more accurate comparative studies which seek to explain the differences in collective action which are seen across case studies (Stern, Dietz, , Dolsak, Ostrom & Stonich, 2002; Edwards and Steins, 2010; Agrawal and Chhatre, 2006).

Relationship with the state

xx. Central governments should not undermine local authority

‘The less the state wishes or is able to undermine locally based authorities and the less it can enforce private property rules or provide maintenance of assets from its own budget, the better the chances of collective action (Wade, 1988a).’

Resource users do not operate in isolation from the political system in which they are embedded. The decisions of the larger political system not only shape the opportunities that the resource users have, but have an influence on the strength of their organisation and management (Edwards and Steins, 2010; Agrawal, 2001; Ostrom, 1997). Once they do not have the backing of the state, which gives them the authority to make and enforce rules, cheating and free riding will arise and thus collective action will fail (Ostrom, 1990; Meinzen-Dick and Knox, 1999).

xxi. Appropriate levels of external aid to compensate local users for conservation activities

Conservation practises are essential in improving the productivity of a natural resource system so that it can generate benefits for longer. Such practises are normally required to improve the physical condition of the natural resource system so that it is more productive and to restore it to its steady state – that is, the condition in which it is able to perpetually produce a certain level of benefits. This may entail reduced access to the resource system and reduction in levels of resources that can be harvested, which may also reduce the direct immediate income generated from that resource.

Researchers have found that if a group of users pursues conservation practises that may reduce the immediate direct economic benefits of exploiting the resource, then there must be some form of compensation, which resource users perceive as adequate and appropriate for those losses in income or livelihood which are associated with the conservation activity (Baland and Platteau, 1996; Jones, 2004). The lack of such powerful economic incentives has been blamed for the failure of many community based natural resource management programmes and, in some cases, their collapse (Muchapondwa, undated; Baland and Platteau, 1996).

Technology

xxii. Cost of exclusion technology

Resource users will have an incentive to protect and improve a resource system from which they can be assured that only they will benefit from limiting their use of that resource. This can only be achieved if they are successful in excluding outsiders from using that resource. However, excluding outsiders is not costless. Higher costs of exclusion may inhibit the survival of collective efforts since they lower the net benefits of investing in a collective effort. Collective action is therefore more likely to survive where the costs of excluding outsiders are low, as this has a positive impact on the net benefits gained by resource users (Wade, 1988a¹; Agrawal, 2001a).

xxiii. Level of integration with external markets

Market integration refers to the level of association between the community of resource users and the market for the collective resource that the group governs. It affects common property regime institutions in different ways. Firstly, it can expose resource users to a wider range of possible uses of, and markets for, a collective resource. This may push resource users to disregard the levels of resource extraction that were initially set by their group and rather pursue unsustainable levels of resource extraction to gain a higher personal benefit. Secondly, resource users may be exposed to alternative, more modern and even more authoritative structures of governance, and new ways of doing things. Such exposure may lead the resource users looking down on and disrespecting local traditional authority, and thus breaking the rules without any fear of punishment. As a result, effective common property regime institutions for natural resource management cannot survive in the presence of the economic forces generated by markets (Baland and Platteau, 1996). However, Agrawal (2001b) argues that linkages to markets are not absent in successful common pool resource systems and therefore, there is a need to go beyond this panacea to explore the nature of these relationships.

xxiv. Rate of integration with external markets

The rate at which communities are integrated with markets is also of concern as it affects the ability of resource users to adjust to the changing environment (Baland and Platteau, 1996). A rapidly changing environment introduces uncertainty into individuals' decision-making process. This may reduce their level of confidence that the collective effort is able to withstand these

¹Although Wade (1988a) refers to it as 'high' costs of exclusion, his explanation and that from Agrawal (2001a) both justify the change of Wade's typo error from high to low costs of exclusion.

external forces and to ensure that those who are participating in these collective efforts will continue to gain from their cooperation. Consequently, collective action is less likely to survive where the process of market integration occurs rapidly, and has better chances of survival where this process is gradual.

xxv. Nested levels of appropriation, provision, enforcement and governance

Complex systems need to be carefully organised to ensure that the rules made and the distribution of benefits, and resolution of conflicts are done effectively. According to Ostrom (1990) if appropriation, provision, enforcement and governance are arranged in levels of hierarchy, collective action will be more organised and therefore more likely to be successful than when these functions are not shared in such a manner.

2.3 CONCLUSION

The first section of this chapter demonstrated that research on the collective management of natural resources is important now more than ever in South Africa because common property regimes in the country's landholding are intricately linked to the livelihoods of millions of previously disadvantaged people, and to highly valuable agricultural land that is important to the economy and to the food security of the nation.

A review of literature on the theory of collective action in NRM revealed that scholars still need to fill in many gaps in order to build a comprehensive theory of common property based NRM. To date, the theory has only advanced as far as identifying critical enabling conditions for successful collective action in NRM. To develop further, research needs to identify the relationships between variables, causal mechanisms and the relative contribution of the different variables, and to resolve disputes on the direction and magnitude of influence of some variables, such as group size, heterogeneity and levels of poverty. For this to be accomplished, research needs to conduct large N or comparative studies that take into account all the important factors known to enable successful collective action (Agrawal, 2002; Poteete and Ostrom, 2004b). However, conducting large N or comparative studies from existing studies is difficult because existing studies have often omitted some important variables, such as the context and resource characteristics of storage, stationarity and predictability. In addition, existing studies comprise mostly random case studies, most of which are success stories and in which the definitions of variables often differ; thus making robust comparisons difficult (Meinzen-Dick and Knox, 1999; Agrawal, 2002, Poteete and Ostrom, 2004).

Therefore, it is recommended that to develop the theory further, future research on the commons should consist of carefully designed large N or comparative studies. However, Agrawal (2002) notes that 'a large N study of commons institutions that incorporated more than 30 independent variables

and their interactions would require impossibly large samples and entail astronomically high costs, thus making carefully designed comparative studies the most effective option to advance the theory of common property based NRM further. Thus, this study was based on a comparative analysis of two CPAs based in the Limpopo province of South Africa.’

The following chapter describes the study area chosen for this study, followed by a description of the methodological choices in Chapter Four CHAPTER .

CHAPTER THREE

STUDY AREA

The aim of this study was to use the theory of collective action to explain the different collective outcomes observed in South Africa’s CPAs based on the experiences of Bela-Bela CPA and Bjatladi CPA. This chapter provides a description of the study area. The first section provides an overview of the geographical location, local climatic conditions, vegetation, and agricultural activity of the Limpopo Province, where both CPAs’ land is located. The second section then presents a description of each of the CPAs’ resources, people, and outcomes of collective action.

3.1 GENERAL OVERVIEW OF LIMPOPO PROVINCE

3.1.1 Location

The study was conducted in Limpopo Province. It covers 125 754 square kilometres, which constitutes about 10.3% of South Africa’s total land surface area. It is located on the north-eastern part of the Republic of South Africa, bounded on the north by the Great Limpopo River, and by neighbouring countries: Botswana, Zimbabwe and Mozambique, and shares its southern borders with Mpumalanga, Gauteng and North-West provinces of South Africa (Figure 1). It is divided into five district municipalities: Capricorn, Mopani, Sekhukhune, Vhembe and Waterberg.



Figure 1: Map of Limpopo province

3.1.2 Climate and vegetation

Much of Limpopo, especially in the northern and eastern parts of the province, enjoys a subtropical climate. Summers are hot and humid and stretch from October to March, whilst a mild, mostly frost-free, dry winter characterised by cold nights, chilly mornings, and sunny days stretches from May to September. On average, the province receives 600 mm of rainfall per annum during summer, and summer temperatures are around 27 degrees Celsius.

Limpopo is in the savannah biome. Its vegetative cover is largely bushveld and consists of mixed grassland and trees. The region is suited to a wide range of agricultural activities such as tea, coffee, fruits, vegetable and maize production, cattle-ranching and game farming.

3.1.3 Population and socio-economic conditions

Limpopo province has the fifth largest population in South Africa, estimated at 5 518 000. Limpopo is the poorest, most rural and most dependent on agriculture for its livelihood and income (SSA, 2012a). It has the largest proportion of dwellings located in tribal or traditional areas in South Africa, of more than 70%, compared to a national average of 27.1%. In addition, the province has the highest incidence of poverty in the country, of up to 78.9% of its people living below the national poverty line, which is also higher than the national average of 59.6 % (SSA, 2012a). Furthermore, it has the highest proportion of households engaged in agriculture in the country. According to the General Household Survey (SSA, 2013), 45.9% of Limpopo households are engaged in agricultural activities above the national average of 18.1%.

3.1.4 Agricultural economy

Commonly known as South Africa's garden, its rich endowment with biological natural resources and warm subtropical climate renders Limpopo province an agricultural hotspot that cuts across a variety of agricultural activities and is therefore important to the national economy. According to the DAFF (2013), Limpopo's livestock sector makes significant contributions of up to 23.5 and 19.3% respectively of the country's pigs and goat produce and much smaller proportions of 7.5% and 1.1% to the production of cattle and sheep respectively. Each year, its fruit and vegetables, including avocado, oranges, mangoes, papaya and tomatoes, accounted for almost two-thirds of the nation's total horticultural output from which the export-oriented nature of its fruit produce renders it fundamental to the national economy. Thirdly, the province also made significant contributions to national field crop produce of more than 10% in cotton, sunflower seed, dry bean, commercial sorghum, and between 5% and 9% of wheat and groundnuts. The province also contributed small quantities of less than 2% to the national produce of barley, soya bean, maize, tea, coffee and canola. Lastly, hunting, facilitated by the abundance of wildlife in this province, is a major activity,

accounting for 80% of national output each year. It is worthy to note that the province's most significant contributions to national agricultural output are wildlife and citrus production. In total, agricultural activity contributes about 2.5% to the province's GDP.

3.1.5 Ownership of farmland

Approximately eighty-eight per cent (88%) of Limpopo Province's total land area is utilised for agricultural activity. Of this, 70% consists of large-scale commercial farms, while 30% consists of small-scale subsistence farms located mostly in the former homelands. With 80% of the province's farmland already under claim, land restitution has the potential to continue to alter not only the landholding structure but also the province's land use, agricultural production levels and productivity.

By 2013, the government had transferred the ownership of approximately 1.5 million ha of land to 4 026 land claimants, consisting of small families and mostly large communities organised mostly as CPAs. Amongst the most significant claims – because the large sizes of land awarded to these claimants occurs on prime agricultural land (CRLR, 2013) – are Makuleke; Kranspoort; the Levubu cluster of seven communities namely Masakona, Ratombo, Ravele, Shigalo, Tshakhuma, Tshitwani and Tshivhazwaulu; Bjatladi (Zebediela Citrus); Moletele (Hoedspruit); and Bela-Bela. This study focuses on Bela-Bela and Bjatladi land claims located in the Waterberg and Capricorn districts respectively.

Both the Bela-Bela and Bjatladi land claims were settled after five-year battles from 1998 to 2003 and are organised as Communal Property Associations (CPAs). The following section presents the details of compensation awarded to each CPA, a description of the land restored and its current uses, land ownership and management structures, a description of the CPA communities and of the post-settlement benefits derived from the land claims.

3.2 BELA-BELA LAND CLAIM

3.2.1 Details of compensation

The Bela-Bela land claim was awarded a total of 6 724 ha of land and a financial grant of 90 million rand. Thirty percent (30%) of the financial grant was directed towards improving the condition of the CPA properties, while the rest of the grant was shared amongst the CPA members. Each member received approximately R90 000.

3.2.2 Description of properties and current land uses

The land restored to the Bela-Bela CPA consists of seven different properties, namely Olievenfontein 475KR, which is also known as Bonwa Phala game farm, Aliwal farm 486KR, Langkuil farm and

Zoete-Inval farm 484KR and portions of Rietspruit 527KR and portions of Droogsloot 476KR. All the properties are located in the Waterberg district municipality.

The main activities conducted on the Bela-Bela CPA properties are game farming, crop production and cattle ranching. Other activities also include hosting a local fire-training programme, while one property is used for administration and training purposes of the CPA.

a) Game farming

Game farming is conducted on Olievenfontein 475KR, commonly known as Bonwa Phala Game Farm, which is the largest of Bela-Bela CPA's properties, covering 4 500.6 ha. In 2009, when the farm was acquired, it was overstocked and the total herd of game was 2 646. By 2011, the farm management had reduced the herd to a healthier stocking level of 1 459 animals, as recommended in the business plan. To date, the game farm management has successfully maintained this healthier stocking level.

Bonwa Phala Game Farm has over 40 species of wildlife, consisting of the original mix of animals found on the farm in 2009, that is, grazers, mixed feeders and browsers. Grazers include buffalo, blesbok, gemsbok, ostrich, red hartebeest, waterbuck, warthog, blue and black wildebeest, and make up 38% of the total herd. Blue wildebeest make up the largest proportion of these grazers (36%) followed by the warthog and blesbok, which make up 23 and 20% of the grazer's population respectively. Mixed feeders include eland, grey duiker, impala, inyala, springbok and steenbok and constitute 52% of the total herd. Browsers such as kudu and giraffe make up 10% of the total herd. Apart from the animal herd, the game farm is also home to about 270 bird species and a diversity of flora and fauna.

The game farm has a main lodge with ten chalet units and a tented camp with seven units. At the time that the land claim was settled, these buildings and the farm's fences were dilapidated. The CPA has since repaired and upgraded the fence, rebuilt the tented camp units, repaired the main lodge's dining room area and swimming pool, replaced damaged furniture, windows and doors and re-thatched two out of its ten main lodge chalet units.

The game farm generates income through hunting and ecotourism. Hunting contributes 70% of the total income earned from the game farm, while ecotourism contributes 30% to the total farm income. The farm does not sell any of the game meat, but instead distributes it to CPA members on a monthly basis during the hunting season. Since completing the renovations to the farm buildings and fences in 2011, the booking rates and income have both increased by huge margins. Management also plans to introduce buffalo breeding on one of its other properties.

b) Crop production

A total of 488 ha consisting of Zoete-Inval, Aliwal and Langkuil farms and a portion of Rietspruit is utilised primarily for the intensive irrigation cultivation of maize, seed sunflower and sugar beans on a crop rotation basis. At the time of the settlement of the land claim in 2009, irrigation facilities were only available on Langkuil farm, but were later introduced in the other three farms in 2012.

The CPA sells its seed sunflower and maize to private contract buyers. Part of the vegetable produce is also sold to other local buyers while some of it is distributed among the CPA members on a monthly basis.

c) Cattle ranching

790 ha from Droogsloot farm and portions of the Rietspruit farm are used to rear 300 herd of beef cattle. The cattle are either sold at the local auction or slaughtered for consumption by CPA members.

3.2.3 Ownership and management structure of Bela-Bela CPA properties

As part of its strategy to ensure that land restored through the restitution programme remained productive, the state stipulated that restored land was to be used for the purposes of commercial agricultural production as per a detailed business plan. To accomplish this, land restitution claimants retain 100% ownership of their land but are required either to form partnerships with a strategic partner – an experienced farmer in a similar field of production – or to hire an experienced farm manager to manage their farms. The main purpose of these collaborations is that the strategic partner or farm manager will provide their skills, financial capital, expertise, market access, and training of CPA members, while receiving a share of the profits or a salary.

Bela-Bela CPA chose to form a strategic partnership with an experienced farmer. In this partnership, the CPA owns 100% of the restored land and it leases this land to two operating companies, Geviet Private Limited (P/L) and Mahlohomolo Private Limited (P/L) which are jointly owned by the CPA and the strategic partner. In each of these companies, Bela-Bela CPA holds 52% of the shares while the strategic partner holds 48%. Geviet P/L is for the management of crops and cattle ranching enterprises, while Mahlohomolo P/L is for the management of the game farm.

The strategic partner is a farmer from the Waterberg district whom the CPA met during the negotiation process with previous landowners over the restitution claim. This strategic partner was instrumental in these negotiations and over the years, has devoted considerable financial resources, time and expertise towards the development of Bela-Bela CPA properties. To date, the Bela-Bela CPA community and their strategic partner have maintained a good relationship with no record of unresolved conflict between them.

3.2.4 The Bela-Bela CPA community

Since the Bela-Bela CPA was established in 2003, its membership has remained constant at 242 members. Most of the members are of Tswana origin. To qualify for membership, individuals had to prove that either they were originally displaced from the land claimed by the Bela-Bela CPA community after 1913, or that they were direct descendants of such an individual. Once the land claim was settled in 2003, the Bela-Bela CPA stopped accepting new members. No new members have been added ever since. Upon the death of a member, their membership is taken over by an individual pre-selected by that deceased member.

Every five years since its establishment, the community has held elections to select an executive committee. This committee is responsible for making business decisions on behalf of the CPA, implementing and managing CPA projects, conflict management and working with the strategic partner. The executive committee consists of a chairperson and the deputy, secretary and the deputy, treasurer, four other committee members and an ex-officio member, a position currently held by the reigning chief of the CPA. The ex-officio member is part of the executive committee throughout his life. The rest of the executive committee members, however, can only hold office for three consecutive terms of five years each. To date the CPA has re-elected the original committee into office at each election, thus allowing committee members to serve the full three terms.

As per the requirements of the CPA Act 28 of 1996, the Bela-Bela CPA community drafted its own constitution with the help of a lawyer of its own choice. To date, none of the CPA members has violated any of the laws encoded in that constitution, neither has there been any record of unresolved disputes among CPA members or with non-CPA members. In addition, since 2003 Bela-Bela CPA has submitted yearly progress reports to the DRDLR as per government regulations. The progress reports include an updated list of its members, election of office bearers, annual financial statements and signed minutes of its annual general meeting.

3.2.5 Benefits to CPA members

The direct benefits enjoyed by members of Bela-Bela CPA include a monthly food package, employment, training and skills development. The CPA also purchased a vehicle used for administration purposes.

In 2010, the strategic partnership introduced food packages through which members of the CPA would benefit directly from farm activities. Each of the 242 members receives an equal monthly food package consisting of 4 kg of vegetables, 12.5 kg of maize meal and 4 kg of meat. Vegetables may consist of sugar beans, butternut, carrots or any other vegetables available on the farm. Meat may be either beef or game, depending on availability. To date, the quantities in the food package remain

unchanged throughout the year except during the Christmas season when the quantities of food items are doubled. In addition, each month the CPA also donates an average of two packages each to an Old People's Home and to a Non-Governmental Organisation (NGO) in Makapanstad.

In 2012, the CPA initiated a Learnership Programme aimed at providing farm management skills to at least ten beneficiaries each year. The programme was developed in collaboration with AgriSETA, a government agency that provides education, training and development skills to the agricultural sector players. Of the ten beneficiaries trained in 2012, six were absorbed into the existing farm enterprises of the CPA while the rest are yet to be absorbed into future projects.

Because of limited employment opportunities on CPA farms, the CPA has created other opportunities that could benefit its members. In 2014, the CPA embarked on a large poultry project managed by 60 of its female members.

3.3 BJATLADI LAND CLAIM

3.3.1 Details of compensation

The Bجاتladi CPA was awarded 5 973.203 ha of land and a financial grant worth approximately 17 million rand. The CPA invested 70% of these funds into repairing the infrastructure on the land and shared the rest amongst its members. Each member received about R15 000.

3.3.2 Description of land and current uses

The land restored to Bجاتladi CPA, Zebediela 101 KS, is the largest single citrus farm in the country and in Southern Africa, known as the Zebediela Citrus Estate (De Villiers and Van den Berg, 2006). It is located in the Capricorn district municipality, approximately 55 km from the provincial capital, Polokwane.

The main activities conducted on the farm are the cultivation and sale of citrus fruit, cattle ranching and a housing department.

a) Fruit production

Currently, about 1 000 hectares of the Zebediela Citrus Estate is used to cultivate a variety of citrus fruit namely naartjies, lemons, and oranges and other fruit such as macadamia.

The total area under cultivation and the number of fruit types grown on the farm has increased since 2003. In 2003, only lemons and oranges grew on about 850 ha of Zebediela estate. From 2005 and 2007, a new 156 ha orchard of macadamia was introduced followed by an 80 ha naartjies orchard

introduced in 2011. Most of the fruit is exported to the international markets while some is sold to the local market from the Zebediela Cash And Carry Store located on the farm.

According to key informants, apart from repairing only some of the farm's fence in 2003, very little effort or investment has been directed toward improving the farm's infrastructure and equipment. As a result, the buildings, tractors, trailers, and some of the fences are old, damaged and dilapidated. Furthermore, although production on the farm continues, the citrus production on the farm has also failed to meet its intended targets of expanding existing citrus fields and introducing new fruits on the farm.

b) Cattle ranching

From a herd of 260 cattle in 2003, the farm now owns a herd of 500 cattle. The cattle are sold at local auctions.

c) Housing department

The Zebediela Citrus Estate housing department comprises fifty houses rented to non-CPA members. The rentals collected from these houses contribute toward the rental income earned by CPA. The houses and roads in the housing department are old, in poor condition and require urgent repairs.

3.3.3 Ownership and management structure of Bjatladi CPA properties

Bjatladi CPA owns 100% of the land and leases it out to Zebediela Citrus P/L, a company jointly owned by the Bjatladi CPA, a strategic partner and Zebediela Workers' Trust. The strategic partner is the majority shareholder of the company with 50%, followed by the Bjatladi CPA which holds 35% and lastly Zebediela Workers' Trust which holds 15% of the company shares. Zebediela Workers' Trust consists of farm workers that were already employed on the farm when Zebediela Citrus Estate was handed over to Bjatladi CPA in 2003. Most of these workers are not members of the Bjatladi CPA.

When Zebediela Citrus Estate was handed over to Bjatladi CPA in 2003, there were already 236 workers employed on the farm. One of the conditions for the transfer of Zebediela Citrus Estate to the CPA was that farm workers that were already employed on the farm were to be retained under similar working conditions (De Villiers and Van den Berg, 2006). These workers, most of whom were not members of the Bjatladi CPA, then formed a Farm Workers' Trust and with the help of government's Agricultural and Rural Development Corporation (ARDC) acquired a 15% share of the Zebediela Citrus P/L (Tilley and Lahiff, 2007).

The Trust has 236 members. It does not accept new members and once a member leaves the employ of the farm, that member loses his or her membership of the Zebediela Workers' Trust. The

agreement between the Zebediela Workers' Trust and the CPA is that the shares and positions of any member of the Trust that leaves the employ of the farm are automatically transferred to the CPA. To date, the 236 workers are still working on the farm, thus the overall structure of shareholding in Zebediela P/L has not changed.

The government was instrumental in identifying a suitable strategic partner for the CPA and recommended him on his record of previous successful working experience in citrus production on the Zebediela Estate and with other land reform projects. The CPA itself, however, had no prior interaction with him.

Bjatladi CPA faces a plethora of challenges linked to its strategic partnership. First, the relationship with its strategic partner has deteriorated over the years. In a review of successful land restitution cases in Limpopo, De Villiers and Van den Berg (2006) noted that teamwork and good relations were an essential component of the success of the case of the Bjatladi Land Claim. They highlighted that, interaction between the strategic partner, and representatives of the CPA and of Zebediela Workers' Trust appeared to be good and all three parties were often collectively involved in making daily operational decisions. However, over the years, fighting, mistrust and lack of communication have replaced the strong working relationship between the CPA and its strategic partner, thus melting the strong bond that once existed. This has led to lengthy and cumbersome disputes between the strategic partner and the CPA and amongst the CPA members themselves. The serious and prolonged nature of the power struggle between the CPA and its strategic partner now threatens to halt production on the farm. In addition, the strategic partner appears to have demonstrated little interest towards the long-term survival of the farm. He has made very little effort to repair or improve farm infrastructure or to augment equipment stocks and no effort to develop the managerial skills of CPA members.

3.3.4 The Bjatladi CPA community

The Bjatladi CPA was established in 2003. To qualify for membership of the Bjatladi CPA community, individuals are required to prove that they or their spouse were originally displaced from the restored land and Zebediela 101 KS after 1913, or that they are direct descendants of such an individual. The Bjatladi CPA community has increased from 331 members in 2003 to 1 200 members in 2014. This is mainly because to this day, the Bjatladi CPA is still accepting new members and, when a CPA member dies, the deceased's entire immediate family take over the deceased's membership. Members are mostly Tswana and Sepedi (Northern Sotho) speaking.

The Bjatladi CPA leadership consists of an executive committee that represents the interests of the CPA in Zebediela Citrus P/L, and manages the CPA finances, assets and projects. The committee consists of twenty one members and includes a chairperson and the deputy, secretary and the deputy, treasurer, and sixteen other committee members. It does not, however, include an ex-officio member

or a traditional chief. Every five years since 2003, the Bjatladi CPA has elected an executive committee. Each time, it has re-elected the same individuals to office. Thus, the existing committee members have served the full term of three consecutive five-year terms.

The Bjatladi CPA is governed by a constitution stipulating the roles, responsibilities and rights of every CPA member. As per the constitution and government regulations, each year since 2003 the Bjatladi CPA has held annual general meetings (AGMs) and submitted a copy of the AGM minutes, a progress report including financial statements, a membership profile, and election of office bearers to the DRDLR. In addition, none of the CPA members have violated any of the CPA rules contained in the constitution.

3.3.5 Benefits to CPA members

The benefits enjoyed by members of the Bjatladi CPA include a share of the annual profits from Zebediela Citrus P/L, one bag of oranges per member each year and occasional temporary employment opportunities available throughout the year.

Each year since 2004, Zebediela Citrus P/L pays rent to Bjatladi CPA for its land. The Bjatladi CPA also makes profits from Zebediela Citrus P/L operations. At the end of each year, the CPA holds an annual general meeting during which all members of the Bjatladi CPA decide on how to use their profits and income from rentals. The Bjatladi CPA community decided that every other year they would share the total income earned equally among all CPA members; and in the rest of the years, they would reinvest into Zebediela Citrus P/L or save the money in the CPA bank account for future use. Over the years, members have earned an average of R500 per member in each year that the CPA shared its rental income and profits.

A major challenge to increasing the total income awarded per member may be due to the increase in the size of Bjatladi CPA membership each year without an accompanying increase in production on Zebediela Citrus Estate. In 2003, Bjatladi CPA consisted of 331 members, but increased to 1 200 in 2014. On the production side, however, there have been low levels of growth due to the ensuing power struggles between the strategic partner and the CPA.

In terms of generating its intended benefits of employment creation, training and skills development, the Bjatladi CPA has only been able to create temporary employment opportunities, for which its members are given first preference. Apart from this, the Bjatladi CPA has failed to generate any permanent on-farm or alternative employment opportunities for its members. By 2014, the CPA had not yet implemented its plans to start a large 5000-bird poultry project from which it could create at least 60 new permanent employment opportunities using funds saved from its annual rental income.

No other additional income-generating projects have been introduced either. At the same time, none of the CPA members has received any form of training or skills development through the CPA.

3.4 CONCLUSION

This chapter described the study area chosen for this study. The description of the two CPAs, Bela-Bela and Bjatladi CPA suggests that collective action outcomes are better in Bela-Bela CPA compared to Bjatladi CPA and therefore, based on the theory of collective action, the study should expect Bela-Bela CPA to outperform Bjatladi CPA in most or all of the factors known to facilitate successful collective action in NRM. This study will therefore establish if it is indeed true that enabling conditions are more favourable in Bela-Bela CPA compared to Bjatladi CPA, and which of the enabling conditions can explain the differences in the collective action outcomes observed in these two CPAs. The following chapter describes the methodological choices made for this research, followed by a presentation and discussion of the results in Chapter Five.

CHAPTER FOUR

RESEARCH METHODOLOGY

This chapter presents the methodological choices made for this study. The first section explains and justifies the research design. The second section presents the methods, procedures and materials used for data collection. The methodological issues and ethical considerations are outlined in Section 3. In Section 4, a description of the independent variables – the critical enabling conditions for sustainable collective action in NRM – are given. Lastly, the method of data analysis is described in Section 5.

4.1 COMPARATIVE RESEARCH DESIGN

Research design or approach refers to the arrangement of conditions for collection and analysis of data in a manner that meets the needs of the research within the limits of the resources available to the researcher. Since the overall objective of this study was to use the differences and similarities in the variables known to facilitate collective action in NRM to explain the different collective action outcomes observed in two South African CPAs, a **comparative research design**, using both quantitative and qualitative elements, that is, mixed research methods, was used.

Comparative research involves qualitative and/or quantitative comparison of a large number of variables across a few cases – social entities, two at the least (Lijphart, 1971; Mills, Van de Bunt & De Bruijn, 2006). It is used ‘to separate patterns that are more general and isolate irregularities from a context laden environment thus uncovering both similarities, differences and unique aspects of cases that would otherwise be impossible to detect (Mills, et al, 2006).’ It is the best option when a study aims to investigate a large number of variables, but the researcher’s time and financial resources do not permit a large number of cases to be included in the study (Lijphart, 1971).

4.1.1 Rationale for comparative research

According to Lijphart (1971), the three basic methods of conducting scientific research are experimental, statistical and comparative. The experimental method measures the effect of a particular stimulus by comparing the differences between a group exposed to that stimulus, and an equivalent group – known as a control group – that has not been exposed to that particular stimulus. The statistical method involves mathematical manipulation of observed data in order to discover controlled relationships among variables. It requires a large number of cases for statistical manipulations to be possible. The comparative method, on the other hand, is an intensive systematic

investigation of a small number of instances of phenomena, two at the least, in order to draw conclusions about that phenomenon (Vogt, Gardner & Haeffele, 2012). This method allows for the comparison of a large number of variables across a few cases.

In light of the present research's needs, the comparative method was the most appropriate research method for many reasons. First, theoretical development demands that if the conflicting collective action outcomes were to be clearly understood, including the interaction between variables and their magnitude and direction of influence, as many of the thirty-three known facilitating conditions should be taken into account in a single research (National Academic Press, 2002; Gautum, 2007). Notably, as the number of cases in any study increases, the cases become less similar, thus decreasing the number and depth of variables that can be compared across cases (Lijphart, 1971; Ragin, 1987).

Second, literature (Meinzen-Dick and Knox, 1999; Meinzen-Dick, et al 2002; Agrawal, 2001) notes that the many single-case studies, or large statistical studies including only a few of the variables of interest have largely ignored the contextual features, thus rendering the current theory incomplete and possibly incorrect on some of its assumptions. The comparative method, on the other hand, allows research to capture the differences, similarities, and unique characteristics without totally ignoring contextual features (Lijphart, 1971; Macfarlane, 2006; Mills et al, 2006).

4.1.2 Rationale for mixed research methods

The present study sought to generate an empirical understanding of the known critical enabling conditions of collective action in NRM and use the differences in these conditions to explain observed differences in collective action outcomes. To achieve this, the study used the mixed research method, which refers to the sequential or simultaneous combination or integration of both qualitative and quantitative research and data in a single research study (Vogt et al, 2012; Creswell, 2014). Qualitative research involves the use of mostly text data to find out more about a phenomenon or a situation and is used to gain in-depth information about a few cases. Quantitative research, on the other hand, involves gathering data across a large number of cases – in breadth – and is concerned with explaining a phenomenon by testing pre-specified hypotheses of a theory.

In this study, quantitative and qualitative methods of research and data were combined sequentially for two main reasons; firstly, to ensure a complete understanding of collective action outcomes and the independent variables, and secondly, to ensure that good quality data were collected (Burke Johnson, Onwuegbuzie & Turner 2007; Creswell, 2014). Qualitative research was used in the first part of the study to gain an understanding of the nature, experiences and outcomes of collective action in CPAs and their context. This included information on the rules in use and their performance, the structure of the CPA management, role players in decision-making, land use activities and challenges faced by the CPA. This information was also used to tailor the data collection instrument used in the

second part of the study. In the second part of the study, quantitative research methods were used to obtain information about the CPA members' socio-demographic characteristics and their perceptions of the CPA rules, management and benefits.

The comparative research process was carried out as follows:

- i. Select case.
- ii. Use theory to aid in the identification of relevant differences.
- iii. Show that identified differences are relevant to the outcome of interest.
- iv. Based on the differences identified, formulate a general explanation of the phenomenon of interest (Ragin, 1987).

4.2 SAMPLING PROCEDURE

4.2.1 Sample size

Determining an appropriate sample size is critical in survey research as it affects the degree of confidence with which a survey can make inferences about the population from the sample. This study based its decisions of the sample size on recommendations made in literature on sample size. According to (Lijphart, 1971), for a comparative design, the number of cases should depend on the number of variables to be studied, and the amount of time and financial resources available for the research. The minimum number of cases acceptable for a comparative research design is two.

For quantitative research, researchers offer many guidelines and formulae to determine the appropriate sample size, based on the fraction of the population and acceptable margin of error, (Leedy and Ormrod, 2013). However, these guidelines and formulae are often difficult to follow because they require prior knowledge of population parameters and because studies often include multiple variables with different levels of measurement and acceptable margins of error. The Central Limit Theorem, on the other hand, states that a minimum sample size of 30 is adequate to provide a representative picture of any population of any size. Beyond that, sample size should depend on the objectives of the research, and the quantity of financial and temporal resources available (Andres, 2012).

Based on these recommendations, the number of CPAs selected for comparison was two. For the quantitative part of the study, the study chose a total sample size of 80 respondents; that is 40 respondents from each CPA.

4.2.1 Sampling design

Different sampling techniques were used to select: 1) CPAs to be studied, 2) participants to collect background information on each CPA, and 3) participants to learn about CPA members' socio-demographic characteristics and views on CPA rules, management and benefits.

To select the CPAs to be studied, the study required a sampling technique that would result in a sample that reflected the different collective action outcomes since the purpose of the study was to explain the different collective action outcomes observed in South African CPAs. Thus, purposive sampling was the most appropriate technique as this technique allows one to pick cases that reflect a specific phenomenon or characteristic of interest (Leedy and Ormrod, 2013). The study looked for a CPA that owned high value agricultural land, was using land for commercial agricultural production, had achieved most of its targets on its business plan and was considered as one of the most successful CPAs in generating intended tangible benefits from the CPA resource such as employment, income, food security and skills development for its CPA members. In addition, the CPA had to be in operation for at least ten years prior to the study and during this time, had no challenges with CPA members or outsiders breaking CPA rules or with no conflicts between the CPA and its strategic partner or conflicts among members of the CPA. Furthermore, the land and assets belonging to the CPA had to be in very good condition.

With the help of an official at the Limpopo DRDLR, the study identified Bela-Bela CPA located in Limpopo Province. In 2003, the Bela-Bela CPA was awarded over 6 000 ha of land, formerly used for game, crop and livestock production in the Bela-Bela district of Limpopo. By 2013, the CPA had made several improvements to the infrastructure on all of its properties and introduced irrigation facilities on some properties, and by 2014 had introduced a new poultry production facility. The CPA was labelled as one of the most successful CPAs in South Africa because the land restored to the CPA was being utilised productively for commercial activities, and through its activities the CPA had created tangible benefits for its members that included employment opportunities, a monthly food package and skills development (Nawa, 2013). In 2015, Bela-Bela CPA was also selected to represent and showcase successful land restitution projects before the Parliamentary portfolio committee of Rural Development and Land Reform.

Thereafter, the study sought to identify a CPA that was similar as much as possible to Bela-Bela CPA in terms of its structure, but in which the outcomes of collective action had deteriorated over the years. With the help of an official at the Limpopo DRDLR, the study identified Bjatladi CPA from Limpopo Province. In 2003, Bjatladi CPA was awarded about 6 000 ha of highly valuable agricultural land previously used for the commercial production of citrus. Although in 2006, De Villiers and Van den Berg (2006) had listed this CPA amongst the most successful in the province because the production

on the farm was largely in line with the targets set out in the business plan, the CPA worked well and had good relations with its strategic partner and there was no conflict among CPA members. However, by 2013 the relationship between the CPA and its strategic partner had deteriorated and appeared to be affecting cohesion of the CPA community, the CPA had not achieved most of the targets in its business plan and had failed to generate intended benefits of income, employment and skills development for CPA members.

The first part of the study involved collecting background information on each CPA. To achieve this, the study used purposive sampling to select three participants from each CPA because of their specific knowledge of the CPA rules, management, activities and performance of each CPA since the CPAs were first established in 2003. The study selected local leaders, namely the CPA chairperson and two other members of the CPA executive committee, one of which was a representative of the community on the executive committee. All the leaders interviewed were a part of the CPA since its establishment in 2003, held positions of leadership in the CPA for at least five years and were part of the current CPA leadership in 2013.

The second phase of the research sought to collect information about the CPA members' socio-demographic characteristics and views on CPA rules, management and benefits. The best method of collecting this information was by asking respondents these questions directly. However, due to the limited time and financial resources available, the study could not interview all the CPA members. In order to get a sample that was highly representative of each CPA, simple random sampling was used to select a sample or respondents from each CPA. In simple random sampling, each sample unit is selected randomly ensuring that each unit has an equal chance of being chosen thus the sample has higher chances of being representative of the population (Leedy and Ormrod, 2013).

4.3 DATA COLLECTION METHODS, MATERIALS AND PROCEDURES

The study used primary data gathered from key informant (KI) interviews and from a personal survey. Key informant interviews refer to in-depth interviews of a select group of experts who are most knowledgeable about an organisation or an issue (Parsons, 2008). Key informants provided information on the nature, experiences and outcome of collective action in each CPA. In a survey, on the other hand, a researcher gathers information from a pre-determined sample of individuals selected from a larger population of interest through their response to pre-determined questions about their characteristics, opinions and experiences and without any attempt to control or manipulate variables (Kelley, Clark, Brown & Sitzia, 2003; Leedy and Ormrod, 2013). The survey was used to collect information about the CPA members' socio-demographic characteristics and their perceptions of CPA rules, management and benefits. The following section provides a description of how each of these data methods was carefully conducted.

5.3.1 Key informant interviews

Using semi-structured questionnaires, the study conducted three key informant interviews in each CPA. For Bela-Bela CPA, interviews were conducted from the 19th to the 21st of March 2013 at their Bonwa Phala Game Farm; while for Bjatladi CPA, interviews were conducted at their Zebediela Citrus Estate from the 6th to the 8th of November 2013. Bela-Bela CPA interviews were conducted in English while those of Bjatladi were conducted in Northern Sotho with the help of an interpreter. All the interviews were recorded both in writing and electronically as they progressed. At the end of the interviews, each CPA chairperson organised a field trip on the CPA farms to enable the researcher to acquaint themselves with the activities discussed.

a) Key Informant Questionnaire development

To allow the key informants to express their views in their own words and to provide as much information as possible on the topic of interest, the study used a semi-structured questionnaire with open-ended questions to conduct the key informant interviews. The list of questions prepared beforehand (Annex 1) acted as guide in the interview to ensure that the discussions concentrated on issues related to the CPA's collective action. The questionnaire was prepared with the help of two experts from the University of Pretoria's Department of Agricultural Economics. Thereafter, it was pretested and the relevant corrections made before being used for the study.

To manage expectations and for ethical considerations, the questionnaire began with a covering letter explaining that:

1. The purpose of the study was purely for academic purposes
2. Participation was voluntary and anonymous
3. Information gathered in the interview would be strictly confidential
4. There was no risk in participating in the interview
5. Respondents were free to ask questions or request withdrawal from the interview at any time during the interview.
6. Participants were requested to sign the letter to show that they understood the information provided in the covering letter.

The rest of the questionnaire was divided into two main sections. Section One gathered information about the contents, governance, role players and members involved in the original land claim. It also gathered information on the details of the total compensation received by the claimants. Section Two gathered information on the current state of CPA land use and activity, governance and role players involved.

b) Implementation of KI interviews

Personal interviews were the preferred method of conducting interviews, because face-to-face interviews allowed the researcher to engage the key informant in an open discussion and, by way of probing, obtain more information about the issue. In addition, winning the trust of the key informants would be easier and allowed the study to link the information gathered during the interviews to direct observations on the CPA farms (Fowler, 2009).

To maximise the quality and quantity of data obtained from the interviews, the study took the following steps noted by Fowler (2009):

1. A month before conducting the key informant interviews, the researchers pre-arranged the dates, times and location of the interviews with the CPA chairperson via email.
2. The chairperson chose the location that was suitable for him and the key informants and was asked to identify a suitable time and date when each key informant would be available for at least two hours.
3. A copy of the questions used for the interview was sent to the chairperson beforehand. This gave the key informants an opportunity to organise any additional material such as a record of farm activities and management structures for the researcher beforehand and thus improved the quality of data obtained.
4. An interpreter was engaged and trained to assist with the Bjatladi CPA interviews allowing the interviews to be conducted in the key informants' mother tongue – Northern Sotho (Sepedi). The interpreter was also a University of Pretoria student from the Department of Agricultural Economics who was familiar with the terminology, focus and purpose of the interview.

5.3.2 Survey

Due to the limited time and financial resources available, the study conducted a survey guided by structured questionnaires to gather information about the socio-demographic characteristics, knowledge and perceptions of CPA members from a sample of selected CPA members at their homes of residence. According to Vogt et al (2012) surveys are an effective, cheap and often quick way to develop a representative picture of attitudes and characteristics of a population.

a) Survey Questionnaire development

The study used structured questionnaires designed by the researcher to guide the interviews with CPA members (Annex 2). This was because, although current literature on common pool research provides a list of the critical enabling conditions, it does not provide a standard instrument to assess these enabling conditions (Meinzen-Dick and Knox, 1999). It is therefore common for researchers in this field, as in the present study, to develop their own data collection instruments. In the present study,

the researcher consulted existing literature measuring the same individual variables and carefully combined them to form a single questionnaire. The researcher also received guidance from two experts from the University of Pretoria's Department of Agricultural Economics throughout this process.

The questionnaire was pretested on a sample of fifteen respondents, after which the relevant corrections were made before carrying out the final survey. Pre-testing is the most efficient way to check that an instrument measures what it is intended to measure, that questions are understood, and it gives the researcher a good indication of the time and resources that the final survey would require (Fowler, 2009; Leedy and Ormrod, 2013).

As in the semi-structured questionnaire used for key informant interviews, this questionnaire began with a covering letter to manage expectations, increase the response rate and for ethical considerations (Annexure 2).

The rest of the questionnaire was organised into seven sections as follows:

- a) Section A gathered general information including the enumerator's name, and the time, number and location of the interview. The information was mostly important for administrative purposes.
- b) Section B captured information regarding respondents' awareness of government and CPA rules regarding the use of CPA land and assets and the CPA management structure.
- c) Section C gathered information about the respondents' perceptions of its management, which in each question. Management meant either the executive committee or the strategic partner.
- d) Section D gathered information about the CPA members' social interactions with each other and with members of society in general.
- e) Section E collected information about respondents' own and other CPA members' involvement in the CPA meetings and regard for maintaining a good reputation in the CPA.
- f) Section F gathered information about the contribution of CPA benefits to the respondents' household.
- g) Lastly, Section G collected the respondents' demographic information- age, income, assets, marital status, agricultural assets, household size and composition by age group.

In any research, the quality of a survey instrument determines the quality and usefulness of data obtained from the survey. This study took the following steps to ensure that the questions covered only the variables relevant to the study, were reliable, in that they were good measures that could be used in comparable situations, and valid in that they are a true measure and mean what the researcher expects or wants it to mean (Fowler, 2009; Leedy and Ormrod, 2013).

The researcher:

1. Consulted existing literature to identify the best measurement instruments, that is, the set of questions used to measure the different variables. According to Fowler (2009) drawing from previously tested measurements helps to maximise the validity of one's questions.
2. By using a structured questionnaire, ensured that the study enhanced the consistency of measurement across respondents – reliability, by ensuring that every respondent was presented with an identical questionnaire containing identical questions presented in identical form and order (Fowler, 2009).
3. In this structured questionnaire, also enhanced reliability by making sure that all questions were written in full and that the interviewers read them as they appeared on the questionnaire.
4. In addition, consistency was ensured by ensuring that, as much as possible, the questions were close-ended with a list of possible answers to pick from and each time, specified the number of responses expected for each question.
5. Furthermore, the researcher ensured that the questions were simple, specific and provided definitions for ambiguous terms.
6. According to Lietz (2010) the reliability and validity of a Likert scale increases when the scale consists of between five to eight categories, includes a middle option, is monotonic and unidimensional. Taking this into consideration, the researchers decided that the general format of the Likert scale consisted of a numbered five-point bipolar scale including a middle (*not sure*) option.
7. Took into account that in order to avoid socially desirable responses instead of true ones, the numeric values attached to the Likert scale were such that the less socially desirable response appeared at the start of the scale, and the lowest value of one (1) was attached to the *disagree* option (Lietz, 2010). Vogt et al (2012) stress that it is important to reduce social desirability as it has a negative impact on the validity of the results obtained from a survey.
8. Took steps at the beginning of the interview to explain that this research was for purely academic purposes, that respondents were not at risk by participating, and that information gathered would be treated confidentially and anonymously because this also helps reduce the risk of social desirability affecting the response outcomes.
9. In addition, instead of asking respondents to specify sensitive information such as exact personal monthly income, the researcher asked respondents to identify the monthly income group they belonged to.
10. Furthermore, to prevent respondents from giving socially desirable answers, for some questions such as commitment to attending CPA meetings, the researcher asked respondents to not only report about their own behaviour and perceptions, but to also report on the behaviour and perceptions of other CPA members (Fowler, 2009).

To maximise both the quality and quantity of information that the instrument gathered, the researcher took the following steps to ensure that the layout of the survey questionnaire was clear, navigable and that the questions flowed well.

1. The questionnaire was divided into eight sections, numbered Section A to G, by grouping questions according to their relevant topics, thus making the questionnaire more navigable and coherent (Fowler, 2009).
2. Starting from general and proceeding to specific questions and from easy to difficult ones, not only improves the flow of the questionnaire but also has a more positive effect on the accuracy of the responses than would be the case if the order were reversed (Lietz, 2010). Thus, the general outlay of the questionnaire in the present study flowed from the easy, general questions on the rules and management of the CPA (Section B) to gradually more difficult questions on perceptions about in management (Section C). It moved to questions that are more specific and asked about the contribution of benefits and level of satisfaction in Section F and ended with sensitive information on the socio-demographic attributes of the respondent (Section G).
3. Literature also stresses that, since the attitudes that people develop towards an issue are influenced by the knowledge that they have obtained about that issue, testing their awareness about an issue should precede any question soliciting their position on that issue (Alreck and Seattle, 1995). Thus, the questions on knowledge of rules on management (Section A) preceded questions on perceptions and trust in management (Section C).
4. Putting demographic questions first has been found to introduce insecurity in respondents, lower respondents' confidence in the anonymity of their contributions, thus lower the respondents' preparedness to participate in a study, so in this study the demographic section (Section G) forms the last part of the questionnaire (Lietz, 2010).
5. Using italicised font to distinguish the enumerator-instructions from the actual questions for respondents written in normal font increased clarity (Fowler, 2009).
6. Powell (1998) also recommends the use of transitional statements to either break the monotony of a long series of questions or signal a new topic. Therefore, each section in this questionnaire began with a clear purpose statement – and often within sections. The study included a statement explaining what questions would follow.
7. In addition, as much as possible, the study enhanced continuity of the questions by using a similar response format within each section (Powell, 1998). For example, Section C on perceptions and attitudes towards management used mostly five-point Likert scales and multiple-choice type of questions while Section E used mostly a multiple-choice format and open-ended questions.

b) Implementation of survey

To ensure good quality data, enumerators were trained over a four-day period from the 3rd to the 6th of March 2014. Enumerators were taught how to navigate through the questionnaire, the meaning of each question and its responses and how to record these responses correctly. During training, the researcher emphasised the importance of achieving a high response rate, asking and recording responses to all questions and asking questions in the exact order they appear on the questionnaire.

Bjatladi CPA members were interviewed from the 14th to the 17th of March 2014, and Bela-Bela CPA members were interviewed from the 29th of March to the 1st of April 2014. To increase the response rate, the researcher pre-arranged appointments with each of the respondents. The surveys were carried out with the help of three enumerators who could read, write and understand the local languages, Tswana and Northern Sotho, very well. During the surveys, enumerators lived within the respondents' villages and conducted interviews whenever respondents were available at their homes and at the respondents' convenience.

To ensure high quality data, the researcher supervised the interviews and checked completed questionnaires thoroughly at the end of each day to identify errors or missing information. Enumerators gave feedback on their experiences and were given advice for correcting errors. In the case of missing information, enumerators re-visited respondents.

4.4 DATA ANALYSIS

Information gathered from the KI interviews in the form of written and recorded notes was transcribed onto Microsoft word documents in sentence form. The information was arranged in the same manner in which the questions were asked in the interview. The researcher read the information several times to gain a better understanding of the data and it was used to create a profile of the nature, experiences and outcomes of collective action in each CPA. Thereafter, qualitative assessments were made on how the differences observed in the different critical enabling conditions could be related to these experiences and outcomes of collective action.

Data from the individual questionnaires were entered into a Microsoft Excel spreadsheet. The data were then coded, cleaned and then analysed using the Statistical Package for Social Scientists (SPSS) Version 22. Since most of the variables were either ordinal or nominal, and not interval, the critical enabling conditions present in the two CPAs were compared using mostly non-parametric inferential statistics such as the Wilcoxon-Mann-Whitney U tests. Non-parametric tests are powerful hypotheses testing techniques based on ranks that are assigned to ordered data. They are ideal when the sample size is small or when data are ordinal, ranked or continuous and cannot be assumed to be normally distributed (Leedy and Ormrod, 2013). All tests were analysed at the 5% level of significance. Simple

statistics such as frequencies, mean scores, standard deviations, coefficient of variations were also used to provide meaningful information to these comparisons and to provide a description of the sample characteristics.

Using a matrix, the study highlighted the differences and similarities between critical enabling conditions in Bjatladi and Bela-Bela CPA. By linking these to the collective action experiences in each CPA, the differences in the conditions were used to explain the different outcomes observed in the two CPAs.

4.4 VARIABLE DESCRIPTION

This section provides a description of the variables measured in this study.

- i. The size of the resource system is measured as the total area of land restored to the CPA under the land restitution programme, that is, the size of the resource system that is managed and used by a distinct group of individuals (Ostrom, 1990).
- ii. Clarity of resource boundaries is measured as the existence of physical barriers and/or formal title deeds that clearly mark the resource system belonging to each CPA and clearly separate it from its surroundings (Ostrom, 1990).
- iii. Stationarity of resource units is measured as the degree to which resource units produced on CPA land in the 2012/2013 production year could achieve spatial movement on their own (Schagler et al, 1994).
- iv. Storability of resource units is defined as the presence of natural or manmade storage facilities for resource units produced on the CPA farms in the 2012/2013 production year (Schagler et al, 1994).
- v. Predictability of benefit flows is defined as the degree of confidence by which resource users could forecast the amount and frequency of tangible individual benefits gained from the CPA. Predictability is measured based on the consistency of the tangible benefits received by CPA members since 2003. Key informants were asked to describe the nature, quantity and time of individual benefits that their CPA members had received from the resource each year since 2003. Confidence for future benefits is considered to be higher if the frequency and quantity of those benefits has either increased or remained the same over time, and if the benefit was of a fixed rather than a temporary nature.
- vi. The size of the resource user group was defined as the number of people in the distinct group of people who collectively own, use and manage the resource in question (Ostrom, 1990). In this study, the group size is measured as the number of members in each CPA.
- vii. Boundaries of the resource user group were defined as the rules of entry and exit into the resource user group, in this case, the CPA (Ostrom, 1990; Tucker, 1999). The clarity of these

boundaries is measured by the ease by which one can either enter or exit the group, thus gaining access to the group benefits.

- viii. Shared norms of cooperative behaviour among resource users – was defined as the extent to which a group of people hold the same values and beliefs about how things ought to be done, for example attending CPA meetings. In this study, it is measured as the commitment to attending CPA meetings in 2013 and is calculated in two ways. First, an individual's commitment is calculated as the number of CPA meetings that a member reported to have attended in 2013 as a percentage of the total number of meetings the CPA held in 2013. Secondly, the first self-reported statistic is verified by asking respondents to report on how committed to meetings they think that other CPA members were in 2013.
- ix. Drawing from Putnam's (2000) definition and measurement of social capital as one's level of involvement in various informal networks and formal civic organisations, this study measures past successful experience in collective action as the number of types of voluntary organisations that a member belonged to in 2013. In an effort to understand an individual's decision to accumulate social capital, Glaeser, Laibson, & Sacerdote, 2002, found that 'organisation membership strongly predicts an individual's past efforts to work in the community to solve local problems'. Following Glaeser et al (2002), past successful experience in collective action is measured as the types of both formal and or informal organisations that a respondent was actively involved in during 2013. The respondent was presented with a list of twelve types of known formal and informal voluntary organisations including an additional option for any other organisations not mentioned in the list. This list was extracted from the Integrated Questionnaire for the Measurement of Social Capital (SC-IQ) list of 18 organisation types developed by Grootaert, Narayan, Nyhan-Jones & Woolcock (2004) to measure six dimensions of social capital, including the groups and networks component. The respondents were asked to indicate which groups they belonged to. Individuals' social capital was then calculated as the total number of organisation types they belonged to in 2013.
- x. An individual's level of interdependence on other CPA members was measured in two ways. Respondents were asked to indicate the number of times in 2013 when they (1). borrowed from or lent money to another CPA member, and (2). were asked by another CPA member to look after their property while they were away.
- xi. The four leadership qualities highlighted by Baland and Platteau (1996) that were used to measure appropriate leadership in this study are: (1) age, (2) level of education, (3) work experience, and (4) connection to a traditional figure.
- xii. The social characteristics included in the measurement of heterogeneity of resource users were age, education and employment status, while the economic characteristics measured

were income class and ownership of agricultural assets. Depending on the level of measurement of the characteristic, heterogeneity was measured using either the Coefficient of Variation (CV) or the Index of Qualitative Variation (IQV).

The CV is a statistical measure of dispersion of ratio level data points or frequency distributions that shows the extent of variation of data points in relation to their mean. It is calculated by dividing the sample standard deviation by the sample mean. The formula used to calculate CV is:

$$CV = S / \bar{x}$$

where S is the standard deviation and \bar{x} is the mean. The standard deviation (S) is a measure of variation derived from the variance. Variance is measured as the average of all squared deviations from the mean and the square root of the variance is the standard deviation and is calculated as:

$$S = \sqrt{\frac{\sum (x - \bar{x})^2}{N - 1}}$$

where $(x - \bar{x})$ = deviation from the mean, $\sum (x - \bar{x})^2$ = the sum of the squared deviations from the mean and N = number of scores.

CV values range from zero (0) to infinity (∞). When there is no variation in a data set, CV takes a value of 0. A CV value less than one indicates that there is relatively low variation, while a CV value greater than one indicates that variation is high.

The CV is an ideal statistic to use when comparing variation of two data sets with very different means or with different units. In this study, the CV was used to measure heterogeneity in age, livestock and agricultural equipment. Respondents are asked to indicate their age, and the number of livestock such as cattle, goats, sheep pigs, chickens and agricultural equipment – such as tractors, wheelbarrows, animal-drawn ploughs, and smaller implements such as hoes, shovels or spades owned by each respondent in 2013.

The data on agricultural assets were grouped into five different categories, namely transport equipment, small agricultural equipment, large agricultural equipment, small livestock and cattle livestock. The CV value was calculated for each category. The CV of agricultural assets was then calculated as the average CV of the five categories.

The IQV (Index of Qualitative Variation) is a statistic designed to measure variation in nominal and ordinal variables. It was developed by Mueller and Schuessler (1961). It is based

on the ratio of the total number of differences in the distribution to the maximum number of possible differences within the same distribution. The formula used to calculate IQV is:

$$IQV = K(100^2 - \sum P^2) / 100^2(K - 1)$$

Where K = number of categories and $\sum P^2$ = the sum of all squared percentages in the distribution. The four steps used to calculate IQV were:

1. Construct a percentage distribution.
2. Square the percentages for each category.
3. Sum the squared percentages.
4. Calculate the IQV using the formula for calculating IQV.

The IQV index ranges from 0.00 to 1.00. When all cases fall within the same category there is no variation, and therefore the index takes a value of 0.00. When there is maximum variation, that is, when cases are evenly distributed across categories, IQV takes a value of 1.00.

In this study, IQV was used to measure heterogeneity in income, employment status, education level and interests in sustainable management of the resource. Thereafter, the study made a direct comparison of the measures of dispersion in each CPA to determine if there is a difference in variation in the different dimensions.

- xiii. To determine interest in the sustainable management of the resource, each respondent was asked to indicate the number of years they consider appropriate for the CPA to have in mind when making decisions regarding the use of CPA land, assets and finances. Each respondent was presented with a multiple-choice type of response ranging from option (a) five years and below to option (e) 20 years and above. The responses from each CPA were tabulated to show the frequency and percent of respondents who were interested in either less than ten years or over ten year considerations. The researcher then used a chi-square test to compare the time-preferences of the respondents in the two CPAs.
- xiv. The rate of poverty in each CPA was measured using the Bristol Multi-Dimensional Approach developed by Gordon, Nandy, Pantazis, Pemberton & Townsend, (2003). In the Bristol Approach, the incidence of poverty is measured by an individual's access to basic human needs such as food, safe drinking water, sanitation facilities, health, shelter, education, and information. The present study measured deprivation in six dimensions, namely safe drinking water, shelter, information, sanitation facilities and energy. This study adopted the thresholds of deprivation used in the South African Living Conditions Survey of 2008/9

(SSA, 2011). These thresholds were originally developed by the Economic Commission for Latin America and the Caribbean (ECLAC) and the United Nations Children's Fund (UNICEF, 2007) and adapted to the South African context in the South African Living Conditions Survey of 2008/9 (SSA, 2011).

To apply the Bristol method in the present study, the following procedures were undertaken:

- 1) Six dimensions of basic human needs were identified (safe drinking water, sanitation facilities, education, shelter, energy, information).
 - 2) Using ECLAC-UNICEF definitions (Annexure 3) of thresholds of moderate or severe deprivation, a member's level of deprivation in each of the six dimensions was determined.
 - 3) An individual was rated as poor if he/she was deprived, either moderately or severely, on two or more dimensions.
 - 4) The rate of poverty in each CPA was calculated as the number of poor respondents divided by the total number of respondents.
- (xiii) In studies investigating the influence of factors affecting collective action outcomes in forest usage, the presence or absence of exit options in a forest user group is measured as the average off-farm income earned by forest users in each forest user group. This study measures exit option as the average monthly income earned from non-CPA activities in 2013.
- (xiii) Since the CPA regulations do not allow CPA beneficiaries to use restored land for the personal purposes of settlement, the degree of overlap between user group residential location and resource location could not be determined by the distance between members' residences and the CPA farms. Instead, it was measured as the frequency with which executive committee officials from each CPA physically interacted with the CPA land, assets, operations, and management in 2013.
- (xiv) To determine an individual's level of dependence on the resource, each respondent was asked to indicate how much the benefits from the CPA contribute to monthly household expenses. The results from each CPA were tabulated and a Chi-Square test used to compare the two groups' level of dependence on the resource.
- (xv) To determine members' perception of the fairness of allocation of CPA benefits the researcher first determined the respondents' knowledge and receipt of different types of individual benefits produced by the CPA by asking respondents to identify the type of benefits they received from the CPA in 2013. The researcher only sought respondents' perception of fairness in benefit allocation if a respondent had received any CPA benefit in 2013. To measure perception of fairness in benefit allocation, the researcher asked respondents to indicate their level of satisfaction with the manner in which the CPA shared its

benefits among members on a Likert-scale type question. A Mann-Whitney U test is used to compare the perceptions of respondents in the two CPAs.

- (xvi) To test the simplicity of the rules and the ease with which CPA members understand them, the study tested members' knowledge of six rules related to the use of the groups' land and assets using the following steps:
1. List six statements based on the CPA rules.
 2. Respondents were asked to indicate if each of the listed rules was true or false or if they did not know in the case of their CPA.
 3. Calculate a score of knowledge of rules for each respondent as the number of correct answers given by the respondents divided by the total number of questions answered by that respondent.
 4. Finally, compare the scores of the two CPAs using a Mann-Whitney U test.
- (xvii) Determining variations in the locally devised access and management rules was based on a qualitative analysis of CPA members' involvement in the decision-making processes of each CPA. To achieve this, the researcher gathered information from the key informants on the procedures, role players and role of CPA members in making and amending CPA rules and in making major decisions such as the use of CPA grants and funds, purchasing major acquisitions and allocation of benefits.
- (xviii) The existence of graduated sanctions is measured by the existence of punishments for crimes committed within the CPA that increase with the severity and frequency of the offences. To measure this variable, the study asked key informants to provide information on the number, types and frequency per offender of offences committed in the CPA in 2013 and the respective punishments for each offence.
- (xix) To determine the cost of adjudication, the researcher took into consideration the time, money, and effort members require to register a complaint in each CPA. A description of this process was available in the CPAs' constitutions and verified by key informants.
- (xx) The presence of monitors was determined by identifying if there were any individuals responsible for taking care of CPA farms, and assets and ensuring that outsiders and CPA members did not misuse the CPA assets and properties.
- (xxi) The level of accountability of monitors was determined by the number and frequency of ways in which the monitors reported to the CPA community on the condition of the CPA land, assets and finances, and the manner in which CPA land and assets were being used.
- (xxii) To determine the presence of restrictions on harvests that match the regeneration capacity of resources, the study asked key informants to describe how the CPA made decisions on the quantity and timing of harvest of resource units in relation to the ability of the resource to produce

again in the following season. Harvest restrictions were considered to match the regeneration capacity of the resource if the flow of resource units, that is, the quantity and timing of harvest of resource units each year had not had a negative impact on the ability of the resource to generate similar or better levels of resource units in the following year.

- (xxiii) To determine the cost of exclusion technology, key informants were asked to describe the measures taken by their CPA to ensure that outsiders cannot use their farmland and assets or harvest their resource unlawfully. In addition, key informants were asked to indicate what proportion of the total the exclusion costs constituted in 2013.
- (xxiv) This study measures the time for adaptation to new technologies related to the commons as the time lag between the transfer of land and the total control and management of farmland in each CPA.
- (xxv) The level of articulation with external markets is determined by the level of commercialisation in members' area of residence and the distance of members' residence from the nearest town/city.
- (xxvi) The rate of change in articulation with external markets was defined as how quickly the CPA executive committee has begun actively engaging with suppliers and buyers and decision making regarding these industry players of the CPA business since 2003.
- (xxvii) To determine the level at which central government undermine local (CPA) authority, key informants were asked to provide the following information:
 - a. Indicate if CPAs were legally recognised to make decisions regarding their farmland and assets on their own.
 - b. Describe the role of the government in the CPAs' decision-making since 2003, particularly in making and changing CPA rules, and the government's capacity to influence the decisions made by the CPA and CPA leadership.
 - c. Recall an incident(s) in which the government had undermined the decisions of the CPA.
- (xxviii) To determine if external (government) sanctioning systems were supportive of the local ones, the researcher collected information on the offences committed in the CPA and the punishments given to these offenders by the CPA and the government in 2013. To determine whether external sanctioning systems supported local ones, the study took into account whether the external system was designed such that acts considered criminal offences in the CPA were also recognised and penalised with similar or greater degree of severity in external court systems as in the CPA.
- (xxix) To determine if resource users received appropriate levels of external aid to compensate for conservation activities, key informants were asked to provide information on the nature, quantity and timing of any additional external aid given to the CPA and directly to CPA members by the government after the restoration of the CPA land.

(xxx) To determine if appropriation, provision, enforcement and governance were nested, the researcher examined the organisational structure guiding both the CPA and its business to see if there was any form of hierarchy in the management of these functions within the CPA and its business.

4.7 GENERAL SAMPLE CHARACTERISTICS

Seventy-five (75) respondents were interviewed. Eleven (11) questionnaires were discarded because they were incomplete, thus leaving a total sample of 64. Thirty-one respondents were members of the Bjatladi CPA and thirty-three from Bela-Bela CPA.

Table 2 presents the socio-demographic characteristics of the sample, namely the respondents' sex, age, highest educational level attained, employment status, income sources and income levels.

4.7.1 Sex of respondents

According to the General Household Survey (Statistics South Africa, 2013), in the South African black African population, there were more females (51.3%) than males (48.7%). Similarly, in this study, there were more females (59.4%) than males (40.6%).

4.7.2 Age of the respondents

The median age of respondents in the entire sample was 70.0 years; and for the Bjatladi and Bela-Bela CPA sub-samples respectively 71.3 and 70.0 years, suggesting that the population is aged. These results differ from the national median age of the Black African population of 24 years obtained in the South African 2011 Census (SSA, 2012a). The high median age of the sample is likely to be a result of the qualification criteria of the land restitution programme - that a beneficiary should be an individual that was displaced or a direct descendent of an individual displaced due to past racially discriminative laws such as the 1913 Natives Land Act and the 1950 Group Areas Act. Since these laws were implemented more than fifty years ago, it is highly likely that most of the beneficiaries would be elderly people aged 50 years or more.

4.7.3 Education profile

The education levels of respondents are presented in Table 2. The results indicate that the level of education among respondents was low with more than half (54.7%) only having either no formal or primary education only. The other 40.6% of the respondents have received secondary education and only 4.7% obtained tertiary education.

The study's findings correspond with those obtained in the 2011 Census. The 2011 Census results found that the level of education varied with age groups and was much lower in the older population than the younger ones. The proportion of individuals with no formal or primary schooling increased from 8.9 % in adults aged 20 to 24 years old, to 67.2% in adults above 80 years old. In the age groups ranging from 60 years and above, the proportion of individuals with no formal education, or primary school only, ranged from 51.6 % to 67.2%. The present study's findings fall within this range. The proportion of those with secondary education ranged from 27.4% in those aged above 80 years old, 46.7% in those aged 50 to 54 years to 82.7 % in those aged 20 to 24 years. The proportion of those with tertiary education ranges from 8.3% (20-24 years) and 5.3% (above 80 years).

4.7.4 Employment status, income sources and income levels

The results in Table 2 indicate that a large proportion (50%) of the sample respondents were either retired or pensioners. A further 32.8% were unemployed, only 7.8% were self-employed and 9.4% were engaged in formal work. The high proportion of pensioners was expected since a larger proportion of the sample (84.4%) is aged 60 years and above.

The majority of respondents (82.8%) reported that their main source of income is mostly grants or pensions. Only 3.1% and 4.7% obtain their income through a salary or from their business respectively. These figures correspond with those obtained from the General Household Survey (Statistics South Africa, 2013) which reported that 85% of those aged 60 years and above in Limpopo Province depended on a social grant.

The results also indicate that the majority of respondents (76.6%) rely on a monthly income of less than R2000 per month. Such low levels of income of below R2000 were expected since the majority of respondents rely on grants for income and almost a third (32.8%) are not gainfully employed.

Table 2: Socio-demographic characteristics of sample

Characteristic	Category	Name of CPA		Total	
		Bjatladi	Bela-Bela		
Gender	Female	21	17	38	59%
	Male	10	16	26	41%
	Total	31	33	64	100%
Age group	0-30	0	0	0	0%
	31-45	1	2	3	5%
	46-60	5	2	7	11%
	Above 60	25	29	54	84%
	Total	31	33	64	100%
	Mean (standard deviation)	70 (10.55)	70.3 (11.98)	70.2 (11.22)	
Education level	None	7	6	13	20%
	Primary	10	12	22	34%
	Secondary	13	13	26	41%



Characteristic	Category	Name of CPA		Total	
	Tertiary	1	2	3	5%
	Total	31	33	64	100%
Employment status	Pensioner/ Retired	17	15	32	50%
	Unemployed	8	13	21	33%
	Self employed	1	4	5	8%
	Formally employed	5	1	6	9%
	Total	31	33	64	100%
Income class	R0 -R1999	23	26	49	77%
	R2000-R4999	6	6	12	19%
	R5000 and above	2	1	3	5%
	Total	31	33	64	100%
Main Income source	Salary	1	1	2	3%
	Grant	21	21	42	66%
	Pension	5	6	11	17%
	Business	2	1	3	5%
	None/piece jobs	2	4	6	9%
	Total	31	33	64	100%

CHAPTER FIVE

RESULTS

This chapter presents and discusses the results obtained from the key informant interviews and survey described in the previous chapter. Section 1 discusses the characteristics of the resource system. Section 2 discusses the characteristics of the resource users. Section 3 discusses the relationship between the resource system and the resource users. Next, Section 4 discusses the institutional arrangements, and Section 5 discusses the relationship between the resource system and the institutional arrangements. Lastly, Section 6 discusses the external environment.

5.1 CHARACTERISTICS OF THE RESOURCE SYSTEM

5.1.1 Size of the resource system

In order for collective action to be successful, the resource shared and managed collectively must be a small area. The results show that the Citrus Estate owned by Bجاتلادي CPA measures approximately 5 973 ha while the farmland owned by the Bela-Bela CPA covers 6,724 ha. Considering that the Bela-Bela CPA has a larger area in comparison to Bجاتلادي CPA, the size of the resource system criterion appears to favour Bجاتلادي CPA. The theory thus suggests we should observe better outcomes in Bجاتلادي. However, in reality, we observe better outcomes in Bela-Bela CPA. This is because, in spite of its larger size, it uses 4 500 ha of its land for game farming leaving only 1 774 ha for crop farming. The larger size of Bجاتلادي CPA farmland reduces its ability to collect reliable and up-to-date information about the condition of the entire farm, particularly the unused portions, while this information is readily available for almost every part of each of Bela-Bela CPA's farms. Bela-Bela CPA can thus collect reliable up to date information about the condition of its farms, while Bجاتلادي CPA fails to do the same for many of the unused portions of its farm.

5.1.2 Resource boundaries

If collective action is to be successful, the boundaries of the resource system must be clearly defined. The results show that in both CPAs, this criterion is fully satisfied. In Bجاتلادي CPA, the boundaries of Zebediela Citrus Estate are clearly defined under the government-regulated land title deeds registered, with a physical fence surrounding the farm marking the boundaries. Physical fences and government-regulated title deeds also clearly outline each of the farms belonging to Bela-Bela CPA.

Clearly defined boundaries enable resource users to know what they own and manage, and to exclude outsiders from using their resource. Neither Bela-Bela nor Bجاتلادي CPA has experienced any theft of

farm property or produce by neighbouring communities, farmers or any outsiders. In addition, they have not encountered any dispute or actual encroachment on their land from neighbouring communities, farmers or any outsiders since 2003.

5.1.3 Stationarity and storage of resource units

Collective action is more likely to be successful when resource units are immobile, or mobile but can be stored for future use. Resource units refer to the physical benefits extracted from the collectively managed entities as described by literature (Wade, 1988a; Ostrom, 1990; Schagler et al, 1994). The resource units produced in Bela-Bela CPA were crops, namely beans, seed maize, sunflower, and livestock – namely cattle and wildlife – while those produced in Bجاتلادي CPA were citrus fruit, some macadamia, and cattle.

The results show that in both CPAs, the resources are not only stationary, but the benefits are also storable. In Bجاتلادي CPA, the citrus trees were stationary while the cattle, although mobile, were enclosed in cattle pens until they were ready for sale at the local auction. In Bela-Bela CPA, the crops were immobile while its cattle and wildlife herds, although mobile, were enclosed in cattle pens and within the fences of the game farm respectively.

The stationarity and storability of benefit flows in both CPAs allow them to gather good quality information about the condition of the resource units, although due to the presence of wildlife in Bela-Bela CPA the cost of gathering this information is higher. Bجاتلادي CPA monitors its citrus trees and cattle by simply walking through the plantation and cattle pens respectively. While Bela-Bela CPA crop fields and cattle herds are inspected the same way, wildlife is monitored by driving around the farm on a daily basis and a physical count is conducted by way of helicopter every five years.

5.1.4 Predictability of benefit flows

Collective action is likely to be more successful when resource users can easily predict the flow of benefits from the resource. In this research, predictability of benefit flows was measured as the consistency and permanency of tangible benefits generated by the CPA each year since 2003. Bela-Bela CPA's benefits consisted of a monthly food package consisting of four kilograms of vegetables, four kilograms of either game or beef depending on the availability, and 12.5 kilograms of maize-meal per member, skills training and employment. Bجاتلادي CPA benefits consisted of employment and rental income.

The results show that the benefits in Bela-Bela CPA were more predictable than in Bجاتلادي CPA. Since 2003, Bجاتلادي CPA only created temporary employment opportunities whose number and duration varied each year depending on the demand for labour. In addition, CPA members received

income ranging from as little as R500 to R2000 only every other year from the rental income shared amongst beneficiaries. In contrast, each Bela-Bela CPA member received a full food package monthly since the introduction of food packages in 2010. In 2012, ten Bela-Bela CPA members also received skills training and six of them were absorbed into the CPA farming units as permanent employees. Furthermore, in 2014 the CPA introduced a poultry project that permanently employs 50 CPA members.

5.1.5 How do resource system characteristics explain conflicting collective action outcomes?

The results suggest that the resource system characteristics that can explain the different collective action outcomes observed in the two CPAs are the size of the resource system and the predictability of benefits. This is in line with existing findings (Wade, 1988; Ostrom, 1990; Agrawal, 2001) that collective action is more likely to fail in larger resource systems than smaller ones because the larger systems are more difficult to monitor in terms of the physical condition of the resource, and to detect any cheating by outsiders or the resource users. Eliciting the cooperation of resource users is also more difficult when they cannot forecast the quantity and timing of benefits, and often results in overexploitation of the resource (Wade, 1988b). These findings imply that if collective action outcomes are to be more successful in larger resource systems, resource users may need to invest more resources and energy towards monitoring the physical condition of the resource, which can be achieved through employing more guards and/or using technology or have stricter rules of access and sanctioning to curb cheating.

5.2 GROUP CHARACTERISTICS

5.2.1 Group size

Collective action is easier when the group of resource users managing the resource is small. The results show that in 2014, Bjatladi CPA comprised 1200 members, while Bela-Bela CPA comprised only 242 members. Thus, Bela-Bela CPA performs relatively better than Bjatladi CPA on this criterion.

The size of the group has an effect on the ease with which the CPAs organise meetings, reach agreements and resolve internal conflicts. Since 2003, Bela-Bela CPA has organised and successfully held monthly meetings in which members discussed large purchase decisions and updates on the progress on CPA farms. Key informants also highlighted that the CPA had no difficulties in resolving internal conflicts. Bjatladi CPA, on the other hand, only holds two major meetings each year, namely the Information Day when members tour the farm, and the Annual General Meeting (AGM) to review the CPA's progress each year. According to key informants, the major constraint to holding regular

meetings were the high financial, time and effort costs required to organise such a large group of members. They also indicated that it was often difficult and time-consuming for this large group of members to reach a consensus and thus members only contributed towards extremely important decisions.

5.2.2 Group boundaries

Collective action is more successful when the boundaries of the group are clearly defined. In this study, the clarity of boundaries was defined as the extent to which the rules of entry and exit limit the increase in the group size. The results show that the group boundaries used in Bela-Bela CPA are more clearly defined than Bjatladi CPA boundaries. Membership of Bela-Bela CPA can neither be bought nor sold. To qualify as a member of the CPA, each member had to prove that they were originally displaced from the Bela-Bela farms under claim or that they are a direct descendent of such an individual. They were also required to make equal financial contributions towards the costs of administration incurred by the CPA throughout the process of the land claim. Once the land claim was settled in 2003, entry into the CPA was closed. Its constitution also clearly states that upon decease, one's membership passes on to only one other family member of the deceased's choice. Bjatladi CPA membership also can neither be bought nor sold and is based on individuals' ability to prove that they were dispossessed of their rights to the land claimed by the CPA or that they are direct descendants of someone who had been dispossessed. However, unlike in Bela-Bela CPA, Bjatladi CPA is still accepting, and does not have a closing date for accepting, new members. In addition, its constitution only states that once a member passes on their membership transfers to their family members. It does not define the minimum or maximum number or names of persons to replace the deceased member. In addition, none of the CPA members was ever required to contribute towards administration costs incurred by the CPA during the processing of the land claim.

Unclear group boundaries in Bjatladi CPA have led to the increase in its group size from 331 in 2003 to 1200 in 2014. As mentioned earlier, a larger group size has made it difficult and costly for the CPA to coordinate collective work and to resolve internal conflicts. Collective action may collapse if this growth in the group size continues unchecked. In contrast, Bela-Bela CPA group size has remained constant at 242 members since 2003 and the CPA has successfully coordinated collective effort and resolved conflicts. Thus, collective action can be expected to last longer because similar amounts of resources and effort will be required to coordinate collective action among members over time.

5.2.3 Shared norms

When group members share similar norms, that is, beliefs about how things ought to be done, collective action is easier. CPA members have the opportunity to influence decision-making and contribute towards the development of the CPA during CPA meetings. Members are encouraged to

attend these meetings, but are neither coerced nor penalised by the CPA for not attending. Thus, the norm of cooperative behaviour considered in this study was commitment to attending meetings. The level of shared norms was measured by two metrics: (1) Members' rate of meeting attendance, and (2) members' belief about the other CPA members' commitment to attending meetings.

In response to the first metric, the results show that members from either CPA showed similar levels of commitment to attending CPA meetings (Table 3). On average, Bjatladi CPA members attended 51% of the meetings held in 2013 while those of Bela-Bela CPA attended 44% of CPA meetings held in 2013. A Wilcoxon Mann-Whitney U test was conducted to determine whether the rate of meeting attendance was the same in Bjatladi and Bela-Bela CPA. The results ($U=390.500$, $p=0.374$) did not reject the null hypothesis, further confirming that the rate of meeting attendance of Bjatladi and Bela-Bela CPA members was the same.

Table 3: Number of CPA meetings attended in 2013

Number of CPA meetings attended per annum (percent)	Bjatladi CPA (N=28)	Bela-Bela CPA (N=33)	Total
0-25%	5 18%	11 34%	21 35%
26-50%	12 43%	10 31%	22 37%
51-75%	6 21%	5 16%	12 20%
76-100%	5 18%	6 19%	6 10%
Total	28 100%	32 100%	60 100%

In response to the second metric, the results in Table 4 show that members from both Bela-Bela CPA and Bjatladi CPA think that their fellow CPA members are very committed to attending CPA meetings. A Wilcoxon Mann-Whitney U test was used to test that Bjatladi and Bela-Bela CPA rated the commitment of their fellow members to attending meetings the same. The results ($U=492.500$, $p=0.637$) do not reject the null hypothesis, further confirming that members from both CPAs equally thought their fellow CPA members were very committed to attending meetings.

Table 4: Members' report on other members' commitment to meeting attendance

How committed do you think other CPA members are to attending meetings?	Bjatladi CPA (n=31)	Bela-Bela CPA (n=33)	Total (n=64)
Not sure	1 3%	1 3%	2 3%
Fairly committed	3 10%	2 6%	5 8%
Completely committed	27 87%	30 91%	57 89%
Total	31 100%	33 100%	64 100%

Sharing norms that encourage collective action created common ground through which members in both CPAs could work together for over ten years since 2003 because members shared a common understanding of what behaviour was acceptable and required of them in this collective effort. This factor could therefore not account for the different outcomes observed in the two CPAs.

5.2.4 Past successful experience in collective action (social capital)

Collective action is likely to be successful when resource users have previous successful experience in other unrelated activities requiring collective action. Following Putnam (2000), past successful experience in collective action in this study was measured by the number of types of voluntary organisations that an individual was a member of in 2013. The list of groups was taken from Grootaert et al (2004)'s questionnaire on social capital. A member's social capital was equated to the number of organisations they belong to. To investigate the difference between social capital in the two CPAs, these results were then cross tabulated with the CPA group belonged to.

The results show that Bela-Bela CPA members performed better than Bjatladi CPA members on this criterion (Table 5). On average, each member of Bela-Bela CPA belonged to three voluntary groups, while each Bjatladi CPA member belonged to two voluntary organisations in 2013. A Wilcoxon Mann-Whitney test was conducted to test if the level of voluntary participation in different types of collective groups was the same in both CPAs. The results ($U=353.500$, $Z=-2.200$, $p=0.028$) reject the null hypothesis, further confirming that past successful experience in collective effort was higher among members of Bela-Bela CPAs than Bjatladi CPA members.

Table 5: Voluntary organisation membership

How many types of voluntary groups were you an active member of in 2013?	Bjatladi CPA (n=31)	Bela-Bela CPA (n=33)	Total (n=64)
0	2 6%	0 0%	2 3%
1	9 29%	2 6%	11 17%
2	8 26%	14 42%	22 34%
3	9 29%	9 27%	18 28%
4	2 6%	5 15%	7 11%
5	0 0%	1 3%	1 2%
6	0 0%	2 6%	2 3%
7	1 3%	0 0%	1 2%
Total	31 100%	33 100%	64 100%

Past successful experience in collective action affects collective action through its impact on members' willingness to cooperate towards collective goals rather than pursuing individual goals, and on the costs of bargaining for a collective position in decisions made. To date, members from both CPAs have demonstrated their support for the collective goals through respecting each CPAs' collective goals of pursuing commercial rather than individual goals of either subsistence farming or subdivision of CPA land. However, according to key informants, reaching consensus in decision making during collective effort has been easy in Bela-Bela CPA, while it has been difficult in Bjatladi CPA.

5.2.5 Mutual interdependence among members outside collective effort

Collective action is easier when group members are mutually interdependent outside of the collective effort. In this study, this criterion was measured using two metrics: (1) number of times one either borrowed from or lent money to another CPA member in 2013, and (2) number of times one asked another CPA member to look after their property while they were away in 2013.

In response to metric 1 and 2, the study found that there is no difference in the levels of mutual interdependence among members from either CPA. The survey results showed that in 2013, members from either CPA did not borrow from or lend money to another CPA members, and neither did they look after or ask another CPA member to look after their house or property in their absence.

5.2.6 Appropriate leadership

Collective action is likely to be more successful when leadership is young, literate, connected to a traditional figure and is thus able to gain its followers' trust and confidence in its abilities to lead them towards achieving the intended collective goals. In this research, appropriateness of leadership was measured using four metrics: (1) age of leaders, (2) leaders' educational qualifications, (3) leaders' work experience, and (4) presence of a traditional figure in the leadership.

In terms of metric 1, 2 and 3, the results show that the leaders' demographic characteristics are more favourable for successful collective action in Bela-Bela CPA than in Bjatladi CPA (Table 6). The executive committee in Bela-Bela CPA is younger, more literate and has more professional work experience compared to the leaders of Bjatladi CPA. On average, Bela-Bela CPA leaders were aged 59 years, 45% had tertiary education and 64% had skilled professional experience. On the other hand, in the Bjatladi CPA, the average age of leaders was 72 years, only 10% had tertiary education and only 10% had skilled professional experience.

Wilcoxon Mann-Whitney U tests were conducted to test if the leaders of either CPA were of equal age, equal educational background and equal work experience respectively. In terms of age, the results ($U=66.000$, $p=0.013$) strongly rejected the null hypothesis, further confirming that the leaders of Bela-Bela CPA were younger than those of Bjatladi CPA. In terms of educational background, the results ($U=56.500$, $p=0.011$) also strongly rejected the null hypothesis, further confirming that Bela-Bela CPA leaders were more educated than Bjatladi CPA leaders. In terms of professional work experience, the results ($U=53.000$, $p=0.001$) also strongly rejected the null hypothesis, further confirming that Bela-Bela CPA leaders were more professionally skilled than Bjatladi CPA leaders.

Table 6: Demographic characteristics of executive committee

Characteristic	Category	Bjatladi CPA	Bela-Bela CPA	Total
Age group	0-30	0 0%	0 0%	0 0%
	31-45	0 0%	2 18%	2 6%
	46-60	3 14%	4 36%	7 22%
	Above 60	18 86%	5 45%	23 72%
	Total	21 100%	11 100%	32 100%
Highest level of formal education	None	0 0%	0 0%	0 0%
	Primary	9 43%	1 9%	10 31%
	Secondary	10	5	15

Characteristic	Category	Bjatladi CPA	Bela-Bela CPA	Total
		48%	45%	47%
	Tertiary	2 10%	5 45%	7 22%
	Total	21 100%	11 100%	32 100%
Previous work experience	Non-skilled	19 90%	4 36%	21 66%
	Skilled (professional)	2 10%	7 64%	11 34%
	Total	21 100%	11 100%	32 100%

In response to metric 4, Bela-Bela CPA performed better than Bjatladi CPA. In Bela-Bela CPA, the executive committee includes a traditional chief who acts as an ex-officio member of the committee, while Bjatladi CPA does not.

The appropriateness of leadership affects collective action through its impact on the capacity of leaders to organise collective action. Bela-Bela CPA leaders have created better rules of entry and exit into the CPA, maintained good relations between themselves and their strategic partner, implemented new projects, forged new relationships with the Agricultural Sector Education Training Authority (AgriSETA) to provide skills training for its members and developed an innovative idea of distributing benefits to members through a monthly food package. In contrast, rules in Bjatladi CPA are not clear, relations with its strategic partner have deteriorated and the CPA has not produced any permanent employment opportunities or tangible benefits except rental income of less than R1000 received every other year.

5.2.7 Social, economic and interest in sustainable management of resource homogeneity

Collective action is easier when resource users are homogenous in terms of their social background, economic status and interests in the sustainable management of the resource. The study uses the coefficient of variation (CV) to measure heterogeneity in ratio variables: (1) age, and (2) ownership of assets and uses the index of qualitative variation (IQV) to measure heterogeneity in nominal variables: (1) income class, (2) employment status, (3) education level, and (4) interests in sustainable management of the resource. Interests in the sustainable management of the resource were determined by the time frame that members preferred the CPA to allocate to making decisions on how to use CPA land, finances and assets.

The CV is a statistical measure of dispersion of ratio level data points or frequency distributions that shows the extent of variation of data points in relation to their mean. It takes positive values and has a

minimum value of 0.00 when there is no variation. A CV value less than one indicates that there is relatively low variation in a data set, while a CV value greater than one indicates that variation is high. IQV is a statistical measure based on the ratio of the total number of differences in the distribution to the maximum number of possible differences within the same distribution and ranges from 0.00 to 1.00. When all cases fall within the same category there is no variation, and therefore the index takes a value of 0.00. When there is maximum variation, that is, when cases are evenly distributed across categories, IQV takes a value of 1.00.

The results (Table 7) show that in terms of social characteristics, both CPAs' members were equally homogenous in age ($CV < 1$) and equally heterogeneous in education and in employment status ($IQV > 0.5$).

In terms of economic characteristics, the results (Table 8 and Table 10) show that Bela-Bela CPA ($IQV = 0.5$) members are more homogeneous in income than Bjatladi CPA ($IQV > 0.5$), but Bjatladi CPA members are more homogenous in total ownership of physical assets ($CV < 1$) than Bela-Bela CPA ($CV > 1$).

In terms of interest in sustainable management of the resource, the results in Table 9 and Table 10 show that there were higher levels of homogeneity among Bjatladi CPA members ($IQV < 0.5$) than Bela-Bela CPA ($IQV > 0.5$). However, Bjatladi CPA members preferred that the CPA land, assets and finances be used towards projects generating shorter-term benefits compared to Bela-Bela CPA members (Table 9). Thus, on this criterion, Bela-Bela CPA performed better than Bjatladi CPA.

Table 7: Members' age, education and employment status

Characteristic	Category	Bjatladi CPA	Bela-Bela CPA	Total
Age (years)	31-45	1 3%	2 6%	3 5%
	46-60	5 16%	2 6%	7 11%
	>60	25 81%	29 88%	54 84%
	Total	31 100%	33 100%	64 100%
Highest level of formal education	None	7 23%	6 18%	13 20%
	Primary	10 32%	12 36%	22 34%
	Secondary	13 42%	13 39%	26 41%
	Tertiary	1 3%	2 6%	3 5%
	Total	31 100%	33 100%	64 100%



Characteristic	Category	Bjatladi CPA	Bela-Bela CPA	Total
Employment status	Pensioner	17 55%	15 45%	32 50%
	Unemployed	8 26%	13 39%	21 33%
	Self Employed	1 3%	4 12%	5 8%
	Formally Employed	5 16%	1 3%	6 9%
	Total	31 100%	33 100%	64 100%

Table 8: Income classes and ownership of assets

Characteristic	Frequency	Bjatladi CPA	Bela-Bela CPA	Total
Monthly Income class (Rand)	0 -1999	23 74%	26 79%	49 77%
	2000-4999	6 19%	6 18%	12 19%
	5000 and above	2 6%	1 3%	3 5%
	Total	31 100%	33 100%	64 100%
Small agricultural equipment (wheelbarrows, spades, picks, shovels, forks)	0	0 0%	1 3%	1 2%
	1	1 3%	6 18%	8 13%
	2	5 16%	7 21%	14 22%
	3	21 68%	15 45%	39 61%
	4	4 13%	3 9%	11 17%
	5	0 0%	0 0%	5 8%
	6	0 0%	1 3%	7 11%
	Total	31 100%	33 100%	64 133%
Large agricultural equipment (tractor, animal plough)	0	31 100%	29 88%	60 94%
	1	0 0%	1 3%	1 2%
	2	0 0%	2 6%	2 3%
	4	0 0%	1 3%	1 2%
	Total	31 100%	33 100%	64 100%
Small livestock (sheep, goats, pigs, chickens, donkeys)	0	24 77%	15 45%	39 61%
	1-5	1	3	4



Characteristic	Frequency	Bjatladi CPA	Bela-Bela CPA	Total
		3%	9%	6%
	6-10	4	7	11
		13%	21%	17%
	11-20	1	7	8
		3%	21%	13%
	>20	1	1	2
		3%	3%	3%
Total	31	33	64	
		100%	100%	100%
Cattle	0	31	17	48
		100%	52%	75%
	1-5	0	6	6
		0%	18%	9%
	6-10	0	4	4
		0%	12%	6%
	11-20	0	6	6
	0%	18%	9%	
Total	31	33	64	
		100%	100%	100%

Table 9: Time preferences of members for decision making on CPA land, asset and finance use

Preferred time frame to be considered when making decisions on CPA land use	Bjatladi CPA	Bela-Bela CPA	Total
10 years and less	26 87%	9 29%	35 57%
More than 10 years	4 13%	22 71%	26 43%
Total	30 100%	31 100%	61 100%

Table 10: Statistics on heterogeneity among members

Heterogeneity in each characteristic	Bjatladi CPA (n=31)	Bela-Bela CPA (n=33)
Age (years) CV	0.2	0.2
Highest level of formal education (IQV)	0.89	0.9
Employment status (IQV)	0.81	0.83
Monthly Income Class (IQV)	0.61	0.5
Interest in sustainable management of CPA land (IQV)	0.46	0.82
Coefficient of variation for each asset type		
Transport equipment (car, motorcycle, bicycle)	1.76	1.22

Heterogeneity in each characteristic	Bjatladi CPA (n=31)	Bela-Bela CPA (n=33)
Small agricultural equipment (wheelbarrow, spade, pick, shovel, fork)	0.22	0.47
Large agricultural equipment (tractor, animal plough)	0	3.08
Small livestock (sheep, goats, pigs, chickens, donkeys)	2.36	1.15
Cattle	0	1.31
Average CV for all assets	0.87	1.44

Homogeneity in social, economic and interests in sustainable management of the resource have an impact on the long-term sustainability of the collective because they create a common understanding of the goals of the collective, and thus reduce the costs of bargaining and negotiating among CPA members towards achieving those goals. Bela-Bela CPA, which was more homogenous than Bjatladi CPA in terms of monthly income and interest in sustainable management of the resource, found it easier to develop and coordinate projects, and to reach agreements during meetings. Bjatladi CPA on the other hand, which was more homogeneous than Bela-Bela CPA in terms of physical agricultural assets, found it more difficult to develop and coordinate group activities or to reach agreements during its meetings than Bela-Bela CPA.

5.2.8 Levels of poverty

Collective action is easier when there are lower levels of poverty among resource users. This study uses the internationally recognised Bristol method – a multidimensional approach to measuring poverty based on the definition of absolute poverty agreed upon at the World Summit for Social Development as a condition characterised by severe deprivation of basic human needs. The Bristol approach identifies seven dimensions of basic human needs: shelter, water, sanitation, health, information, education, and nutrition and determined the thresholds for severe and less severe deprivation based on literature reviews. An individual was defined as poor if they were deprived of at least two dimensions of basic human needs. Statistics South Africa adopted the Bristol method to measure poverty in South Africa 2008/9 Living Conditions Survey (SSA,2011). To reflect the local context and availability of data, in its work on poverty measurement, the Statistics South Africa Living Conditions Survey included energy as an additional dimension. Following this work of SSA, this study also included energy as a dimension, but for lack of data excluded nutrition and health from its analysis. Therefore, this study measured poverty on six dimensions of basic human needs: (1) shelter, (2) safe drinking water, (3) sanitation facilities, (4) information, (5) education, and (6) energy.

The level of poverty in each CPA was measured as the proportion of members deprived on two or more dimensions.

The results show that Bela-Bela CPA performed better than Bjatladi CPA on this criterion (Table 11). The incidence of poverty in Bela-Bela CPA was lower (64%) compared to Bjatladi CPA (84%). A chi-squared test was used to test whether members of Bjatladi CPA and Bela-Bela CPA were equally poor. The results ($\chi=3.355$, $df= 1$, $p=0.067$, $n=64$) rejected the null hypothesis, further confirming that the rate of poverty is higher among Bjatladi CPA members than among Bela-Bela CPA members.

Table 11: Poverty rate in Bjatladi and Bela-Bela CPA

Poverty status	Bjatladi CPA	Bela-Bela CPA	Total
Not poor (deprived in one or no dimension)	5 16%	12 36%	17 27%
Poor (deprived in two or more dimensions)	26 84%	21 64%	47 73%
Total	31 100%	33 100%	64 100%

A higher rate of poverty in Bjatladi CPA has placed an increased demand on the CPA to produce near-term benefits from the resource compared to the demand on the Bela-Bela CPA resource. Thus, the chances of long-term sustainability of the resource and stability of the resource user group, and durability of the institutions governing them over time, are lower in Bjatladi CPA than in Bela-Bela CPA.

5.2.9 Exit options

Collective action is easier when resource users have fewer alternative sources of income or livelihood apart from the collective resource. Adhikari and Lovett (2006) measured exit options as the average off-farm income earned by forest users in each forest user group. This study also defines an exit option as the average monthly income earned by members outside of the CPA activities.

The results show that on average, members from the two CPAs had similar levels of alternative income outside the CPA (Table 12). In Bela-Bela CPA and Bjatladi CPAs, three-quarters of the members earned an average monthly income of between R0-1999 (74% and 79% respectively).

A Mann Whitney U test was used to determine whether there was a difference in the non-CPA average monthly income earned by members of Bela-Bela CPA and those of Bjatladi CPA. The results ($U=485.000$, $p=0.630$) do not reject the null hypothesis, further confirming that the alternative income outside the CPA was equal in the two CPAs.

Table 12: Average monthly income class excluding CPA income (2013)

Average Monthly Income Class (Rand) in 2013 excluding CPA income	Bjatladi CPA	Bela-Bela CPA	Total
R0 -1999	23 74%	26 79%	49 77%
R2000-4999	6 19%	6 18%	12 19%
R5000 and above	2 6%	1 3%	3 5%
Total	31 100%	33 100%	64 100%

5.2.10 How do resource user characteristics explain conflicting collective action outcomes?

According to the theory of collective action in NRM, resource user characteristics influence the ability of resource users to work together towards achieving a common goal instead of their individual ones. The results of the study suggest that the resource user characteristics that lead to different collective action outcomes in CPAs are the size and clarity of resource user group boundaries, appropriate leadership, and homogeneity of member interests in sustainable resource management, exit options and levels of poverty. These findings are highly consistent with many other findings in literature.

Many authors (Wade, 1988a; Ostrom, 1990; Araral, 2009) have found that smaller group sizes, albeit with a lower limit, are associated with to more positive collective action outcomes than larger ones. This is because smaller resource user groups are easier to organise, monitor and negotiate. The clearer group boundaries reduced cheating among resource users because resources users were more confident that by restricting their individual access to the resource in pursuit of the collective goal meant that they were the sole beneficiaries from the resource (Wade, 1988b). By having less defined group boundaries in Bjatladi CPA, this CPA has seen a larger increase in the number of beneficiaries than Bela-Bela CPA. The larger group size has made it more difficult for Bjatladi CPA to organise frequent CPA meetings for its members, and for members to reach consensus on agreements during these meetings, thus weakening the chances of long-term stability of the resource user compared to Bela-Bela CPA.

The results of this study support previous findings that planning resource use and negotiating decisions and therefore success in collective action, are easier for groups with higher levels of homogeneity of interests in the sustainable management of the resource, fewer exit options and lower levels of poverty. These findings suggest that to improve collective action outcomes, it may be necessary to educate and provide incentives for resource users to pursue long-term benefits from

sustainable management of the resource, while at the same time, introducing poverty-reduction measures to reduce resource users' demand for short-term benefits.

In terms of appropriate leadership qualities, the results also reinforce previous findings (Baland and Platteau, 1996; Meinzen-Dick et al, 2002) that more positive outcomes are likely to emerge out of collective groups led by a leadership that is more educated and more connected with the traditional elite. Higher education levels mean that leaders are likely to be more innovative and familiar with the existing external environment, such as how government departments work, than older leaders, while the connection to the traditional elite may make it easier for leaders to gain the respect and therefore cooperation of both the young and old group members. These findings suggest that encouraging CPAs to select the more educated individuals to lead their resource user groups in combination with a traditional figurehead may improve collective action outcomes. These findings also highlight the importance of training and building the capacity of leaders so as to ensure more beneficial and sustainable projects are implemented.

5.3 RELATIONSHIP BETWEEN RESOURCE SYSTEM CHARACTERISTICS AND GROUP CHARACTERISTICS

5.3.1 Overlap between user group residential location and resource location

Collective action is easier to manage when their resource users live close to the resource. In both Bela-Bela and Bjatladi CPA, members did not live on or close to the CPA farms. This was largely because these CPAs consist of individuals who were either directly displaced or who are descendants of those directly displaced from these commercial farms during the apartheid era. However, although members may not live directly on the farms, the CPAs' executive committee were directly involved in the daily operations on the farm. Thus, they are able to collect up-to date information about the farms' activities and condition on behalf of the CPA.

5.3.2 Level of dependence on the resource

Collective action is easier when there is a high level of dependence on the resource by the resource users. This study measured this criterion as the proportion of monthly household expenses contributed by CPA benefits for each CPA member.

The results show that Bela-Bela CPA performed relatively better than Bjatladi CPA on this criterion (Table 13). More than half (82%) of Bela-Bela CPA members reported that CPA benefits contribute towards more than half of members' monthly household expenses compared to only half from Bjatladi CPA (52%).

Table 13 Contribution of CPA benefits towards monthly household expenses

Contribution of CPA benefits towards monthly household expenses	Bjatladi CPA	Bela-Bela CPA	Total
Less than half	12	6	18
	48%	18%	31%
More than half	13	27	40
	52%	82%	69%
Total	25	33	58
	100%	100%	100%

A chi-square test was used to test whether CPA benefits contributed equal proportions towards monthly expenses of members from the two CPAs. The results ($\chi=5.909$, $p=0.015$, $df=1$, $n=58$) strongly rejected the null hypothesis, further confirming that Bela-Bela CPA members had higher levels of dependency on the resource compared to Bjatladi CPA members were low.

The level of dependence on the resource has an impact on collective action through its influence on members' incentive to protect the resource for themselves and for future generations. Thus, Bela-Bela CPA, where the level of dependence is higher, uses more effort towards improving farm structures and equipment while less effort has been directed to achieve the same in Bjatladi CPA.

5.3.3 Members' perception of fairness in allocation of benefits from the resource

Collective action is more likely to be successful when members perceive that the benefits from the resource are shared fairly than when such fairness is not perceived by members. The study measured this criterion by asking members how fairly they thought CPA benefits were shared among members. The results in Table 14 show that perceptions of fairness in benefit sharing were higher in Bela-Bela CPA than in Bjatladi CPA. On average, 79% of Bela-Bela CPA members thought benefit sharing was very fair compared to only 35% of Bjatladi CPA members who thought benefit sharing was very fair.

Table 14: Members' satisfaction with allocation of CPA benefits

Perception of fairness in sharing of CPA benefits	Bjatladi CPA	Bela-Bela CPA	Total
Very unfair	6	0	6
	19%	0%	9%
Somewhat unfair	14	1	15
	45%	3%	23%
Not sure	0	1	1
	0%	3%	2%
Somewhat fair	0	5	5
	0%	15%	8%

Perception of fairness in sharing of CPA benefits	Bjatladi CPA	Bela-Bela CPA	Total
Very fair	11 35%	26 79%	37 58%
Total	31 100%	33 100%	64 100%

A Mann-Whitney U test was used to test if members of the two CPAs shared equal perceptions of fairness with the manner in which benefits were shared in their CPAs. The results ($U=283.000$, $p=0.001$) reject the null hypothesis, further confirming that perceptions of fairness in benefit sharing were higher in Bela-Bela CPA compared to Bjatladi CPA.

When members do not perceive that benefits from the CPA are shared fairly, they are likely to either disregard the rules of the CPA in an effort to get the level of benefits that they think they deserve or stir up conflicts within the group regarding this perceived unfairness. Although no rules were broken in either CPA in 2013, this could explain the disagreements that were arising among members of Bjatladi CPA in 2013 while disagreements were absent in Bela-Bela CPA in that period.

5.3.4 How do the relationships between resource users and resource system explain conflicting collective action outcomes?

The results of this study support the findings of existing research that members' higher levels of dependence on the resource, and perceptions of fairness of benefit sharing increase, the chances of more positive collective action outcomes in NRM. According to Wade, (1988a), Ostrom (1990), and Mushtaq et al (2007), resource users that depend more on a resource are more likely to invest in the improvements, protection and effective management of that resource – since it is their main source of livelihood – than a user with lower dependence levels. Literature (Lahiff, 2007a; Songorwa, 1999; Jones, 2004) also highlighted that resource users are unlikely to continue cooperating or respecting CPA rules if they perceive that benefits from the collective resource are not divided fairly among themselves, thus leading to the disintegration of many collective efforts. These findings suggest that, it is important for leaders to work together with all its resource users to determine the allocation of benefits to the resource users to avoid future conflict. In addition, in groups with lower dependency on the resource may require stricter government regulations to ensure that they pursue the long-term sustainability of the resource in NRM.

5.4 INSTITUTIONAL ARRANGEMENTS

5.4.1 Rules are simple and easy to understand

Collective action is likely to be successful when the rules used are simple and understood by the resource users. The evidence that rules fit this criterion is when members know what is expected of them concerning the collective good (Baland and Platteau, 1996; Ostrom, 1990; Tucker, 1999). In survey research, knowledge is commonly tested by providing a list of statements to which respondents are asked to indicate if a statement is true or false. Then test scores determining the level of knowledge are calculated (Alreck and Seattle, 1995). Using information about the rules used in the CPA from the key informants, the study listed six true/false statements used in the surveys. Thereafter, test scores for each respondent were calculated.

The results show that knowledge of the rules was similar in Bela-Bela and Bjatladi CPA (Table 15). On average, each member in Bela-Bela CPA knew 60% of the rules asked, while each member of Bjatladi CPA knew 50% of the rules asked. A Mann-Whitney U test was used to test if members of Bela-Bela CPA and Bjatladi CPA's knowledge of rules were equal. The results ($U=425.500$, $p=0.214$) do not reject the null hypothesis, further confirming that knowledge of rules was the same in the two CPAs.

Table 15: Test scores on rules of CPA

Test score: Number of rules identified correctly	Bjatladi CPA	Bela-Bela CPA	Total
0	2 6%	0 0%	2 3%
1	0 0%	1 3%	1 2%
2	2 6%	3 9%	5 8%
3	17 55%	15 45%	32 50%
4	9 29%	5 15%	14 22%
5	0 0%	6 18%	6 9%
6	1 3%	3 9%	4 6%
Total	31 100%	33 100%	64 100%

5.4.2 Locally devised access and management rules

Collective action is more likely to be successful if the resource users devised the access and management rules in use. Key informants were asked to describe the process by which the CPA rules were made. In both Bela-Bela and Bjatladi CPA, the key informants reported that the procedure used to make decisions and enact rules in the CPA was by a majority voting process that included all its members. However, while the CPA members are the major decision making unit, the rules and decisions on land use in each CPA are made to fit the government's objectives for the CPA to continue using land solely for commercial agricultural purposes and to work with either a strategic partner or farm manager. This lowers CPA members' autonomy in decision-making.

In terms of the difference in the shareholding capacity of the joint companies responsible for managing the restored land, Bela-Bela CPA appears to have a higher level of autonomy in decision making than Bjatladi CPA. Bjatladi CPA only held 35% of the company shares while its strategic partner held 50% and the remainder of 15% belonged to the Farm Workers Trust. Bela-Bela CPA on the other hand held half (50%) of the company while the strategic partner had an equal shareholding of 50%.

Autonomy in decision-making influences collective action through fostering a sense of ownership and stewardship over a resource. This sense of ownership appears to be absent in Bjatladi CPA and has led to power struggles between the CPA and its strategic partner and division among CPA members. The power struggles have also led to decreased growth in production activities and benefits. As a result, these conflicts threaten the long-term sustainability of the resource, the relationship between the strategic partnership and the CPA and of the CPA.

5.4.4 Graduated sanctions

Collective action is likely to succeed when the punishments for breaking rules match the severity of the offence committed. However, in both Bela-Bela and Bjatladi CPA, there was no record of rule breaking in 2013 and therefore no experience with the use of sanctions. It was therefore not possible to determine whether the presence or absence of graduated sanctions had an influence on the different outcomes of collective action observed in the two CPAs.

5.4.5 Availability of low-cost adjudication

Collective action is likely to succeed when there are low-cost and accessible mechanisms for resolving disputes within a resource user group. Key informants were asked to describe the procedures required for one to register a complaint in either CPA. The process of registering and resolving disputes was the same in both Bela-Bela and Bjatladi CPAs. In both CPAs, members had

presented their disputes to the executive committee that was accessible to the CPA at any of the CPA meetings held throughout the year.

5.4.6 Accountability of monitors

Collective action is likely to be more successful when there are monitors present and these monitors are fully accountable to the resource users. This criterion was measured using two criteria: (1) presence of monitors, and (2) presence of mechanisms through which monitors were accountable to resource users.

The study found that the presence and accountability of monitors were the same in Bela-Bela and Bjatladi CPA. In terms of metric 1, both CPAs' guards were stationed at the CPA farms to make sure that there was no uncontrolled access or misuse of properties or theft of the CPA's moveable assets. Secondly, the executive committee also monitors the farms' daily operations on behalf of the CPA through its daily interactions with the strategic partner, farm workers, management and operations.

In response to metric 2, Bjatladi and Bela-Bela CPA use the same mechanisms to hold their monitors accountable to CPA members. The guards report to the farm management; which includes the strategic partner and the CPA executive committee. The CPAs both hold an annual general meeting (AGM) and an information day, both on which the executive committee updates members on the progress of farm activities. The CPAs kept detailed minutes of all its meetings, including executive committee meetings – and these were readily available from the CPA offices – conducted bookkeeping and the financial statements were audited. In addition, any major decisions were taken publicly through a majority vote of CPA members.

5.4.7 How do the institutional arrangements explain conflicting collective action outcomes?

The results showed that there was no difference in the simplicity of rules, or the accountability of monitors in the two CPAs, therefore suggesting that the different outcomes of collective action observed in the CPAs were a result of other factors besides these. The differences in the level of autonomy in decision-making could however explain the different levels of conflict experienced between the CPAs and their strategic partners and the level of conflict among CPA members. Firstly, by imposing that CPAs can only use restored land for commercial purposes, cannot subdivide land and must work with a strategic partner, CPA members did not get the opportunity to decide how they would use their land. Thus, these conditions or rules do not reflect the needs and desires of the landowners and in time, group members may become less willing to cooperate with the rules of the CPA and of the government. The level of autonomy in decision-making is further lowered when a CPA is not the major shareholder in the joint company with its strategic partner, which may lead to power struggles and strains the relationship between the CPA and its strategic partner.

5.5 RELATIONSHIP BETWEEN RESOURCE SYSTEM AND INSTITUTIONAL ARRANGEMENTS

5.5.1 Restrictions on harvest or extraction match the regeneration capacity of resources

Collective action is likely to succeed when the harvest restrictions match the regeneration capacity of the resource. This criterion was measured as the ability of the CPA to retain at least the same level of resource stock after harvesting each year. Information gathered from key informants revealed that neither Bela-Bela nor Bjatladi CPA had ever over-harvested from their resources since 2003.

In Bjatladi CPA, harvesting of citrus fruit is only conducted once the fruit is mature and ready for sale. The bags of oranges given to each CPA member on Information Day were taken out of this harvest. In Bela-Bela CPA, crops and vegetables were only harvested once they were mature and ready for sale or consumption for the monthly food packages. Game meat is only included in the food package during the hunting season when it was available, otherwise meat was obtained from the CPA cattle-herd. The CPA controls the number of wildlife hunted each year to prevent overstocking or depletion, by issuing hunting quotas to professional hunters and restricting hunting activities to the winter season when most animals are past their mating and gestation period.

Putting harvesting restrictions in place that match the regeneration capacity of the resource has made it possible for the resources in either CPA to continue generating benefit flows each year and thus promotes the long-term sustainability of the resource. Without evidence of resource sustainability, resource users might have had no incentive to continue cooperating by restricting their access to the resource. Since, there is no difference in this variable; it can therefore not explain the different collective outcomes observed in the two CPAs.

5.6 EXTERNAL ENVIRONMENT

a) Technology

5.6.1 Cost of exclusion technology

Collective action is likely to succeed where the cost of excluding outsiders from the resource is lower. Both Bela-Bela and Bjatladi CPA used the same methods to exclude outsiders from entering the farms through the physical fences surrounding the farms and paid security guards. Key informants from the two CPAs highlighted the fact that the guards' salaries formed an insignificant proportion of the total costs of running the farms. They also highlighted that, apart from the initial high costs of erecting new fences, the costs of repairing the fences over the years was minimal.

5.6.2 Time for adaptation to new technologies related to the commons

If collective action is to be successful, resource users must have time to adapt to new technologies related to the commons. In this study, this criterion was measured as the time lag between acquiring CPA land and the CPA managing the land on its own. However, both CPAs have been in partnership with a strategic partner since 2003 and are yet to manage their land on their own. Therefore, there was no difference between the time for adaptation to new commons technology between the two CPAs.

5.6.3 Low levels of articulation with the external market

Collective action is easier when members are less integrated with the external market. In this study, this criterion was measured using two metrics: (1) distance of members' residences from the nearest town or city, and (2) commercialisation of members' residential area.

The results show that there was no difference in the level of articulation with external markets between members of Bela-Bela and Bjatladi CPA. In response to metric (1) and (2), the results show that members' live in less commercialised areas located far from the city. The majority of Bjatladi CPA members reside in Zebediela; a group of 37 villages situated in the Capricorn District Municipality 63 kilometres south-west of Polokwane, the capital of Limpopo Province. Members of Bela-Bela CPA mostly reside in the rural villages of Dipetlwane and Makapanstad, located approximately 65km and 75km from Pretoria, the capital city of South Africa, respectively. These villages are characterised by dust roads and very few, small scattered grocery shops.

A low level of articulation with external markets is beneficial for collective action in that it depresses market pressures on leaders to choose to secretly sell or misuse CPA land, produce or assets, or the incentive for members to ignore the sanctions associated with cheating, stealing or misusing CPA property.

5.6.4 Changes in articulation with external markets

Collective action is likely to be successful when there is a gradual change in articulation with the external market. In this study, this criterion was measured as the time lag between the restoration of CPA land and the CPA taking full control in managing the CPA farms.

The key informant interviews revealed that the members' articulation with the external market in terms of commercial agricultural production and management was gradual in both CPAs. Prior to the land claim, members in either CPA had no experience in commercial agricultural production or any connection to large markets. Over the last ten years, these strategic partners have shared their knowledge, skills and expertise with the CPAs and introduced the CPAs to their products in various markets.

b) The role of the state

5.6.5 Central governments should not undermine local authority

Collective action is likely to be successful when central government does not undermine the local authority operating in the resource user group. The key informant interviews revealed that there has never been an occasion in either CPA when the state intervened with the decisions made by either CPA. In Bjatladi CPA, key informants highlighted that even though one of their company board members is a state representative, the CPA makes its own rules and decisions independently of the state. This state representative only plays an advisory role to protect the interests of the CPA and helps to resolve disputes between the CPA and its partners. In Bela-Bela CPA, the key informants also highlighted that the state has never undermined their decisions but has only played a supportive advisory role by providing extension services on issues related to production, capital and training opportunities. No state representative sits on their company board.

5.6.6 Supportive external sanctioning systems

Collective action is likely to succeed when the existing external sanctioning systems complement the ones used in the resource user group. However, since there has been no incidence of rule-breaking in either Bela-Bela or Bjatladi CPA, neither CPA has had any experience with the external sanctioning systems. Thus, this study cannot comment on the influence of external sanctioning systems on the different collective action outcomes observed in the two CPAs.

5.6.7 Appropriate levels of external aid to compensate local users for conservation activities

Collective action is likely to succeed when there is an immediate and adequate compensation for the conservation uses of the resources expected of resource users. In this study, this criterion was measured as the quantity of external aid given to individual members of the CPA immediately after restoration of CPA land.

The results show that Bela-Bela CPA provided its members with more generous compensation immediately after restoration of CPA land than Bjatladi CPA. As part of its restitution package, Bjatladi CPA received financial compensation worth about R17 million. The CPA invested 70% of these funds and shared only 30% amongst the 331 households or members at that time. Each member received about R15 000. Bela-Bela CPA received a grant worth R90 million as part of its compensation. In contrast to Bjatladi CPA, Bela-Bela CPA invested 30% of these funds and shared 70% of this grant among its members. Each member received approximately R90 000.

The presence or absence of immediate and appropriate levels of compensation for conservation activities affects the discount rates members apply on future benefits. In Bjatladi CPA where

compensation was lower, members still look forward to more immediate benefits, while in Bela-Bela CPA where immediate compensation was higher, members were willing to invest in more long-term benefits.

5.6.8 Nested levels of appropriation, provision, enforcement, governance

Collective action is easier when appropriation, provision, enforcement and governance functions are carried out at different hierarchical levels of management. This study defines this criterion as the presence of hierarchy in the CPAs organisation.

The results show that there was clearer hierarchy and more nestedness in the organisational structure in Bela-Bela CPA compared to Bjatladi CPA. In both Bela-Bela and Bjatladi CPA, the CPA elected an executive committee responsibility for managing the CPA and its business affairs. Some of these executive committee members were then elected to sit on the company's board of directors. These board members have a direct influence on the strategic and operational decisions made regarding the farm.

The difference between Bjatladi and Bela- Bela CPA was that, while all of Bjatladi CPA's operations were managed under a single company and board of directors, Bela-Bela CPA had three separate companies dedicated to the different farm enterprises governed by different boards: wildlife, crop and cattle. In addition, while Bela-Bela CPA had a clear organisational structure for each of its companies, Bjatladi CPA did not.

By organising the CPA in nested levels in their appropriation, provision, enforcement and governance, Bela-Bela CPA organised its business affairs in a manner that was clear and orderly and therefore easier to manage. In Bjatladi CPA, however, the lack of clear organisational structures in the company contributed to ineffective management and to conflicts between the CPA and its strategic partner.

5.6.9 How does the external environment explain conflicting collective action outcomes?

The results of this study reinforce previous findings that outcomes of collective action are likely to be more positive when resource users receive more appropriate levels of external aid to compensate for conservation activities and when appropriation, provision, enforcement and governance activities are nested. Baland and Platteau (1996) stressed that giving immediate and adequate compensation was important as it dissuaded resource users from requiring the collective effort to generate immediate benefits and thus, gave time for the conservation activities to mature and start bearing benefits. According to Ostrom (1990), without a clear and hierarchical structure to make appropriation,

provision, enforcement and governance less complicated in complex organisations, the management of such groups was likely to be difficult, unorganised, inefficient and therefore unsustainable.

These findings suggest that government may have an important role to play in helping collective action in NRM to produce more positive outcomes by advising resource users on the importance of developing good organisational structures and, the importance of immediate and adequate levels of compensation likely to suffice for each individual.

5.7 SUMMARY OF RESULTS ON ENABLING CONDITIONS

Table 16 presents a summary of the results obtained on the extent to which each of the conditions known to facilitate collective action in natural resource management compared in Bjatladi and Bela-Bela CPA.

Table 16: Summary of enabling conditions in Bjatladi and Bela-Bela CPA

Critical enabling conditions	Bjatladi CPA	Bela-Bela CPA
Resource characteristics (n=4)		
Small size	×	√
Clear boundaries	=	=
Low levels of mobility and storability	=	=
Predictability	×	√
Characteristics of resource users (n=10)		
Small size	×	√
Clear boundaries	×	√
Shared norms	=	=
Past successful experiences—social capital (RW, B&P)	×	√
Appropriate leadership—young, familiar with changing external environments, connected to local traditional elite (B&P)	×	√
Mutual interdependence among group members (RW, B&P)	=	=

Critical enabling conditions	Bjatladi CPA	Bela-Bela CPA
Homogeneity in income and interest in sustainable resource management (B&P)	×	√
Heterogeneity in ownership of assets	×	√
Few exit options	=	=
Low levels of poverty	×	√
Relationship between resource system characteristics and group characteristics (n=3)		
Overlap between user group residential location and resource location (RW, B&P)	=	=
High levels of dependence by group members on resource system (RW)	×	√
Perceived fairness in allocation of benefits from common resources (B&P)	×	√
Institutional arrangements (n=3)		



Rules are simple and easy to understand (B&P)	=	=
Locally devised access and management rules (RW, EO, B&P)	×	√
Graduated sanctions (RW, EO)	–	–
Availability of low-cost adjudication (EO)	–	–
Accountability of monitors and other officials to users (EO, B&P)	=	=
Relationship between resource system and institutional arrangements (n=1)		
Match restrictions on harvests to regeneration of resources (RW,EO)	=	=
External environment (n=8)		
Low-cost exclusion technology (RW)	=	=
Time for adaptation to new technologies related to the commons	=	=
Low levels of articulation with external markets	=	=
Central governments should not undermine local authority (RW,EO)	=	=
Supportive external sanctioning institutions (B&P)	=	=
Appropriate levels of external aid to compensate local users for conservation activities (B&P)	×	√
Nested levels of appropriation, provision, enforcement, governance (EO)	×	√
Changes in gradual articulation with external markets	=	=

Key: × less favourable, √ more favourable, = equally favourable, - not measurable

CHAPTER SIX

CONCLUSIONS AND RECOMMENDATIONS

By introducing the land reform programme over twenty years ago since 1994, the post-apartheid government also indirectly introduced the common property regime on highly valuable agricultural land. So far, there is overwhelming evidence suggesting that success in the collective action based land reform projects, which make up a significant proportion of landholding among land restitution and land redistribution beneficiaries, has not been universal. In fact, the majority of the projects have either failed to generate intended benefits; disintegrated over time or are struggling to overcome internal struggles among members or with strategic partners. A few, however, such as Bela-Bela CPA in Limpopo, have had positive experiences so far and could therefore carry valuable lessons for policy makers and other resource users that may improve common property based NRM across the country.

In order to understand the factors contributing to the different collective action outcomes observed in South Africa's land reform projects, this study conducted a comparative analysis of Bela-Bela CPA and Bjatladi CPA based on the theory of collective action. Bela-Bela CPA was used to represent successful common property based NRM, while Bjatladi CPA, which was also allocated high-value land in Limpopo Province, but in which collective action has deteriorated over the years, represented less successful common property based NRM. The theory of collective action in NRM used in this study currently consists of a list of over thirty enabling conditions for successful collective action in NRM. Beyond identifying these enabling conditions, the theory, however, remains inconclusive on the direction, magnitude and relationship between some of the factors due to the lack of a comprehensive data set that investigates all the enabling conditions in a single study.

In order to produce a comprehensive study of factors influencing collective action outcomes in NRM, this present study sought to analyse the entire set of enabling conditions listed in the theory. At the time of the study, there was no known record of empirical research conducted to explain different collective action outcomes in CPAs in South Africa using the theory of collective action in NRM. Therefore, the study sought to answer three questions:

1. To what extent do the variables known to facilitate collective action explain the collective action outcomes currently observed in Bjatladi and Bela- Bela CPA?
2. Which variables known to facilitate collective action explain the differences in the collective action outcomes currently observed in Bjatladi CPA and Bela-Bela CPA?

6.1 CONCLUSIONS

Overall, the study found that the enabling conditions for successful collective action in NRM were generally more favourable in Bela-Bela CPA than in Bjatladi CPA, confirming the assumptions of the theory of collective action in NRM that these enabling conditions are likely to be more favourable in successful collective action based NRM compared to failing collective action based NRM. Thus, this study concluded that the theory of collective action in NRM offers a comprehensive predictive and diagnostic tool by which an understanding of factors leading to different collective action outcomes and solutions to improve collective action in CPAs can be developed.

The study also concluded that the factors that may be constraining success in collective action based NRM in South African CPAs are:

1. a large size of resource,
2. high unpredictability of benefit flows,
3. large size of resource user groups,
4. lack of clearly defined group boundaries,
5. lack of appropriate leadership,
6. heterogeneity of interests in sustainable management of resources,
7. higher exit options,
8. high levels of poverty,
9. low levels of dependence on the resource among resource users,
10. low perception of fairness in benefit sharing,
11. low levels of autonomy in making access and management rules
12. lack of appropriate levels of external aid to compensate conservation activities, and the
13. absence of nested levels of organisation.

Resource user characteristics present the biggest challenge for successful collective action in CPAs. Firstly, where group sizes are large and members lack interest in the sustainable management of the resource and past successful experience in collective action, have many exit options, and experience high levels of poverty, bargaining among members may be difficult and costly, thus making collective action more difficult. Second, the absence of clear group boundaries because of the rules of entry and exit into a group may also present a major hurdle to collective action. Rules that are not properly devised, fail to protect the benefits from collective action and thus decrease the sustainability of collective action among members. Lastly, when the leadership of CPAs lack the necessary skills and attributes to foster growth and sustainability of the CPA and of the CPA's relationship with its strategic partner, collective action is likely to collapse. It is therefore important for members of the

executive committee to have some background in farm management or managerial experience so that they can contribute to the positive development of both the CPA and the strategic partnership.

Another major challenge is that the institutional arrangements that require CPAs to conduct commercial agriculture, to work with a strategic partner and not to subdivide restored land do not only limit the beneficiaries influence on decision making regarding the use and management of the resource, and therefore may not necessarily reflect the needs or desires of the beneficiaries. In addition, in circumstances where the CPA is not the major shareholder in the joint company managing the restored land, CPA members have less influence on decision-making, leading to power struggles between the CPA and their strategic partner. If indeed commercial farming is the best land use for restored land, beneficiaries must know and be willing to take the risks associated with commercial production; particularly that benefits may take much longer to generate. The external environment also presents major hurdles to the success of collective action where there is a lack of adequate compensation for conservation activities and lack of nested levels of appropriation. Without adequate compensation at the beginning of the project, resource users are less likely to grow a long-term interest in the sustainability of the resource, thus ignoring the need to protect the resource for long-term benefits. Since commercial farming is a high-investment industry, which is only likely to generate benefits in the long-run, collective action collapses when members' expectations for immediate gains are not realised. By lacking nested levels of organisation, particularly in large, complex farm operations, orderly division of labour among CPA leaders is impossible, thus leading to ineffective management. Thus, the importance of nested structural organisation cannot be ignored in all CPAs across the country.

Lastly, the resource characteristics also present challenges to achieving successful collective action through the size of the resource and the unpredictability of resource benefit flows. A large resource is more difficult to monitor, while unpredictability of resource flows decreases the incentive among resource users to constrain resource use for the collective good rather than individual benefit.

Finally, the study remained inconclusive on the direction of the influence of social and economic homogeneity on collective action. Hence, further study is still required to determine the direction of their influence and interactions.

6.2 RECOMMENDATIONS

Based on the findings, this study recommends that the theory of collective governance should be used to inform the planning stages of land reform for collective action based NRM in South African CPAs since it offers valuable insights on what makes some collective action successful in some CPAs more than others.

To strengthen collective action in land reform projects the study recommends that;

1. Since it may not be possible to limit the size of groups, especially in the case of land restitution, the state could intensify rural development activities, particularly through community projects. Such projects would not only create social capital in general but also generate income and create employment, thus reducing poverty and meeting the rural poor's immediate needs.
2. The state must also pay particular attention to building the capacity of CPA leaders through training, skills development and workshops used to share information among CPAs and with other leading commercial farmers in the agricultural industry.
3. The regulatory framework for new CPAs could be revised and adjusted so that it limits the growth of CPAs from unclearly defined boundaries by requiring that a deceased member of a CPA can only be replaced by one other member of the deceased's family, selected by that deceased member so as not to erode collective action benefits over time.
4. CPAs composed of large groups should be encouraged to have multiple committees within their executive committee to ensure that the executive committee is able to cover all its functions more effectively.
5. In the absence of adequate compensation, to help beneficiaries meet their immediate subsistence needs, land use planning of land awarded for restitution could also incorporate subsistence needs, while CPAs themselves should be encouraged to start their own community projects to complement farm incomes.
6. In order to incorporate the needs and desires of beneficiaries, a more participatory approach involving all stakeholders-land claim beneficiaries, the government and private sector should be used in designing a guide for the use and management of restored land without imposing the preconditions of commercial agriculture, no subdivision of land and working with a strategic partner.

Lastly, to clearly see the linkages and interrelationships between the different variables and the magnitude of their influence on collective action outcomes, which are important in developing a predictive theory, the study recommends that further comparative research be conducted on a larger sample of CPAs. This is especially important if this theory is to provide valuable insights into what makes collective action in NRM more successful in some circumstances than in others and, subsequently, to inform policy on how to improve collective action outcomes on the ground.

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APPENDICES

ANNEXURE 1: KEY INFORMANT QUESTIONNAIRE

Consent for participation in an academic research study by:

Miss Talent Ndlovu (083 946 3159)

Faculty of Agricultural and Natural Sciences

Department of Agricultural Economics, Extension, and Rural Development

Title: Understanding factors contributing to different outcomes of collective action in CPAs

Dear Respondent

You are kindly requested to participate in an interview that is being conducted for academic research purposes by Talent Ndlovu from the University of Pretoria.

The purpose of the study is to understand the factors contributing to differences in collective action outcomes observed in Communal Property Associations (CPAs) in South Africa. To do this, this interview will seek to understand more about the history, governance and performance of [name of CPA].

Participating in the survey involves answering a set of questions, which should take up approximately 45-60 minutes of your time.

- Your participation will be highly appreciated and your responses will be treated with strict confidentiality.
- No names or any other personally identifiable material will be used.
- Your participation is on a voluntary basis and there will be no negative consequences should you wish not to participate or to discontinue your participation anytime during the interview.
- The study will only be used for academic purposes and may be published in an academic journal. However, its recommendations may be useful to the policy makers to improve the implementation of the Land Restitution programme and to other Communal Property Associations to improve the governance of their natural resources.
- A summary of our findings can be made available to you on request.

If you would like to participate in the survey, please sign in the space provided below to indicate that:

You have read and understood the information provided above

You have agreed to participate in this survey on a voluntary basis

Respondent's signature:

Date:

Do you have any questions before we start?

1.0 Background Information

1.1 The Land Claim

What were the contents of the land claim?

When was the land claim lodged?

Who was in charge of the claim and who elected them to this position?

What were the general requirements for the land claim to be lodged?

How long did it take to gather all the requirements?

How many beneficiaries were recorded at that time?

Who organised the beneficiaries and how?

On what basis did one qualify to be a beneficiary? (What was the criterion for membership?)

Were there any exceptions made to these conditions and why?

How long did it take for the community to organise themselves before they lodged the claim?

How long did it take for the claim to be approved?

What challenges did the CPA face in lodging the land claim?

In their opinion, what factors contributed to its success and what were the disadvantaging factors?

What was the full compensation granted to [name of CPA]?

Role players in the Land Claim

Community, Government e.g. Department of Agriculture and NGOS

a) The Community

What role did the community play in the land claim CPA? E.g. lobbying and resource mobilisation

What was the general population size and age distribution of beneficiaries at that time?

Are there any records of their occupations, size of households, number of dependents, gender, tribe, language spoken, and reason for qualification (population structure?)

b) The Government

What was the role of government in negotiating the claim?

c) Others

Did the community receive any other assistance e.g. from NGOs or any other people or organisations

1.2 Governance Issues

Does a constitution exist?

How soon was it enacted after restitution?

How was it set up?

What was the management structure that was in charge and how was this decided?

What was the structure for resolving disputes e.g. those regarding membership? Were there any disputes that had to be resolved legally? If yes, what was their nature and how were they resolved? Has there ever been a repeated dispute of that nature. Is there any record of these disputes for future reference?

1.3 Details on compensation received

What was the nature of compensation? Monetary, land pieces, cattle etc

Location, size, climatic conditions, physical conditions,

Was the land fallow or was it already being used productively?

What was the nature and extent of existing land use functions and activities?

Financial statements (records of how much previous owner was making and how)

Number and source of employees

Number of cattle, wildlife etc found on that piece of land

Are the boundaries of land pieces well defined?

From which villages do beneficiaries come from?

What is their proximity to the villages to the CPA?

What monitoring mechanisms existed on the land? (e.g. guards)

2.0 Current Information

What activities are conducted on restored land? (Details of what, quantities, timing and quantities of harvests)

Current condition of the resource and assets

What other income generating opportunities/investments presently exist in the CPA?

2.1 Benefits from CPA projects

What are the tangible/direct benefits that the community receives?

Who and how many people benefit from projects?

Do members find the current sharing agreements fair/just?

Who decides on what proportion of projects will be used as benefits?

How are benefits divided amongst individuals?

How often are benefits shared?

Has number of beneficiaries changed over the years and why?

How has the proportion of benefits changed over the years, benefit per household/unit?

Record of improvements in the [name of CPA] villages (roads, electrification etc).

Record of new projects and extensions of existing projects that the CPA has introduced.

How many community members have been absorbed into projects as employees?

In which areas have they been absorbed?

Does CPA have goals to expand the community's involvement?

How does it intend to do this and what are the targets?

2.2 Financial Capital

Source of capital for projects.

How much do community, government, private sector contribute to financial capital?

2.3 Role Players

Who are the role players and what is their role in the CPA?

- Community
- Government bodies
- NGOs

a. The Community

What roles does the community play in the CPA? E.g. monitoring

What is their current demographic structure? (Use details from background section).

Does the community play an active role in resource mobilisation for e.g. monitoring (paying guards) or investment in maintenance or contributing labour resources (free of charge e.g. if community members themselves take turns to guard resources).

b. The government

Which government departments does the CPA interact with?

Is it required by the law or voluntarily?

What is the role played by each of these departments?

Is the government involved in the overall decision making process?

Does government have to approve projects before they can commence or are changed? (What is their capacity in decision making and the nature of their interactions?)

c. The private sector

Is the CPA in partnership with private sector?

What is the structure of their partnerships? (Tenure length and arrangements, %benefits, decision making power, targets, etc.)

How were or are these partners selected (recommended by government or sought for by CPA)?

How long have these partnerships been operational?

Is there room to fire or hire new partners?

d. Tertiary sector/research institutions

Collect information about involvement/engagement of research institutions in generating the scientific base for natural resources management.

2.4 Governance and Institutions developed by CPA

Has leadership changed over the years and how often does it change?

What are the rules that have been developed to avoid open access to land?

What is the chain of command for suggestions and grievances used for this CPA?

Records of disputes, grievances since commencement of project

How many new members have been added to the CPA since its commencement and why?

Has any part of the constitution changed over the years and why?

What are the major challenges that the CPA is facing?

What changes have been implemented in the running, management and governance of different projects since the establishment of the CPA?

2.5 Information dissemination

How is new information concerning the projects shared with members, that is, what methods are used to disseminate information? – written, word of mouth, formal meetings.

How are formal meetings organised? – written, word of mouth

How many meetings are held each year?

What is the general rate of attendance compared to total membership?

Are the meetings scheduled as per need assessment (demand) or by supply side (only management calls for meetings) ?

What methods are used to make decisions on new projects, for example voting, chairman decides alone, management decides alone – according to the constitution?

Can the community decide to fire or instate personnel at their will?

Do they have access to the records and information about the projects that the CPA is engaged in?

What is the overall governance structure of the CPA? Board of Trustees, Executive Committee, the development forum etc (what are the institutional arrangements)?

What are the rewards or penalties of not complying with local formal and informal rules and how are these communicated with the community?

Are the [name of CPA] people religious?

What role do religious leaders have to play in the CPA?

What are the religious groups, which one is dominant and what are characteristics of the dominant religious group that facilitates natural resource management?

2.6 Gender Issues

How is gender mainstreamed into project development, management, and benefit structures?

How many women leaders does the CPA have?

How many women trainees are taking part in the new trainee programme?

Are there any activities aimed at encouraging women participation?

2.7 Infrastructural environment

Number and condition of roads, clinics, buildings, housing, access to water and electricity, sources of energy, major economic activities e.g. agriculture, and what types of agriculture, major highlights of the area.

ANNEXURE 2: INDIVIDUAL QUESTIONNAIRE

Consent for participation in an academic research study by:

Miss Talent Ndlovu (083 946 3159)

Faculty of Agricultural and Natural Sciences

Department of Agricultural Economics, Extension, and Rural Development

Title: Understanding factors contributing to different outcomes of collective action in CPAs

Dear Respondent

You are kindly requested to participate in a survey that is being conducted for academic research purposes by Talent Ndlovu from the University of Pretoria.

The purpose of the study is to understand the factors contributing to differences in collective action outcomes observed in Communal Property Associations (CPAs) in South Africa. To do this, this survey will seek to understand more about the rules of this CPA and the relationships between CPA members and with their leadership.

- Participating in the survey involves answering a set of questions, which should take up approximately 45-60 minutes of your time.
- Your participation will be highly appreciated and your responses will be treated with strict confidentiality.
- No names or any other personally identifiable material will be used.
- Your participation is on a voluntary basis and there will be no negative consequences should you wish not to participate or to discontinue your participation at any time during the interview.
- The study will only be used for academic purposes and may be published in an academic journal. However, its recommendations may be useful to the policy makers to improve the implementation of the Land Restitution programme and to other Communal Property Associations to improve the governance of their natural resources.
- A summary of our findings can be made available to you on request.

If you would like to participate in the survey, please sign in the space provided below to indicate that:

You have read and understood the information provided above

You have agreed to participate in this survey on a voluntary basis

Respondent's signature:

Date:

Do you have any questions before we start?

The information required for this survey should relate to the period **2012/2013**. If there is anything that is not clear to you or if you need more information at any time during the interview, please feel free to ask.

SECTION A: GENERAL INFORMATION

Province: District: Suburb/Village:
.....

Enumerator's Name: Interview Number:

Date of Interview: Starting time of interview:

SECTION B: AWARENESS OF GOVERNMENT REQUIREMENTS AND CPA RULES

The purpose of this section is to establish your knowledge of the rules set by the government and by the CPA, which regulate the use and management of the land restored to the CPA under the Land Restitution programme.

1. The table below contains a list of rules. As I read out each rule, please indicate whether it is true or false or if you do not know, in the case of this CPA.

[Enumerator: Write in the space provided. Use T-TRUE, F-FALSE, D/K – DON'T KNOW]

RULE	T/F,D/K
Every CPA which receives land under the Land Restitution programme is required to work with either a strategic partner or a farm manager in developing that land.	
The CPA is forced to work with a strategic partner or farm manager of the government's choice.	
The CPA is required to submit a comprehensive business plan to the Department of Agriculture before it carries out any activities on the restored land.	
The CPA is not allowed to build personal houses on the land restored to the CPA.	
Any CPA member can visit the farms owned by the CPA at any time to inspect if the workers are doing their jobs properly.	
CPA members can use the tractors on the CPA farm for their personal use.	

SECTION C: PERCEPTIONS ON MANAGEMENT

The purpose of this section is to obtain information regarding your opinions on various issues relating to the management of CPA land, its physical assets and its business activities.

2. This CPA is working with a:

- a) Strategic partner b) Farm manager c) None of the above

3. If yes, how long is the partnership or contract for? years *[IF DON'T KNOW, PLEASE INDICATE ON SAME SPACE]*

4. Does this CPA have an Executive Committee?

YES	NO	DON'T KNOW
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5. In your opinion, which of the following time frames should the CPA as a whole have in mind when making decisions on how CPA land should be used? Select one answer which most closely describes your opinion.

- A. 5 years and below B. 6 to 10 years C. 11 to 20 years D. More than 20 years

SECTION D: INTERACTION, GROUPS, NETWORKS

The aim of this section is to obtain information regarding your interactions with other members of the CPA and with other members of the society in general.

6. How many... *[Read out the statement]...? Fill in appropriate response in the table below.*

CPA members are there in this household?	
CPA members do you have immediate or extended family ties with including those in your household? <i>[Give examples like uncle, aunt, grandparent, child, brother, sister. This list is not exhaustive]</i>	

7. In the last year (12 MONTHS), how many times have you
- a. Lent money to another member of the CPA? times
- b. Borrowed money from another member of the CPA? times

8. I will now read out a list of groups or organisations, networks, and associations. It includes both formally organised groups and just groups of people who get together regularly to do an activity or talk about things.

As I read out this list of groups, please tell me if you belong to such a group.

[Enumerator: Complete the table. Begin with type of group]

Type of Organisation or Group	Are you a member? Y=YES, N=NO
Farmer group or Cooperative	



Traders or Business Association	
Professional Association (e.g. doctors, teachers, veterans)	
Trade Union or Labour Union	
Neighbourhood/Village committee	
Religious or spiritual group	
Burial society or festival society	
Finance, credit or savings group (e.g. Stokvel)	
Education group (e.g. school committee)	
NGO or civic group (e.g. Red Cross)	
Youth group	
Political group or movement	
Other (Specify)	

SECTION E: INVOLVEMENT IN THE CPA

9. How many CPA meetings have you attended in the last twelve months?
10. How committed do you think other CPA members are in attending CPA meetings?
- a. Not committed at all
 - b. Not so committed
 - c. Not sure
 - d. Fairly committed
 - e. Completely committed

SECTION F: CONTRIBUTION OF CPA FOOD AND INCOME TO HOUSEHOLD

[Circle or fill in correct response]

11. I will now read out a list of possible benefits from the CPA. Please indicate by saying YES or NO if you have received any of these benefits from the CPA in the last twelve months?

Benefit	Received [Y=YES, N=NO]
Food	
Income (Rent)	
Employment	
Any skills training	

[If respondent answers YES to any of the options (a), (b) in Question 11, then proceed to Question 12. If respondent does not answer YES to either option (a) or (b) in Q11, then skip Q.12 and go to 13]

12. To what extent does the food and/or income (rent) which came from the CPA in the last year cover your household needs? Select one answer which most closely describes your opinion.

- a) Negligible proportion
- b) Less than half
- c) Not sure
- d) About half
- e) More than half

13. I will now read a statement regarding the benefits generated by the CPA. After I read it out, indicate your level of satisfaction with each statement by telling me if you are ... [Read out the scale]

1=Very dissatisfied

2= somewhat dissatisfied

3= Not sure

4= somewhat satisfied

5= Very satisfied

Statement	Score
The manner in which benefits are shared within the CPA?	

[Enumerator: if respondent is dissatisfied (i.e. scores 1 or 2) in question 23, then go to Q24. If otherwise, skip next Q24 and go to Section F: Q25]

If dissatisfied in any way, give a reason why?

.....

.....

.....

.....

.....

SECTION G: DEMOGRAPHIC INFORMATION

The purpose of this section is to gather more information about you and about your household. Please select the response which best describes your situation.

[Enumerator: Complete the table below. Use the key below the table to guide you. Cross or fill in the appropriate response(s).]

14.

Sex		Age (yrs)						
M	F							
Education level		Employment Status			Sources of Income			
N	S	FE	UE	ST	SA	GR	PN	BU
P	T	SE	RT		RE	OT(Specify)		

*Key

* M= male

F= female

*N= no formal education

P= primary

S= secondary

T= tertiary

* FE=formally employed

SE=self- employed

UE= unemployed

RT= retired/pensioner

ST= student

*SA=salary

RE=remittances from relatives

GR=social grant

PN= pension

BU= income from business

OT=Other (Specify)

15. If employed, specify occupation (e.g. teacher, farmer):

16. Rate your personal sources of income in order of importance with 1 being for the most important, and 5 being the least important. [Use the spaces provided below the income options in the previous table on this page]

17. What is your personal average monthly income?

- a. R1999
- b. R2000 - R4999
- c. R5000+

18. Relationship to household head

19. Have you received any formal farmer or agriculture-related training?[Circle] YES / NO

[If respondent says YES, go to Q20. If NO, skip next question 20 and go to Q21]

20. Details about formal farmer or agriculture-related training

- a. Nature of training
- b. Year received training

21. I will now ask you to provide a few more details regarding the size, ages and employment status of members of this household including yourself. *A household member is anyone who has stayed in this household for at least four nights a week for the last four weeks (month).

Fill in the details in the table provided below. All responses must be numbers

[Enumerator: Begin each question by saying: 'What is the number of ... [read out the question]'

Question	Response
People living in this household including yourself	
Children below 16 years old	
Adults aged between 16 and 64 years of age	
Adults aged 65 and above	
Employed	

22. Which of the following describes your housing most closely?

[Enumerator: complete the table below. Use the key below the table to guide you. Cross or fill in the appropriate response.]

Type of main dwelling	CB	TD	ID
	Other (Specify)		
Tenure	O= owned	R= Rented	
	Other (Specify)		
Number of rooms excluding toilet and bathroom			

Key * CB = Concrete block structure including house, flat, townhouse

TD= Traditional dwelling/hut made of traditional materials

ID= Informal dwelling/ shack

Type of toilet		Main source of drinking water		
FL	PI	PT	BH	CS
BK	NONE	RV	OT (Specify)	
Main source of fuel for lighting				
EL	GS	PF	SO	WD
CL	AD	OT (Specify)		

Key

- * FL = Flush PI= Pit latrine/ Blair BK= Bucket
- * PT = Own piped tap BH= Own Borehole/ Covered well
- CS = Communal/ public source - tap/ covered well/borehole
- RV = Open well, river, stream
- * EL = Electricity GS= gas PF= paraffin SO= solar WD= wood CL= coal
- AD = animal dung OT= other (specify)

23. I will now read out a list of items. Please tell me how many of each of these items this household owns at the moment.

Car	
Motorcycle	
Bicycle	
Television	
Radio	
Telephone (cellphone and landline)	
Computer with internet	
Electric stove (standing)	
Fridge/ freezer	
Chickens	
Sheep	
Goats	
Cattle (cows)	
Other livestock (specify)	
Tractor	
Wheelbarrow	
Animal drawn plough	
Other agricultural equipment (specify).....	

SECTION H: ASSESSMENT OF THE INTERVIEW

In this section, we would like you to tell us what you think about the interview which you just had.
(Cross the appropriate response)

How easy was it to understand the questions in this interview?

Difficult	Average	Very easy
-----------	---------	-----------

How would you rate the length of the interview?

Too long	Just alright	Short
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ANY OTHER COMMENTS:

.....
.....
.....
.....
.....
.....

End time of Interview:

Thank you so much for your time. We appreciate your participation in this survey.

For any questions or comments regarding this survey, please contact our study leader, Dr E.D. Mungatana on tel. +27 124 203253 or e-mail: eric.mungatana@up.ac.za.

ANNEXURE 3: DEFINITIONS OF THRESHOLDS OF MODERATE OR SEVERE DEPRIVATION

Dimension	Indicators	Moderate deprivation	Severe deprivation
Shelter	1. Ratio of persons per room excluding bathroom and toilet	Overcrowding three or more but less than five people per room	Four or more people per room
	2. Wall material	Traditional housing – mud walls (CODE=3)	Informal dwellings (CODE=3)
Drinking water	1. Piping	Improved source which is not piped {own borehole/ covered well}	Unimproved source of water {flowing water, river, stream, open well}
	2. Supply	Improved source supply from outside dwelling {communal tap/ covered well/ borehole}	
Energy	1. Source	Without electricity for lighting BUT =(GAS, PARAFFIN, SOLAR)	Without {electricity, gas, paraffin or solar} for lighting <i>but</i> =(WOOD, COAL, ANIMAL DUNG, NONE)
Sanitation	1. Sewer connection	Using facilities other than flush toilet	No access to any form of toilet of any kind
Education		Highest level of education is primary school and currently not attending school	No formal schooling
Information	1. TV	Only one component is available	All components are missing
	2. Radio		
	3. Telephone (mobile or landline)		
	4. Computer with internet		

Note: Definitions adapted from South Africa's 2009 Living conditions survey Men, Women and Children report. Definitions originally from Gordon et al, (2003) and UNICEF (2007)