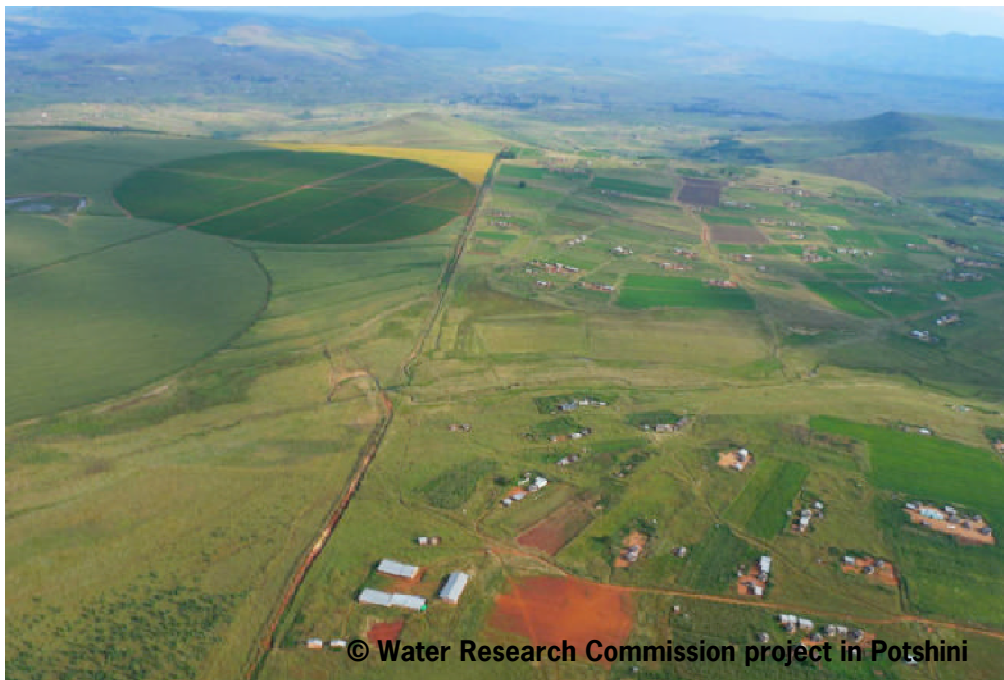


Devolving resources and power in a context of land and water reform

Organising practices, resource transfers and the establishment of a WUA in the Little Thukela catchment, South Africa



© Water Research Commission project in Potshini

M.Sc. Thesis by Linda Estelí Méndez Barrientos

November 2010

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Master thesis Irrigation and Water Engineering submitted in partial fulfillment of the degree of Master of Science in International Land and Water Management at Wageningen University, the Netherlands

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Abstract

A significant international drive for comprehensive reforms of the institutional framework for the management of natural resources, with an emphasis on devolving power and decentralizing government decision making, has been at the core of development policies in the last two decades. The South African water and land reforms show that institutional and resource devolutions are highly complex and conditioned by contradictory economic interests. This MSc thesis research focused on identifying the challenges and difficulties in the creation of inclusive water institutions for the decentralized and equitable management of water in the Little Thukela catchment. The research focused on the main actors of the recently established Water User Association (WUA): (white) commercial farmers and two (black Africans) communities – Potshini and Amaswazi – to understand how land and water reform has been addressed, managed, circumvented, and/or delayed. Studying both sides as well as land and water reform implementation processes allowed a better understanding of the opportunities, constraints and the adequacy of the present institutional decentralization processes in the catchment. The thesis concludes that in rural communities, new hybrid institutional arrangements to manage devolved land and water resources are complex, ambiguous, conflictive and insufficient. Transfers of land and water resources have not yet transformed the livelihoods of historically disadvantaged individuals (HDIs) nor their participation in the WUA, which is dominated by commercial farmers. In short: the nature of water reform that depends on land reform and on the institutional structures for its implementation faces complex challenges that cannot be solved just by devolving resources and/or decentralizing government decision making.

Keywords: Land, water, transfers, reform, WUA, commercial farmers, rural communities, HDIs, Amaswazi, Potshini, South Africa.

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Abbreviations

BBE	Black Economic Empowerment
BBBEE	Broad Based Black Economic Empowerment
CLRA	Communal Land Rights Act (of 1994)
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
CPA	Communal Property Association
DA	Department of Agriculture
DLA	Department of Land Affairs (before 2009)
DRDLR	Department of Rural Development and Land Reform (former DLA)
DWA	Department of Water Affairs (former DWAF)
DWAF	Department of Water Affairs and Forestry (before 2009)
HDI	Historically Disadvantaged Individuals
IB	Irrigation Board
ICM	Integrated Catchment Management
IWRM	Integrated Water Resources Management
KZN	KwaZulu-Natal Province
LRAD	Land Reform for Agricultural Development
MANCO	Management Committee of the WUA
NGO	Non Governmental Organisation
NWA	National Water Act (of 1998)
NWSA	Water Service Act (of 1998)
SLAG	Settlement Land Acquisition Grant
SLT	Smahla Land Trust
TA	Tribal Authority
WAR	Water Allocation Reform
WIS	Winterton Irrigation Settlement
WMA	Water Management Area
WUA	Water User Association
ZAR	Zuid Afrika Rand

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My passion for studying equity and the reforms that seek -at least on paper- to restructure societies has its roots back home, in Nicaragua. I was born at the end of the 80s, when the revolutionary dream to construct a new Nicaraguan society was at the edge of being lost and betrayed. My parents, who were highly educated professionals and former revolutionary supporters, transmitted their ideologies and the relevance for their lives to have participated in the transformation of what they perceived an unjust society. Raised with these messages and consequently exposed to poverty and social stratification that is at its most visible in Managua, I developed an undying interest to understand the role of public policies to transform contrasting societies. This thesis is the start of this personal-professional exploration, product of this funded interest.

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Chapter 1. The Research

1.1. Introduction

A significant international drive for comprehensive reforms of the institutional framework for the management of natural resources has been at the core of development policies in the last two decades. Devolving power and decentralizing government decision making has been a key policy strategy aimed at unlocking the potentials for economic development in localized regions (Oates, 1972, 1993; Bahl and Shyam, 1986; Alesina and Spolaore, 2003). It has been thought that effective democratic decentralization is contingent on local participation (Uphoff, 1986; World Bank, 1996; Ribot, 2001) though cases like South Africa demonstrate that institutional and resource devolutions are highly complex and problematic.

In most water reform proposals, three important issues feature prominently: water rights, service agreements and river basin management or integrated catchment management (ICM) widely promoted under the banner of Integrated Water Resource Management (IWRM) (Molle, 2004; Waalewijn *et al.*, 2005). Influential concepts such as IWRM in policy making “are not merely neutral or scientific; they do not emerge by chance but, rather, are the emanation of complex webs of interests, ideologies and power” (Molle, 2008:132). As such, ICM implementation is a political process (Wester *et al.*, 2003) in which ‘the order of things’ are defined and contested.

South Africa is one of the most progressive countries in the world when it comes to water policy thinking (Anderson *et al.*, 2008). Since the end of the apartheid period and the transition to democracy in 1994, a review and reformulation of the Constitution was done. The promulgation of a ‘revolutionary’ land and water reform process was expressed in a new Constitution that was drafted with active citizen participation after the democratic elections of 1994, driven by constitutional and political imperatives, and later reinforced through legal frameworks: the Communal Land Rights Act (CLRA) of 1994, the National Water Services Act (NWSA) and the National Water Act (NWA) of 1998. These instruments were based on the core objectives of the National Constitution of 1994, which interestingly coincide with the three ‘Es’ of IWRM: equity, environmental sustainability and economic productivity (Molle, 2008).

Despite the strong emphasis that was placed on correcting the inequities of the past and bridging the gaps among the poor (black Africans) and the rich (most of them white), progressive policy has not been supported by progressive implementation (Van Koppen *et al.*, 2002; Alden and Anseeuw, 2006; Conca, 2006; Merrey *et al.*, 2009). This is why understanding how ICM policies in South Africa have partially changed institutional arrangements but have failed to reorder access and control over land and water resources and its derived livelihood opportunities is of key importance.

In this thesis I will present my analysis of the land and water reform processes in the Little Thukela sub-catchment. My general objective is to understand the role of public policy (through resource and institutional devolutions) in enabling the ‘means’ available for the self-achievement of all South Africans. In order to realize this objective, the study is narrowed geographically using the Little Thukela V13 tertiary catchment in the Thukela River Basin, Province of KwaZulu-Natal (see figure 2) where the Amaswazi and Potshini communities are located and surrounded by established commercial farmers. The ‘public policy’ analyzed is

this research focused on land and water reforms, more specifically on land transfers and the establishment of water user associations (WUAs). Finally the ‘means’ studied refer to resources, specifically land and water.

In the following pages the thesis will be presented. First, an introductory chapter opens with background information to contextualize the problem statement. In this section, research objectives and research questions are detailed, as well as concepts and theories followed by the methodology used for the study. In chapter 2, physical, social and historical information of the catchment is given. The commercial farmers and Irrigation Boards (IBs) as well as the two communities studied are also described. Chapter 3 goes in depth to analyze the commercial farmers and their resources: the former IBs, the water systems and infrastructure they manage and the strategies they undertake to control water and land resources. This is followed by the analysis of two different case studies of land transfer in Chapter 4. Land transfer processes, institutional difficulties and problems encountered for the management of the new land (and water) for the two communal cases of Potshini and Amaswazi is analysed. In chapter 5, the establishment process of the WUA in the catchment, the different actor’s perspectives of the WUA and the link between land reform processes in the catchment with the delay of the water and institutional reform is discussed. Finally, conclusions and perspectives for reform in the catchment are presented in chapter 6.

1.2. Background Information

1.2.1. A hectic history of resource management

To be able to understand the state of poverty and inequality in contemporary South Africa it is necessary to view it within a historical perspective (Mamdani, 1996; Levin *et al.*, 1997). Based on this argument, this section contextualizes the historic processes that shaped the distribution of resources and wealth along race lines, the consequences of which were seen during the fieldwork in 2010, which will be discussed in the chapters of this thesis.

South Africa is located at the extreme south of the African continent enjoying access to both the Atlantic and Indian Oceans (see annex 1). It is believed that by the XVII century different groups of Bantu people (Nguni and Sothotswana most notably) already occupied almost all the South African territory with the exception of the southwest where colonization started and that was inhabited by Khoisan hunters and Khoikhoi people (Marks and Gray, 1975). Though, the Portuguese were the first to reach South African land, it was not until the Dutch East Indian Company settled in the “Cape of Good Hope” in 1652 that white settlement began (Thompson, 1990). In the subsequent decades, different European migrations (Germans, French and Dutch) took place and collectively they formed the Afrikaner segment. The Afrikaners who were not fully supported by a crown or European government eventually confronted and lost against the British who shared strong colonial ambitions.

Thus, it is observed that initially the main battle was between Europeans, despite multiple localised battles against African groups. It is after the declaration of the Union of South Africa (between English and Afrikaner colonies) in 1910 that British and Afrikaner segments -now the white South Africans- shifted their focus to the full exploitation of South Africa’s resources. In order to do so, the question of ‘how to handle the natives’ had to be settled.

Two ruling approaches were introduced, *direct* and *indirect rule*. According to anthropologist Mahmood Mamdani (1996), the main features of both are best illustrated by the South African experience. *Direct rule* was about the exclusion of black Africans from ‘civil’

freedoms guaranteed only to ‘citizens’ in ‘civil society’. It basically developed in the form of urban civil power in the eighteenth and early nineteenth centuries. In South Africa, it was enforced in the so-called white Republic of South Africa, where black Africans were not allowed. By contrast, *indirect rule* was implemented in the so-called “black African territories” named homelands or Bantustans (see annex 2). It meant the incorporation of indigenous black Africans into a state-enforced customary order organised and divided along ethnicity or tribalism and ruled by a tribal authority (TA). The objective was to establish self-governing homelands to force the majority of the black population out of the South African nation and therefore lose their ‘citizens’ rights (Mamdani, 1996; Butler, 2004).

While the process of alienating indigenous black Africans from their land officially started with the *Natives Land Act* of 1913, this began well before the enactment of the act. The *Natives Trust and Land Act* (1936) followed. In 1948, the National Party (NP) with its apartheid ideology won the general election. Apartheid, a system of legalized racial segregation enforced by the white-dominated national government of South Africa between 1948 and 1994. The new government segregated education, medical care, and other public services among different racial groups, and provided black people with inferior services. The educational system was designed to prepare the mass of the black population as labour. The *Bantu Authorities Act* (1951) provided the legal instrument to establish traditional governance structures (accountable to the white South African government) by appointing local tribal leaders to administer the Bantu areas. In addition, with the *Water Act* (1956), access to water could only be obtained through riparian rights¹ that accrued to land ownership or through the intervention of the racially discriminatory state. Finally, the *Promotion of Bantu Self-government Act* (1959) provided the legal framework for separating black spaces from white spaces across the whole nation (Mamdani, 1996; Conca, 2006; McCusker and Ramudzuli, 2007).

As a result, the majority of the population (black South Africans) was increasingly confined to small areas in the Bantustans, having little agriculture potential or access to water. In 1956, the Tomlinson Commission declared all Bantu areas *Betterment Areas*. This meant the re-organisation of existing land use of Bantustans to create Bantu towns and organise land distribution so that each household received a small plot of land in a planned settlement to build a house, plus 1.7-4.2 ha of land for agricultural production and communal areas for pastures. Nevertheless, land was defined as a customary and communal possession and no individual rights to plots were granted. The real reason behind this spatial engineering was to facilitate increasing population (read: labour force) densities (McCusker and Ramudzuli, 2007). As a result, land tenancy was restricted, the black peasantry eliminated and destined to provide cheap labour for the commercial farming, industry and mining sectors (Mamdani, 1996).

With the inclusion of black Africans into the South African nation at the beginning of the 1990s, racially based acts were abolished and comprehensive land and water reform programs were developed to address the injustices of the colonial and apartheid period. Nevertheless, for democratization to be true and real it needed first the deracialisation of civil power and second, the detribalisation of customary power (Mamdani, 1996). While a lot of emphasis and attention was put on the first objective, the administrative power of the chiefs

¹ Under the riparian principle, the landowners whose properties are adjacent to a body of water have the right to make reasonable use of it. Allocation of water based on the riparian principle makes land ownership important for accessing water. It can be argued that the system of riparian water rights as put forward in the Act resulted in commercial white land-owning farmers having secure access to water.

and their headmen has continued until today. Whilst other local and regional state authorities have assumed some responsibilities and power, recent studies confirmed that chiefs still exercise their historical authority to decide over matters such as land allocation (McCusker and Ramudzuli, 2007). As a result, much of the ‘reform’ changes being developed have either enhanced traditional authorities that in apartheid times were part of the policy of *institutional segregation*² and thus had personal and financial interests in the preservation of the apartheid system, or created multiple, contradictory and conflictive institutions.

With the objective to enable solutions to redress spatial, structural and institutional segregation that caused extreme inequality in land and water distribution, new legal frameworks and programs were created. For land reform, three majors programs recognised by the Constitution have been implemented: *Land Restitution*, *Land Re-distribution* and the *Reform of Land Tenure* through the *Communal Land Rights Act (CLRA)* of 1998 (Department of Land Affairs, 1997). For water reform, the *National Water Services Act (NWSA)* aimed at the definition of provision, extension and management of water services and sanitation, whilst the *National Water Act (NWA)* defined water resource management.

The Communal Land Rights Act (CLRA) establishes the transfer of communal land from the State to a community. This entails the devolution of decision-making and the transfer of titles of communal land from the state to a rural community. Under CLRA, tribal authorities (TA) act as ‘land administration committees’ and make decision on behalf of the communities they represent (Cousins, 2007). Although the South African government has created laws to support policies for land reallocation, processes of reforming traditional land use systems in the former homeland areas with post-apartheid strategies for land reform, decentralising policies have been slow, confusing and fraught with delays (Cocks *et al.* 2002; Alden and Anseeuw, 2006; Cousins, 2007).

South Africa’s NWA (1998) states three fundamental water resource management goals: 1) Equitable access to water, meaning equity of access to water services, to the use of water resources and to the benefits from the use of water resources, 2) achieving sustainable use of water, trying to balance between water availability and water requirements to ensure future generations needs, and 3) achieving efficient water use for optimum social and economic benefits. These competing core objectives are in line with the dominant discourse of IWRM, which assumes that through ‘cooperation’ rather than ‘competition’ they can be achieved simultaneously and in parallel (Molle, 2008).

The NWA defined the creation of new water management organs at regional and local level. “At catchment level, the *catchment management agencies (CMA)* will be established in order to achieve the management of water resources in an integrated way” (NWA, 1998: section 80). Amongst other things, CMAs are responsible for issuing and modifying water licenses (DWAf, 1999). In addition, “*water user associations (WUA)* will operate waterworks under its responsibility and monitor the allocation of water among its members” (NWA, 1998: section 98). According to law, the objective of creating WUAs and CMAs was to integrate

2 Institutional segregation referred to a policy of ‘native control’ that was mediated through traditional chiefs working through traditional institutions. Chiefs, often referred as the ‘black tyrants’, often concentrated a lot of functions in themselves: they were petty legislators, administrators, judges and policemen all in one. They also received salaries and different benefits that ensured the influence of the apartheid regime and control resistance over homelands (Mamdani, 1996).

historically disadvantage individuals (HDI)³ to ‘democratize’ institutions and enable wider local ‘participation’.

Two different situations have been encountered for the WUAs. First, smallholder WUAs were supposed to be created in former homelands to transfer management to the users. Second, the bulk of the WUAs is supposed to come from the transformation of former (white) *irrigation boards* (IB) to large-scale WUAs. Theoretically, large-scale WUAs and CMAs have to include HDI, but that has not been the case (Faysse, 2004; Van Koppen *et al.*, 2002). HDIs are not as well organised as the large public and private water users who can defend their interests actively. In consequence, there has been a delay in the establishment of both CMAs and large-scale WUAs, mainly due to the long-term challenges of achieving a meaningful participation of HDI (Karar, 2003). Thus, white commercial farmers have till now dominated WUAs undermining well-intentioned initiatives that instead have reproduced the original socioeconomic and political differences from the past. As Merrey *et al.*, (2009) highlight, initiatives have to date not met redress expectations.

1.3. Problem Statement

River basin organisations (or catchment management agencies (CMAs) as denominated in South Africa) have been widely promoted by the Integrated Water Resource Management model. South Africa has not been an exception and it even based -to a large extent- its new Water Law (1998) on this model (de Lange, 2004). One of the key ‘transformations’ of the water reform is the creation of WUAs and CMAs that are supposed to include all water users and former HDIs.

Although it has been argued that the objective of creating WUAs and CMAs was to ‘democratize’ institutions and enable wider local ‘participation’ to bridge the gaps in society and empower HDIs (NWA, 1998: section 80; DWAF, 1997), studies have shown that WUAs have rather constituted arenas where powerful groups legitimize their water rights (Faysse, 2004a; Faysse, 2004b; Seshoka *et al.*, 2004). More important is the fact that WUAs (and CMAs) are water management institutions that are not properly equipped or mandated to tackle structural redistributions of water rights (Waalewijn *et al.*, 2005). In turn, land reform is a separate process from the water reform. Experts (Merrey *et al.*, 2009) have criticized this division and argued that one of the causes of the ineffectiveness of the water reform is precisely because of this divorce. In the Amaswazi and Potshini community, HDIs are not organized and the institutional setting is complex (Kemerink *et al.*, 2009; Kwezi, 2010). This aggravates efforts to re-distribute or re-allocate land and water resources.

Previous studies (Kemerink *et al.*, 2009; Kwezi, 2010) in the chosen research area have focused on stakeholder analysis and the struggles and strategies of former homeland inhabitants and the commercial farmer directly bordering homeland areas. However, social interactions around newly established institutions to manage land and water resources in communal areas as well as the process of establishment of the WUA in Little Thukela catchment have not been studied. Moreover, the practices, perceptions and strategies of other commercial farmers and IBs have also not been documented. Thus, the main focus of this

³ “HDI means a South African citizen, who (i) due to the apartheid policy that had been in place, had no franchise in national election prior to the introduction of the Constitution of the Republic of South Africa, 1983 (Act 110 of 1983) or the Constitution of the Republic of South Africa, 1993 (Act No 200 of 1993) (the interim Constitution); and/or (ii) is a female; and/or (iii) has a disability, provided that a person who obtained South African citizenship on or after the coming to effect of the interim Constitution, is not to be an HDI” (Free State Provincial Government, 2002).

thesis is: to understand how powerful water users (commercial farmers and IBs), HDIs and smallholder farmers are responding to land and water reform to contribute to an analysis on a broader scale of how negotiations for reallocation of resources could take place.

Therefore, the research problem that this thesis will address is:

The aim of the establishment of WUAs is the decentralized management of water resources by democratic institutions. As such, two issues can be identified: On one hand, the integration and participation of HDIs in WUAs poses many questions over the challenges, difficulties and the real outcomes of this participation to achieve land and water reallocation. This participation is undermined by the organising practices of commercial farmers that seek to secure access and control of water resources under the reform processes. Yet, little is known about commercial farmers' practices. On the other hand, it is crucial to review if the institutional framework is equipped and prepared to redress inequities of the past to give way to new and inclusive decision making processes that will address and ease uncertainties around the reform process as well as allow access to water for HDIs.

1.4. Research Objectives

The overall objective of this thesis is to identify challenges and difficulties of the democratization process in the creation of inclusive democratic water institutions (WUAs) for the decentralised and equitable management of water in the Little Thukela sub-catchment, as well as in the institutional framework in place for the implementation of land and water reform. The thesis sets out to:

- Understand historically powerful users' organising practices to control and or maintain land and water resources.
- Understand how through the different institutions present in the Little Thukela sub-catchment, reform is addressed, managed, circumvented, and/or delayed.

1.5. Research Questions

How have water institutions concerning resource management and decision-making power evolved over time, and how have they changed and been rearranged in response to land and water reform policies implemented in the Little Thukela River catchment, in South Africa?

- What are the organising practices and strategies that historically powerful water users in the Little Thukela Catchment mobilise and use to control and/or maintain land and water resources?
- How are land and water reform policies interpreted, addressed and implemented by different institutions in the Little Thukela sub-catchment?

1.6. Conceptual Framework

As an alternative to analysing WUAs from an institutional perspective, taking for granted the neo-liberal discourse and formal organisational models, this thesis focuses on the organising practices of water users in the allocation of land and water resources. As a result, the analytical framework of this thesis is built on the work of Long (1989) and Mollinga (2003). The conceptual framework is further enriched with concepts from actor-network theory, agency and pluralistic institutional settings.

The conceptual framework starts with a discussion of the analysis of institutional arrangements in line with the new institutional economics by Ostrom (1990) and (Vermillion, 1994; Vermillion and Sagardoy, 1999; Meinzen-Dick *et al.*, 2002) in section (1.6.1). After highlighting the shortcomings of these perspectives for institutional analysis, the conceptual framework used in this thesis will be introduced. First, the actor-oriented perspective (Long, 1989) will be explained and the choice for the sociotechnical approach to water management will be introduced in section (1.6.2). This will be complemented with a discussion of power and agency and concepts drawn from actor-network theory. Finally, in section (1.6.3) theories of legal pluralism will be discussed as a means to understand the complicated institutional setting in the former homelands.

1.6.1. Rational actors and Institutions

The work on water management institutions design and development has generally followed two approaches. Ostrom (1990) emphasizes *governance* in which rules of management practice are generated. Another group has been more focused in identifying *conditions* under which water management institutions could perform irrigation management tasks (Vermillion, 1994; Vermillion and Sagardoy, 1999; Meinzen-Dick *et al.*, 2002).

Ostrom (1990) builds her work on the *rational choice theory* whose logic describes institutions as arrangements of rules and incentives, and members of the institution as rational actors whose behaviour depends on the views and weights of “the benefits and costs of actions and their perceived linkage to outcomes that also involve a mixture of benefits and costs” (Ostrom, 1990: 33). According to this theoretical notion, actors may participate only for as long as they find it profitable (when the rewards received exceed the costs incurred in the process of participating). This institutional analysis focuses on exploring the adequacy of the rules and incentives and tries to model how changing rules and incentives shape human behaviour.

The other group has focused on organisational type, size of organisation, compatibility of structures and clear water rights. Like Ostrom (1990), both groups main concern is focus on finding appropriate conditions and generating ‘the’ rules that may allow the management and governance of irrigation water.

The problem of these analyses is that they are based on the belief that only through individual rational decision-making and maximization behaviour, organisational practices and institutions performance can be explained. “People are narrowed down to individually calculating economic humans, rather than being social and cultural community members affiliated through ties of kinship, ethnicity and neighbourhood, who apart from economic behaviour also listen to ‘irrational’ motives” (Boelens, 2008:142). This perspective fails to consider that actors’ perceptions and strategies are shaped in social processes and negotiations (Long, 1989). As a result, governance is possible under variable forms of regulation and *sociotechnical* control.

In the battlefields of schools of thought, this thesis chooses to build its framework on the work of some scholars⁴ that seek to build frameworks that do consider social and power relations, and that situates humans and their practices at the core of the analysis, in contrast to

⁴ See the work of Long (1989), Vincent (1997), Cleaver (1999, 2002), Mollinga (2003), Rap (2004), Zwarteveen (2006), Wester (2008), Molle (2008), Mosse (2008), Boelens (2009).

approaches that position human beings as instruments for achieving objectives with underlying discourses and global interests.

1.6.2. Resources and Power

The focus of this research is on land and water resources because of the unquestionable principle that access to and use of land and water-dependent resources mediates livelihood strategies. In this research, *resources* refer to the material per se, land and water, and the fundamental materials that serve as means to concretize land and water rights such as technological artefacts and infrastructure (e.g. dams), labour and financial resources, etc (Mollinga, 2003). Understanding how these resources enable and/or facilitate people's livelihoods and power will allow a better understanding of how to reduce rural poverty (Hope *et al.*, 2004).

In order to use resources such as land and water for farming, actors have to mobilize and reproduce their resources to convert them into specific values. Mobilisation of resources implies relations between actors and institutions external to the farm (Van der Ploeg, 1994) (e.g. buying inputs such as fertilisers, rent/lease of land, selling harvest, manage canal irrigation, distribute water for irrigation, etc.). In an agrarian reform context, directly and/or indirectly different actors are brought together (e.g. land and water reform beneficiaries, former land and water owners, other farmers, extension and State workers, etc.) and interact (communicate, negotiate, take decisions, struggle, etc.). These (social) actors' interactions may result -according to Long (2001)- in sets of interests and complex practices which ultimately result into interlocking projects. Within these interlocking projects various relationships, interactions and activities between individuals or groups give rise to newly created social spaces or domains of interaction.

Villarreal (1994: 59) defined domains of interaction as "areas of social life wherein practices are routinely organised within specific locales and where certain authorities, values and identities are recognized, reproduced and transformed". As observed by Long (2001, 2004), values and meanings are interpreted in different ways by different social actors which try to create room for manoeuvre for their own objectives through social interactions.

The *actor-oriented* approach takes as its point of departure actors' perceptions, practices and strategies and analyzes how these are connected to actors' livelihood strategies (Long, 1989). As such, this approach helps define 'reality' according to how humans deal with everyday interactions on the ground. It perceives actors as social beings whose perceptions and actions are shaped in social processes and negotiations.

Contrary to land for farming, "irrigation water is not a resource that can be collected by water users at central distribution points, like people can buy stamps in post offices...and fertilisers at fertiliser outlets" (Mollinga, 2003: 30). The nature of water along the time-space⁵ characteristics of irrigation makes the mobilisation of the resource a challenge. In addition,

⁵ Mollinga (2003) explains the time-space dimensions of irrigation. Spatial dimensions of irrigation are contingent of crop production. This means, that soil-water interactions (physical processes) have to be taken into account as irrigation systems are meant for spreading water geographically. Different soil qualities, weather variations, as well as different crops (with different water requirements) in different parts of an irrigation system complicates water supply. In turn, the time dimension of irrigation relates to 'rhythms of the climate and weather' and the growing cycle of crops. Rainfall patterns and temperature may influence the discharge of the river from which an irrigation system may take its water. While, the growth cycle of crops influence irrigation demand because crops have different water requirements in different parts of the production cycle.

people that conduct the irrigation activity (water users) adapt to the spatial and time dimensions of irrigation, but also strategically use and contest water systems (Mollinga, 2003; Mosse, 2008). Thus, irrigation requires specific technologies and infrastructure, as well as institutions to deal with water delivery (supply, demand) distribution and even conflicts.

The *sociotechnical* approach to water management states that irrigation management is not only practiced by human actors, but humans mobilise their resources such as technological artefacts and infrastructure to manage and control water resources (Mollinga, 2003). The approach was developed to study water technologies as an intermediate between society and natural resources (Bolding *et al.*, 2000). Technology has social requirements for use, is socially constructed and generates social effects (Mollinga, 2003). In consequence, technology is not neutral, but contains a certain code that reflects power relations in society (Van der Ploeg, 1992). This implies that to understand irrigation and water management both the social and technical dimensions have to be address simultaneously. As a result, the sociotechnical approach is inevitably an interdisciplinary approach.

Originally, the sociotechnical approach was used to analyze irrigation artefacts (Arifakto, 1990) and then it moved more broadly on irrigation water management practices linking forms of organisation, the agrarian structure and the State (Mollinga, 2003). Wester (2008) further developed the sociotechnical approach while applying it to the study of governance and water reforms. This thesis recognizes the sociotechnical approach and therefore, it adopts this interdisciplinary approach for research.

The central concept in the sociotechnical approach is *water control* (Mollinga, 2003). This is the central concept of this thesis from which other concepts such as organising practices (defined below) derives. This concept has been chosen, as commercial farmers use an incredible amount of infrastructure (dams, pumps, irrigation systems such as pivot central, etc.) compared to the limited infrastructure available to communities in the research area. As it is confirmed in this thesis, infrastructure is not just used to irrigate crops but also to protect and maintain commercial farmer's 'rights'. Besides this recognition, this research takes infrastructure, technology and access to institutions (e.g. canals, dams, irrigations systems, relations with IBs, etc.) in the field as evidence (or expression) of the power relations in the study area. Recognizing this is important because it helps identify control and allocation of resources, but also understand why processes follow certain directions and not others.

Mollinga (2003) distinguishes three dimensions of water control: Technical (e.g. controlling the water flow), managerial-organisational (e.g. control of human behaviour or the creation of 'bias', see further below), and socio-economic and political control (e.g. control of social processes). He also states that each of them describes different features of the same object (water control), but a change in one dimension leads to changes in the other two dimensions. Finally, he acknowledges that power is found in the context of irrigation practices and thus concludes that the concept of power binds the three dimensions together (Mollinga 2003), since it determines the transformative capacity of an individual (e.g. irrigator or commercial farmer) to manage these three dimensions in his/her favour to achieve certain outcomes⁶.

Resources are directly related to power because they are structured properties of social systems and the *media* through which power is exercised (Giddens, 1984). From a political economy view, *power* is the result of an accumulation process and the struggles shaped by

⁶ Adapted from the concept of power of Giddens (1976:110) in Mollinga (2003:39).

this. For Foucault, power is not a thing but a relation, it is not simply a property of the State, but a property of society or the social community exercised at micro levels of social relations (Foucault, 1980). Power within social systems enjoys some continuity over time and space. It presumes regularized relations of autonomy and dependence between actors or collectivities in contexts of social interaction (Giddens, 1984).

Bachrach and Baratz (1962) introduced the idea that power has two faces: the first is the capability of actors to take concrete decisions which they favour (e.g. participation in decision-making) and the second, is the mobilization of ‘bias’ that is built into institutions (e.g. the extent a person or a group reinforces certain ideas or decisions over others). The capacity actors have to exercise the ‘two faces’ of power is directly dependent of their agency capacity. That is why it seems compulsory to understand the nature of power in order to understand the nature of struggle and agency (Mamdani, 1996). *Agency* “refers not to the intentions people have in doing things but to their capacity of doing those things in the first place” (Giddens, 1984:9). This is why agency implies power.

In summary, “irrigation practices are inherently political processes” because management institutions and technology reflect social relations of power, and likewise, socio-economic and political power in irrigation reflect forms of organisations and technology (Mollinga, 2003:40). Similarly, Mosse (2008) pointed out that water management practices are not only shaped by, but also shape socio-political relations and are often the result of history. Thus, “water may be a mirror into which rural society gazes or through which power operates, but is rarely a medium of rigid social structures” (Mosse, 2008: 944) Therefore, water resource control is analyzed as a politically contested process (Mollinga, 2003), in which debates, conflicts, cooperation and decision-reasoning⁷ regarding the use and allocation of resources by different actors are encountered.

One of the objectives of this thesis is to understand the organising practices that different actors used to control land and water resources within the establishment of new water management institutions. *Organising practices* are defined “as the sets of socio-technical practices that organise the access to and control over resources such as (land and) water, maintenance machinery, administrative means and other political and economic resources involved in irrigation management” (Rap, 2004:10). He also proposed the analysis of organising practices through two dimensions of control, *socio-technical control* and *economic and politico-institutional control*.

The first dimension builds on the sociotechnical approach described above. It analyse social interaction as the analysis of strategic conduct, focussing on strategies of control within defined contextual boundaries (Giddens, 1984). It aims to analyze how different set of actors mobilise, manage and control sociotechnical networks to control resources. The second dimension views practices, projects, strategies and alliances as means to establish economic and politico-institutional control over resources. It builds on the work of Long and van der Ploeg (1995) who view actors’ projects as a reflection of specific interests who mobilise resources for achieving certain goals and determine the social order (Rap, 2004). These concepts are particularly important in the analysis presented in chapter 3 of this thesis, which is especially devoted to the analysis of strategic action.

⁷ I mean by this the meetings or simple discussions where actors *reason* about decisions. Usually a lot of attention is put on decision-making because it implies that whoever is involved in this process has decision-making power. Yet, I think that reasoning processes are also very important because they may shape or even determine decision-making outcomes.

The actor-oriented and socio-technical approach are complemented with *ANT*, the abbreviation of the *Actor Network Theory* (Latour, 1996) which analyses the processes of socio-technical ordering by tracing the associations through which heterogeneous actor-networks are established.

ANT states that all actors, these being humans or technological artefacts can be interconnected without limit. What may on the one hand seem closely related, could actually be not related at all if there is no connection, or relation, between them (Latour, 1996). As the subject-object relationship, where the object can also have an influence on the subject (Sayer, 1992), technological artefacts could have an influence on humans and therefore they can be described as an agency. In this way a hint of the actor network theory is added and a system is not only seen as a two-dimensional scheme with black boxes that need to be explained, but it is also seen as nodes that have as many dimensions as connections (Latour, 1996). In this system of ‘nodes’, or networks, only the connections and linkages need to be explained and made visible, according to the actor network theory.

1.6.3. Legal pluralism, institutional pluralism: community bottlenecks?

The conceptual framework also builds on the theories of legal pluralism. *Local law* is the concept that describes the outcome of *legal pluralism*. Legal pluralism is the phenomenon where laws from different sources, scales or designed purposes are used in a local setting to become apparent when justifying certain claims (Benda-Beckmann *et al.*, 1998). I refer by *law* here not as the code written laws in national Constitutions or local associations, but to “all those objectified cognitive and normative conceptions for which validity for a certain social formation is authoritatively asserted” (Benda-Beckman *et al.*, 2006: 12). These laws can be national, religious, regional, ancient, or market, for example.

Although they are not the same, or they do not fully encompass each other, *customary law* influences local law. Customary law can have different meanings, or describe two different things (Benda-Beckmann *et al.*, 1998). The first is customary law as a description of the distinctive nature of local rules and rights. These customary laws are the actual laws practiced, besides (or despite of) official laws, which may or may not be contradicting each other. They are often based on traditions, religious beliefs, culture, or pre-existing/existing laws. These customary laws are not written down, they are handed down by tradition from one generation to another and therefore, they are well established and have the force of law within the community (Denning, 1982⁸). It should be noted however, that customary laws and customary practices are not identical, as there is a difference between what one is required to do by tradition, and what one actually does in reality. The second type of customary law is not a description but an actual law. Within this ‘lawyer’s legal law’ local traditions and customs are incorporated. In a way, local traditions and customs are legalized, or ‘domesticated’ this way (Boelens *et al.*, 2005).

As a result of progressive implementation of state legislation and of the continued application of customary law, several legal systems (normative or official laws, customary, and ‘in-betweens’) regulate resource rights in the same territory, resulting in overlapping and contradictory rule and competing authorities (Griffiths, 1986; Meinzen-Dick and Nkoya, 2005). Nevertheless, Benda-Beckmann *et al.* (2009) highlights that customary law needs to be seen not as ‘informal’ or ‘traditional’ systems separate and opposed to ‘formal systems’ of

⁸ Words of Lord Denning in the *R v Secretary of State for Foreign and Commonwealth Affairs* (1982). Found in <http://www.austlii.edu.au/au/journals/AILR/2001/20.html>, visited the 18th of April, 2010.

law, but as mutually imbricated with the latter or as “competing forms of institutionalisation” (Benjaminsen and Lund, 2003:22).

In some cases very dynamic and newly developed laws might be used, whereas if it is more strategic for specific interests that in another situation ancient, rigid, and/or idealized laws might be used to justify claims and personal interests. Even if laws are contradictory, they will be used when best suited (Meinzen-Dick and Pradhan, 2002). Thus, *legal pluralism* is a concept where one can apply different legal systems to a situation, or (natural) resource (Bavinck, 2005), but that in heterogeneous societies may be beneficial for some actors while disabling for others.

Though ideally each person has multiple legal resources at hand that they can apply in a certain situation, this is narrowed down to the actors that have the agency capacity and thus, power to know and use different legal systems to support their claims and interests. Actors have competing and conflicting interests, different opinions and access to different knowledge and information (Vos, 2002). Therefore, legal pluralism can be used as a tool to look, within the local context, at the different legal orders, interests, social practices and social relations that are present in social interaction (Spiertz, 2002).

In everyday life legal pluralism, or the use of different laws, may not be very apparent, but in conflict or disputes claims will need to be justified. The use of legal rights and principals usually becomes explicit in such a situation (Benda-Beckmann *et al.*, 1998). The benefits or profits for and interest of the users as well as the power they are able to exercise in different settings, will determine which laws will be used in what way.

Legal pluralism is therefore used in this study to understand how different institutions (and actors) around the Little Thukela catchment use ‘the law’ to address resource management issues. For instance, the NWSA (1998) determines that municipalities are in charge of potable water services and sanitation. In turn, according to the NWA (1998) DWAF is in charge of water resource management, which means that allocation of water for agriculture is DWAF business. Yet DWAF cannot ‘allocate’ water if land allocation does not first take place. And even when land has been allocated there can be contradictions between different local laws, particularly customary and ‘State law’. This then entails that DWAF has to mediate through traditional authorities (which have their own customary laws), the Department of Land Reform and Rural Development (DLRRD) for water reallocation, and the social actors that protect or seek to improve their access to water.

In consequence, it seems important to note the layers and the uses of different laws in the local context of the research area, to be able to understand how certain institutions or actors, also use (or choose) different laws to acquire, defend or maintain their power.

1.7. Methodology

The research is designed as a case study. A case study is an empirical enquiry that investigates a contemporary phenomenon within its real-life context, especially when the boundaries between phenomenon and context are not clearly evident (Yin, 2008). The case study method is believed to allow investigators to retain the holistic and meaningful characteristics of real-life events. In this case study, a first focus is on the organising practices of some members of the WUA, the historically powerful water users. Then attention is given to processes of land and water reform that are taking place in the catchment. Finally, the case study finishes with the empirical findings of the establishment of the WUA in the catchment

interlinking the first and second focus of this thesis: organising practices of commercial farmers and the social interactions of different actors and institutions around land and water reform.

The research is an explanatory case study when the questions “why” and “how” are asked. The questions that I wanted to answer basically sought to understand what is going on, on the ground, with the transformation of the ‘little’ WUAs that will be probably the only means of representation of HDI in the forthcoming CMAs.

This thesis mainly analyses qualitative data though technical background in irrigation was used during the fieldwork to understand the function of water systems and the different sociotechnical adaptations actors undertake to change systems.

The study was conducted following an ethnographic approach. Long (2004) expresses the importance of this approach for exploring relations of social interests, cultural interpretations, knowledge and power and how they are mediated and transformed. Participant observation, semi-structured interviews, working with the farmers in their farms to see what are their actual practices and how they manage their infrastructure, plus living in the communities, both in the community of Winterton and the upstream communities of Amaswazi and Potshini were the main activities for data collection. As planned, this interaction helped establish relationships of trust with the actors to follow their activities. This allowed me to talk with people beyond the field or office, and perhaps meet them in other social places (like bars, the Winterton country club, church or just crossing people in the streets, etc.) to get more information and better understand their behaviour and environment.

The *extended method case study* is used, as it takes into account not just the present situation. This method takes into account history and different spatial levels (regional and political levels). “It applies reflexive science to ethnography in order to extract the general from the unique, to move from the micro to the macro and to connect the present to the past in anticipation of the future” (Burawoy, 1998:5). This method was chosen as current organizing practices and more in general, the current status quo of South Africa’s agricultural and irrigation sector, is the result of a recent and racial history shaped by subsequent neo-liberal policies that determines what I, as a researcher was able to ‘see’ in my case-study. In addition, the focus of the study is analyzing every day practices while introducing the authors (or researcher) reflexive thinking of what is studied. In consequence, the extended method case study seemed the most suitable method for this study.

Globally, time for ‘community interaction and integration’ during the fieldwork was divided in two: half of fieldwork time (about 2 months) I was based in Winterton (mainly a white agriculture community), and the other half (about 1 month and a half) in the communities of Amaswazi and then Potshini⁹. However, within these two general groups, (e.g. commercial farmers and emerging farmers communities) actors share differences of power and resources proper of heterogeneous societies. Thus, a balance was sought between interviewers that belonged to these two general groups e.g.: ‘commercial farmers with concrete rights’, ‘commercial farmers without concrete rights’, ‘well-connected emerging farmers’, ‘isolated-less informed emerging farmers’.

⁹ Though this didn’t meant a restriction as I visited different actors outside the formal planning.

The division of time allocation amongst the two main global actors (commercial farmers and communities) also already introduces how the analysis of institutions was developed in this thesis. While in the field, commercial farmer's discourses and questions concentrated around the lack of use of water for irrigation by HDIs' communities. So the question was: 'what is their (referring to HDIs' communities) justification to integrate or form part of the WUA that manages water for irrigation?', 'what is the point if they don't even have land?'. They also directly pointed out at "failed" transfers of land and water properties to HDIs communities in the research area. Thus, it seemed natural to analyze the opportunities, constraints and challenges of the institutional reform that is taking place in the catchment from both sides of the future and yet diverse members of the WUA. As a result, the analysis is divided as twofold. First, land and water reform processes happening have to be studied to understand why these are 'failing' and how they could be improved. On parallel, it is equally important to understand how commercial farmers are reacting, adjusting and shaping these reform processes as well as to understand how HDIs could better participate in arenas where the main objective is the management and 'equitable' distribution of water.

As stated before, the research is dedicated to institutions and the actors that integrate, direct, manage, control or manipulate resource management institutions. In the Thukela River Basin as most of South Africa's management areas, there are present different types of institutions. First we have different *state-transfer-user* institutions: each Water Management Area (WMA) has or should have a Catchment Management Agency (CMA) responsible for the Catchment Management Strategy (CMS), organizing funding of its implementation and modifying water licences. The WUAs are responsible for the operation of the waterworks and to monitor the allocation of water among its members (DWA, 1999). It is clear that at local level WUAs have neither the power nor the legal authorization to 're-allocate' or distribute water licences; this is the responsibility of CMAs and DWA. Yet, the CMA for the Thukela WMA does not exist yet. The term *state-transfer-user* is used because currently DWA (which is a State institution) is under the process of establishing these water management entities in which users have "to bear the brunt of sharing the costs of development" (Simpungwe, 2006) and the State no longer shoulders the financial burdens of operation and management (O&M). Questions regarding the establishment of the future Thukela CMAs as well as the DWA efforts to establish it are not asked in this thesis. Nevertheless, the implications of the establishment of the Little Thukela's catchment WUA in broader forums like the CMAs are discussed in the conclusions (chapter 6). Interviews mainly sought to know about IBs-WUA activities and work done so far, the factors that constraint or enable the licensing process, the integration of historical disadvantage individuals (HDIs), their members perceptions, practices and strategies, etc.

Large-scale user WUAs were in the apartheid period Irrigation Boards (IB) but had to be "transformed" according to the NWA (NWA, 1998: section 98). In the Little Thukela sub-catchment, upstream communities like Potshini and/or Amaswazi and the commercial farmers integrate one WUA. Therefore, apart from studying their businesses of maintaining and controlling their resources, interviews with the organisation and DWA were done about the transformation process from IB to WUAs. It is understandable then, that commercial farmers, chairpersons and other directives of the WUA in the Little Thukela catchment were the focus of this part of the study.

Finally, there are different institutions in the former homeland of Potshini as well as in other communities in the area like Amaswazi. These institutions are related to the acquisition and control of land and water resources. Until present, both communities are not organised in a

WUA and as a result, they have no collective manoeuvre to defend, resist or negotiate their rights. In contrast, traditional authorities have still a lot to say in the allocation of land resources. Research objectives will seek to know about their strategies, negotiations and other relevant activities related to the acquisition of land and water rights. In addition, traditional authorities may constrain redistributive mechanisms that thwarted tendencies to reproduce inequalities in a cumulative fashion (Mamdani, 1996). Therefore, it was interesting to see the role of traditional institutions in the delay of the distribution of rights in the case of Amaswazi community.

This study does not focus on water supply and sanitation organisations as created in the National Water Services Act (NWSA) and whose functions are different from water resource management. Nevertheless, the process of division of tasks between the municipality (who is in charge of water services) and native authorities (who allocates land) will be investigated to understand how decisions, law and customary law are intertwined in the case-study.

As a result, this second part of the study entailed the study and interviewing of traditional authorities, municipality staff, civil society organisations involved in community work, and other local leaders and emerging farmers that are interested and have already initiated struggles for reallocation of rights.

Research enabled an understanding of what different actors are doing to protect or gain land and water rights, and how actors within institutions arenas reacted (responded) and worked with each other, within normative and customary frameworks, different interests, technology and discourses.

Chapter 2. Setting the scene

This chapter seeks to position the reader in the research area. To do so, background information is detailed giving physical information of the catchment in section 2.1 and its history in section 2.2. In the following two sections a description of the rivers and its main users including the established IBs and resources is presented. How commercial farmers in the different rivers use water is also described. Finally, the chapter finishes with the description of the HDIs communities of Potshini and Amaswazi in section 2.5.

2.1. The study area: Little Thukela Catchment

The Thukela River Basin in the province of KwaZulu-Natal is one of South Africa's 19 designated Water Management Areas (WMA), the water resources of which will eventually be managed by its own CMA. The sub catchments of the Thukela WMA are the Upper Thukela, Little Thukela, Bushmans, Sundays, Mooi, Buffalo and Lower Thukela (Schulze *et al.*, 2005a).

The Thukela River has its source in the Drakensberg Mountain in the west. The Thukela then flows eastward from across low mountains, open hills and lowlands, thereafter, through a deeply incised valley until it reaches the Indian Ocean approximately 85 km north of Africa's major port city of Durban (see figure 1) (Schulze *et al.*, 2005a). The Little Thukela consists of the tertiary¹⁰ catchment of the Little Thukela River, a tributary of the Thukela River (see figure 2).

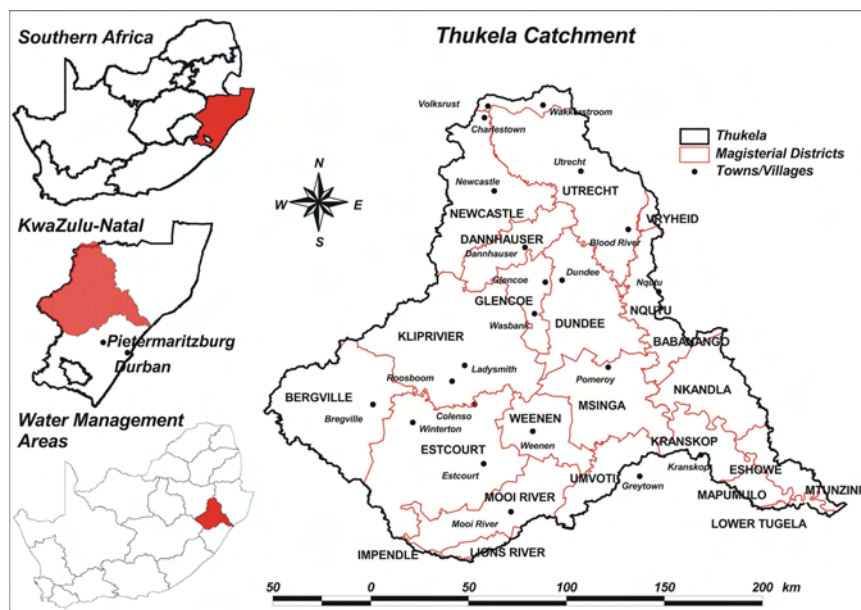


Figure 1. Location of the Thukela catchment in relation to KwaZulu-Natal province, designated Water Management Areas in South Africa, magisterial districts and major towns within the catchment. Source: Schulze *et al.*, (2005a)

¹⁰ South Africa's catchments have been delineated in primary, secondary, tertiary and quaternary catchments. This means that within the area of the tertiary catchment V13 of Little Thukela, there are quaternary catchments of tributaries of the Little Thukela catchment.

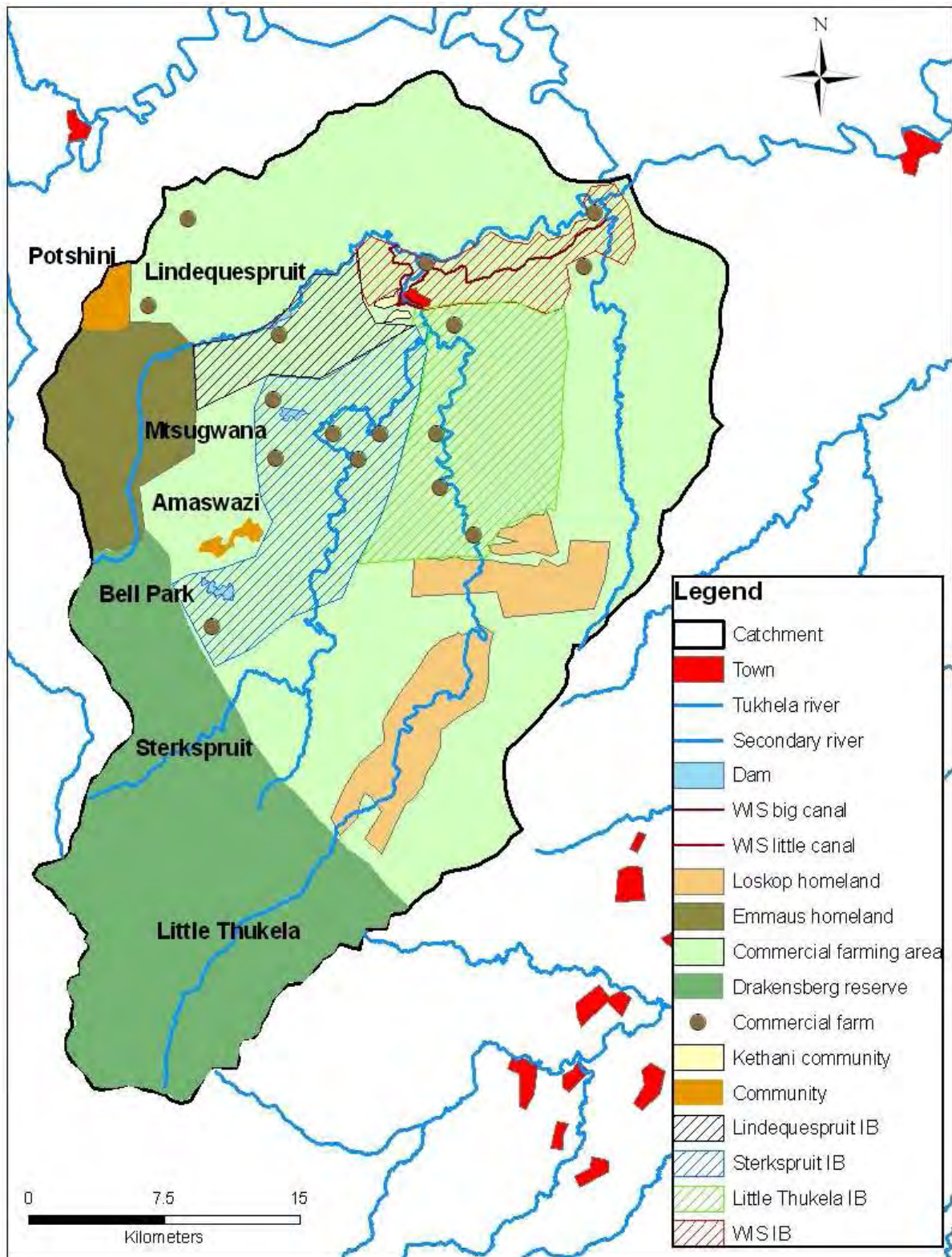


Figure 2. The Little Thukela Catchment with the location of its rivers, main dams, communities, commercial farming area and main towns. Source: own construction.

The research was developed in the Little Thukela catchment located in the Highlands Region at the feet of the Drakensberg Mountains in the province of KwaZulu-Natal, South Africa. The Little Thukela has three main tributaries: The Sterkspruit, the Lindequespruit and the Kaalspruit. Both the Little Thukela and the Sterkspruit rise in the Drakensberg Mountain Range in the Injasuti area near Monks Cowl. The Lindequespruit is born about 10 km north of the Sterkspruit in the area near Cathedral Peak. The Drakensberg Mountains present altitudes exceeding 3000 m. The rivers flow eastward from a steep escarpment across low mountains of high relief, open hills till lowlands of low relief (Schulze *et al.*, 2005b). The Sterkspruit meets with the Little Thukela 3 km before Winterton while the Lindequespruit meets the Little Thukela about 3 km after Winterton. The Little Thukela has its confluence with the Thukela River downstream of the Winterton Irrigation Settlement (WIS) (see figure 2).

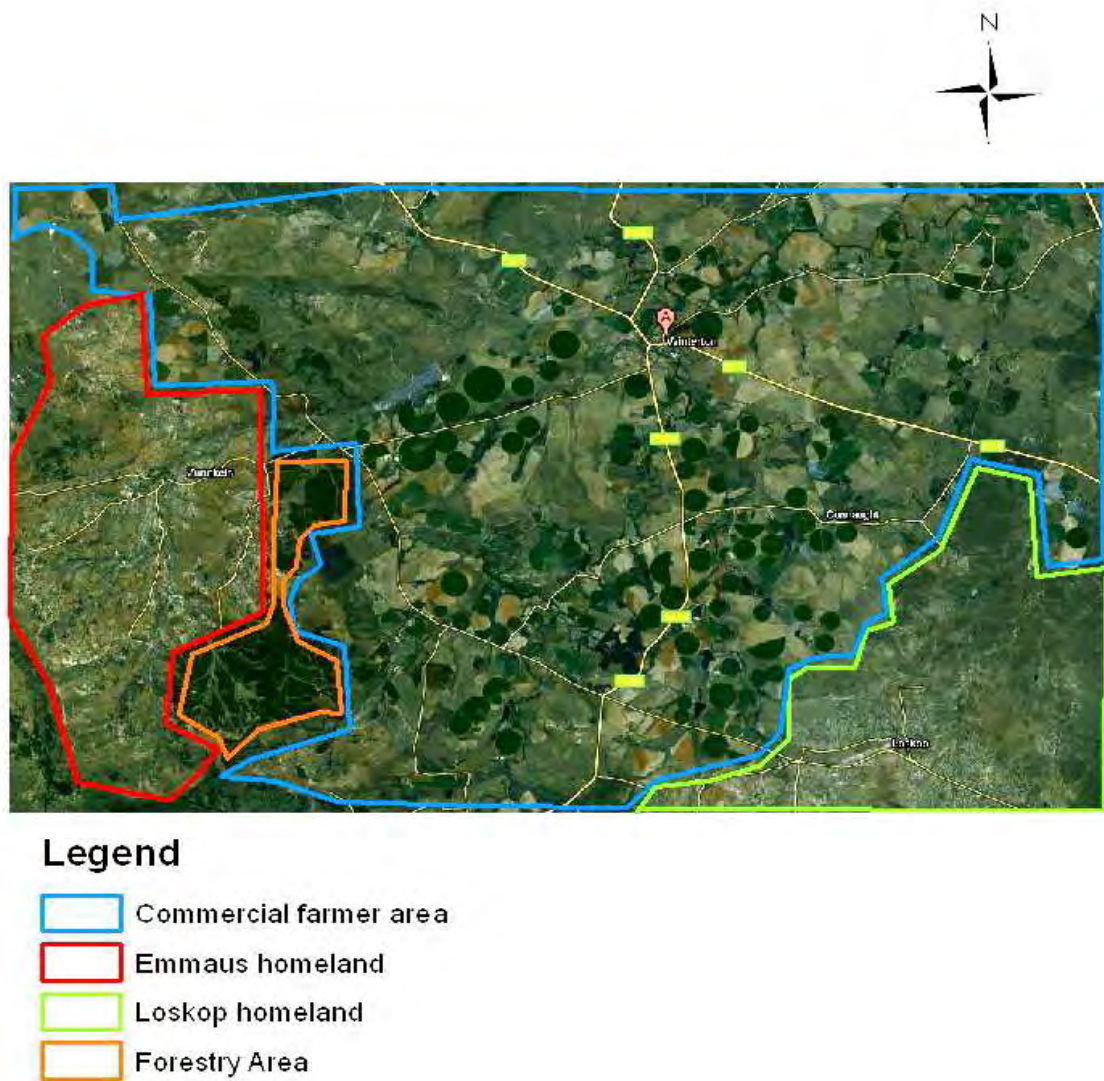


Figure 3. Land use in the Little Thukela Catchment. Source: Google Maps 2010.

According to the Land Type Survey (1986 found in Schulze *et al.*, (2005)), red-yellow apedal and freely drained soils are predominantly of the Highlands Region. The area is predominantly basic and through long usage, the soils of the area have been proved suitable for agriculture.

Land tenure differs between upstream communal areas and the commercial agricultural lands downstream with the exception of the new farms acquired by the community of Amaswazi, which are under communal tenure. Commercial farmers hold title deeds for their privately owned properties. On the contrary, upstream areas are State owned land under the custodianship of Tribal Authorities (TA). Amaswazi land restitution case has a complex mix of land tenure in which the first farm acquired for settlement purposes (and small-scale agriculture) is in jurisdiction of the TA and the second, destined to the development of commercial agriculture under the community jurisdiction (Smahla Land Trust Constitution, 2009). Liebrand (2007:18) who found similar land tenure patterns in the veld area in the Transvaal, rightly points out that “the land tenure pattern reflects more than matters of ownership and jurisdiction, it also reflects the socioeconomic situation of the area.”

Rainfall varies from upstream in the Drakensberg Mountains to the area around Winterton, where the lower values are found (see tables 1, 2 and 3 in annex 3). In the mountains, high values to 1000 mm per year have been recorded, while the average for upstream communities lies around 800 mm per year. In the area around Winterton the average annual rainfall varies from 640 to 870 mm. Annual (A. pan) evaporation is 1728 mm.

Despite Little Thukela’s relatively narrow geographical range of latitude and longitude (see figure 2), the range of annual *net* irrigation requirements (i.e. without accounting for conveyance and in-field water losses) is between 500 and 1 200 mm per annum (Schulze *et al.*, 2005b). Irrigation of wheat, soybeans and maize by commercial farmers is a major water user throughout the year. According to Schulze *et al.* (2005b) in the Thukela catchment, the locations of high and low demand depend primarily on rainfall distribution and atmospheric demand within the Thukela catchment. Hence the high demand around Winterton, with its relatively high temperatures, extreme rainfall distribution and large irrigation requirements.

Due to limited water resources in the catchment and large irrigation requirements, this area is considered to be stressed, with water requirements far in excess of the sustainable yield (Institute of Natural Resources, 2007; DWAF, 2004). Nevertheless, the Little Thukela River is also a flood prone river with a record of multiple incidents of infrastructural damage (Department of Environmental Affairs, 1987). In addition, it can also be said that there is an unequal distribution of rainfall during the year that limits water resources use especially during the dry season. In certain years the Little Thukela River has been pumped dry by irrigators, and sizeable irrigation dams have been constructed at the instigation of local irrigation boards (IBs) (Schulze *et al.*, 2005b) (e.g. Bell Park Dam and most recently the Lindequespruit and Mtsugwana Dam).

The main crop in the area is maize. Though a wide diversification of agriculture is found amongst commercial farmers who also cultivate wheat, soybean and to some extent other vegetables. Pigs, beef and milk and irrigated fodder crops (sorghum and alfalfa) and pastures are also a strong feature.

In the upstream areas where most emerging farmers are located, dryland agriculture is practiced with some exceptions. The main feature is small-scale agriculture of maize and/or beans in the rainy season (summer). Some farmers also have small plantations of marihuana (Kemerink *et al.* 2009). Home gardens are also planted particularly during the rainy season. Yet, in some communities like Potshini where external aid from different NGOs is strong, home gardens can also be found during the dry season. It has to be noted that home gardens are irrigated with the same water women and children fetch for their domestic use. This has

been known as Multiple Use Systems (MUS) (Maluleke *et al.*, 2005). No irrigation systems are installed in these communities.



Picture 1. The ditch that separates the community of Potshini and the lands of the commercial land downstream of the community can be seen in the picture. Two different agricultural systems along colour-race lines characterized the two sides of neighbourly land. Source: picture taken by colleague Simon Besnard.

The objective of production between both agricultural systems is completely different. Commercial farmers crop wide areas that vary from 30 ha to 1500 ha. They sell their productions to transnational companies, private companies and cooperatives. Emerging farmers upstream crop small areas that vary from 0.5 to 4 ha. The main purpose is for home consumption, though surpluses are sold usually to neighbours in the same community.

Winterton and Bergville are the main towns in the area. Both are predominantly English speaking communities common to KwaZulu-Natal province. Winterton is the main centre visited by commercial farmers from the research area. AFGRI (the private company that gave a loan to commercial farmers to construct the Mtsugwana dam) is located in this town. Other agricultural shops, gas stations and the Winterton Country Club visited by commercial farmers are also located here. Four churches, one restaurant and one coffee shop as well as some shops fill in the only main street of Winterton. White people mainly inhabit the town though just outside the village there is a big settlement named Kethani where approximately 10,000 black people live (pers. comm. President of the Isibani Winterton community centre). Bergville on the other side is a bigger town and its more visited by black people. With its popular shops, market and taxi rank, most of the emerging farmers rather go to Bergville in search for agricultural inputs. A regional office of the Department of Agriculture (DA) is also located in Bergville. For all these characteristics, it is a very busy town during the day in comparison to the calm Winterton streets.

Connection is very good with the N3 (national highway) just 15 km from Winterton. The Estcourt – Bergville road cuts the catchment (research area) almost in half, allowing public

transport and normal vehicles to transit the area. In addition, there are many dirt roads to and from this and other main roads.

2.2. History

In South Africa, Bantu culture was formed by four major groups: the Nguni and the Sothotswana, the most relevant and big groups, and the Venda and Tsonga that constituted small groups (Wilson, 1969). Before the XV century these groups already constituted homogenous cultural entities and differentiated amongst them. By the mid XVII each of them was concentrated in specific regions but it was common the coexistence and community absorption by other communities (Marks and Gray, 1975).

The *Nguni* were most predominant in the regions from the Drakensberg Mountains to the Indian Ocean. The ethnic groups of the Xhosa (in the Cape area), the Zulu (predominantly in Natal), the Swazi, also known as the Siswati or Si-swait, the Ndebele of Transvaal and various small ethnic groups of the northeast and southeast Cape and Natal (Hlubi, Mpondo and Qwabe, amongst others) constituted the Nguni speaking people (Wilson, 1969).

The Zulu tribe have settled in the area in the 16th century. The emergence of the Zulu military State, and specially the figure of the king Shaka is generally considered as the decisive turning point in Zulu history. Before Shaka's reign (1787-1828), the Zulu consisted of numerous clans that were related but disorganised. Under his leadership, the Zulu conquered most of the territory between the Drakensburg Mountains and the Indian Ocean (the current KwaZulu-Natal) and the conquered tribes were incorporated into the Zulu kingdom. However, many migrations resulted from invasions and general aggression (Wright, 1971). The Zulus also fought several wars against the British and the Afrikaner, but finally surrendered in 1880. From then on disempowerment and subordination of the Zulus as well as other black African tribes was enhanced (Omer-Cooper, 1978, 1994).

In this thesis it is assumed that black Africans were alienated from their land by white (either Dutch or English) descendants. Though commercial farmers discourses seek to imply that they were in the area since 1872 (pers. comm. commercial farmers), it is reasonable to believe that the Zulu or Nguni people lived in this area long before the discovery of South African lands. This is important to clarify, as the question of 'who was first in the South African soil' is legitimate for the study of the land restitution cases that will be later discussed in chapter 4.

Before the arrival of the Europeans, the Zulu practiced agriculture, pasturing and hunting. According to Birmingham and Marks (1977) the Nguni were dependent on the production of grains by women. However, the raising of cattle was the most prestigious occupation by men. Cattle were rarely sacrificed for its meat, but milk and cheese were basic for their diet, as well as the use of manure as fertilizer and combustible. The social and political relations were determined by the richness of cattle that each men had. Moreover, marriage arrangements were paid with cattle. On the other side, women had control over cultivated lands while the rest of the land was of communal use (pastures, fruit recollection and hunting areas)

From 1880, when the Zulus were finally vanquished, the tribes became subjects to the European colonisers and their descendants. A series of laws and racist practices were put in practice to subordinate black South Africans (Mamdani, 1996).

According to informants in the area, the IBs were established since 1910 (pers. comm. Secretary of the IBs). The Winterton Irrigation Settlement appears to have been established in 1903 when Natal was still a British colony. According to acts 44 of 1904 and 39 of 1908 of Natal, the Winterton Irrigation Settlement was provided by this constitution to have a board of management. Then, when in 1910, the Union government was established between the Boer republics of the Orange Free State and the Transvaal and the British colonies of Cape and Natal, the old acts were amended in 1926. Soon afterwards, in 1937 the government published the by-laws of the different IBs followed by different updates over the years (Department of Environmental Affairs, 1987).

It is estimated that during the apartheid era, 83% of agricultural land was in the hands of white commercial farmers (Chikozho, 2008). As water rights were under the riparian principle, land ownership (which black Africans did not have the right to own) was crucial for having access to water. Thus, the development of white commercial agriculture with the support of the colonial and apartheid legislations flourished at the expense of the eliminated black peasantry (Mamdani, 1996). In addition, white farmers and white controlled irrigation boards controlled the majority of water for irrigated agriculture. This was accelerated by the fact that huge investments were made in hydraulic infrastructures in their favour (e.g. Bell Park dam in the research area). On the other hand, black Africans had no such infrastructures and the nature of rain-fed subsistence farming in black communities (still practiced today) strongly limited the potential for improvement and intensification.

2.3. The sources of water and the IBs

Four IBs are organized in the catchment: two on the Little Thukela river (one upstream also known as section 1 and named the Little Thukela IB, and the other that covers the area after Winterton where water is transported through 2 canals named Winterton Irrigation Settlement (WIS)), and one on each tributary, the Sterkspruit IB and the Lindequespruit IB. Water for irrigation is usually pumped directly from one of these rivers and in the case of WIS IB, from one of the 2 canals (see figure 2 and 4).

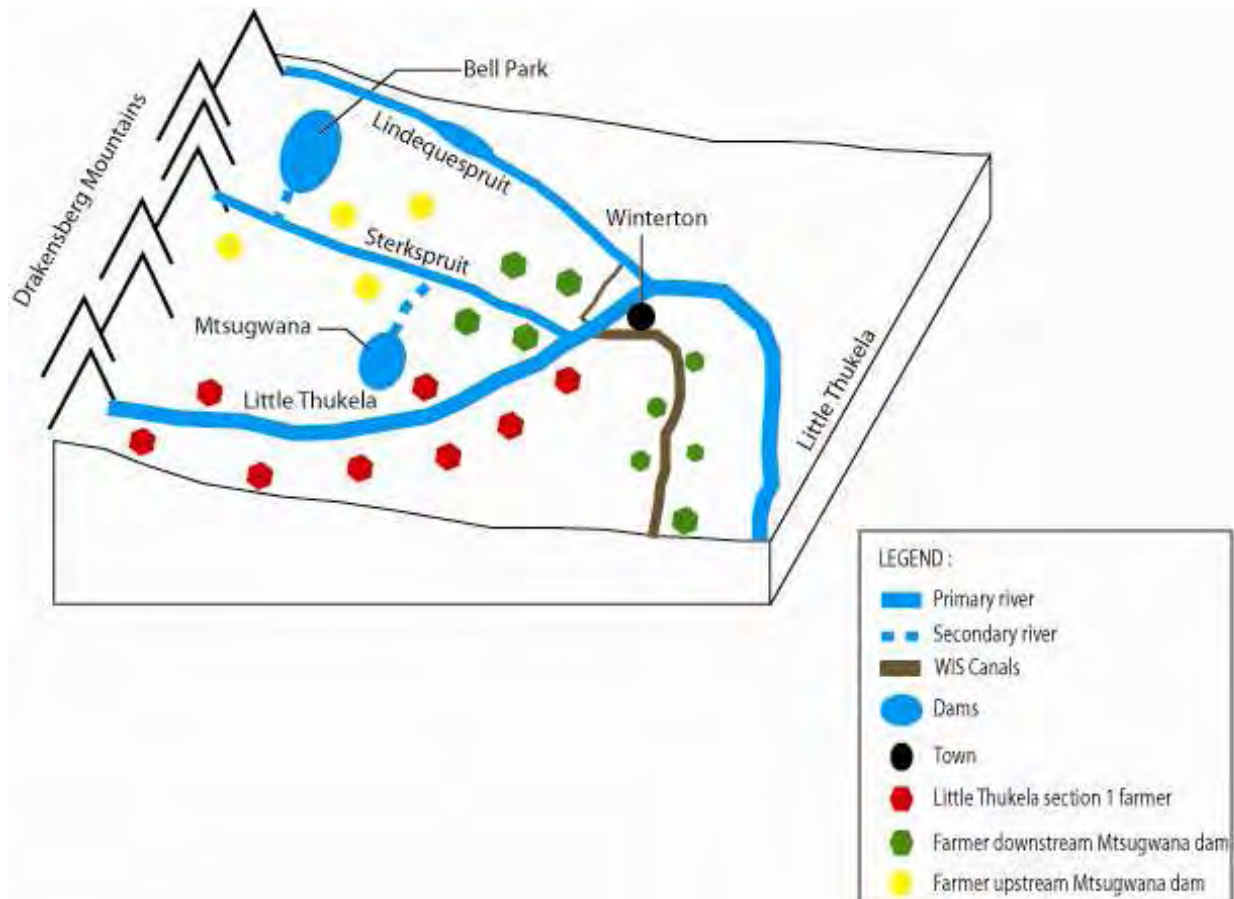


Figure 4. The Mtsugwana dam system. Source: Own elaboration.

It has to be noted that membership of the IBs has been determined in relation to the resources shared (rivers and dams). It means that farmers that share the same rivers and/or the same infrastructures have been organised in IBs. Though all IB members share the same rivers (either Little Thukela, Sterkspruit or Lindequespruit rivers), not all of them have concrete rights from the IBs dams. Thus, when water dam releases happen, additional monitoring and distribution challenges are added to water management. In addition, commercial farmers and communities in tributaries to the main rivers (Little Thukela, Sterkspruit and Lindequespruit) have not been included in the IBs even if their water extractions may affect the flows of the sub-catchments managed by the IBs. Usually, these commercial farmers -non-members of the IBs- have their own dams.

The Little Thukela is divided in 2 irrigation sections: The upper Little Thukela and the lower Little Thukela or Winterton Irrigation Settlement (WIS). Each section has its own IB and chairman, but they share the same by-laws and bailiff¹¹. The two irrigation sections have a total of 55 commercial farmers distributed in 3 components: sub 1 from upstream to the diversion weir just before Winterton, sub 2, also known as the big canal and sub 3, known as the small canal. A total of 3692 hectares of irrigation are register from both IBs (pers. comm. Secretary of the IBs).

¹¹ The bailiff is the person in charge of monitoring the water schedules allocated to each farmer. He/she does not distribute water as farmers use pumps to take water directly from the rivers in the research area. As a result, the main role is to monitor the hour and/or flow meters installed in the pumps and in different points in the river. For a detailed explanation of its activities see chapter 4.3.

The farmers from Little Thukela section 1 are upstream, meaning that water irrigates first their land and eventually reaches down with a weaker flow to WIS farmers (from sub 2 and 3). When water from the Little Thukela River reaches the WIS diversion weir, water is divided in 3 components, one follows the natural course of the river and the other two are the canals built at the beginning of the 1900s (see annex 4). Therefore, these two canals take water for the WIS, also known as the ‘Settlement’. The ‘big’ canal is approximately 24 km long and empties into the Kaalspruit. The ‘small’ canal is 7 km long and discharges into the Lindequespruit. In total, the present water registration from the WIS board registers a total of 1361 irrigated ha distributed among 30 farmers (pers. comm. Secretary of the IBs).

Most of the IB farmers in the Little Thukela River section 1 have private dams. Most of them have been constructed in the 1980s after severe droughts at the beginning of the decade. Yet, the Little Thukela and the WIS IBs do not own a major dam like the two other IBs.

The Sterkspruit IB has a total of 20 members with 25 pumps in its stream (pers. comm. Sterkspruit chairman). A total of 1699 hectares of irrigation are allocated and registered by Sterkspruit farmers (pers. comm. Secretary of the Sterkspruit IB). Most of the farmers do not have private dams (as they have the Bell Park dam) and therefore they take water directly from the Sterkspruit River and the tributary on which the dam is located.

The Lindequespruit has a total of 9 members under its IB. They have a total registration of 1100 irrigated hectares (pers. comm. Secretary of the IBs). Like the Sterkspruit IB farmers, most of the farmers in the Lindequespruit IB do not have private dams (as they have the Lindequespruit dam) and they take water directly from the Lindequespruit River.

Table 1. Official (paper) water rights of Irrigation Board’ members.

IB	# of members	# of ha of irrigation
Lindequespruit	9	1100
Sterkspruit	20	1699
Little Thukela	25*	2331
Winterton Irrigation Settlement (WIS)	30*	1361
Total	84	6491

Source: Own elaboration with data provided by the Secretaries of the IBs from the registration of water process undertaken in 2000. *The number of members of the Little Thukela and WIS IB has changed in recent years. Thus, this numbers have been adapted with information from other interviews and the personal counting of current members with the help of the chairpersons.

2.3.1. The Irrigation Board dams

The collective of IB members have built the Irrigation Board dams. As such, IBs own the dams, but the water stored (concrete rights) ownership is dependent on the farmers’ contribution to the infrastructure.

In 1986, the Sterkspruit IB built the Bell Park dam in the Mtoti stream, a tributary of the Sterkspruit River. The dam storage capacity is 7.5 million m³. Only 7 million can be used giving a total of 1400 ha scheduled and 5000 m³/ha per farmer per season (pers. comm. commercial farmers).

The Lindequespruit dam, as its name infers, it’s a long dam built in the Lindequespruit. It captures the low flows of this river. Nine farmers built it in 2004, and through this association

the Lindequespruit IB was established where only these members are included. The dam stores around 4 million m³ that are for the use of its members (pers. comm. Lindequespruit chairman).

The Mtsugwana dam is one of the two dams that farmers from Sterkspruit and Little Thukela IBs wanted to build. The Mtsugwana dam is located at the centre of the catchment in one of the tributaries of the Sterkspruit, the Mtsugwana. It is 26 meters deep and 38 hectares in area. It was built with a probability of shortage of 1 in 5 years drought, meaning that 4 out of 5 years there is supposed to be enough water for their users. It has a capacity of 3 million m³ shared by 41 beneficiaries (or commercial farmers) from both the Sterkspruit and the Little Thukela River (this includes upstream farmers of section 1 and WIS farmers) (pers. comm. commercial farmers).

Even though, it is said by the Dam Committee (in charge of the construction of the dam) that the Mtsugwana dam is for Little Thukela farmers, 12 (of 20) farmers from the Sterkspruit have water allocations. These vary from 10 to 259 ha and sum a total of 931 irrigated ha of a total of 2618 ha. Only 18 (of 30) farmers from the WIS joined in with a total irrigated ha that varies from 2 to 226 ha. From the Little Thukela only 11 (of 25) farmers joined in with an allocation that varies from 20 to 157 ha (data from the schedule dam sheet).

As shown in figure 5, the Lindequespruit dam is situated on the Lindequespruit River. As a result, most farmers take water from the dam directly from the river, though there are some members that pump directly from the dam. The case of the Bell Park and Mtsugwana dam is different as they are situated in tributaries of the Sterkspruit River. As a result, water from the dam is transported to the tributary (Mtoti and Mtsugwana respectively) that later joins with the Sterkspruit River. All Sterkspruit IB members that have water rights in the Bell Park dam take water from the Sterkspruit River. As for the Mtsugwana, the system designed by the Dam Committee is a little bit more difficult. Sterkspruit IB members that have bought water from the Mtsugwana, either take water directly from the dam (if their farms border on it) or directly from the Sterkspruit River.

The WIS IB members take water from the IBs canals just as they normally do with their scheduled allocations in the Little Thukela River as the Sterkspruit joins the Little Thukela before Winterton. This poses management and monitoring challenges that will be discussed in the next chapter. Finally, as there is no pipe that could transport water from the dam to the Little Thukela River (see figure 4), farmers from section 1 do not take their dam allocations from the dam, but from the Little Thukela River in a complicated and unsustainable system introduced by the Dam Committee (pers. comm. Little Thukela section 1 farmers). This will be later explained in chapter 3.2.1.

2.4. The commercial farmers

In total, 18 commercial farmers were interviewed. Farmers are distributed in the research area and therefore come from different rivers and IBs (either the Lindequespruit, Sterkspruit, (upper) Little Thukela and WIS) and from tributaries of the former that do not belong to the IBs (see figure 2). In addition, farmers with and without concrete rights from the Mtsugwana dam were also selected to provide richness in the analysis and capture various perceptions and perspectives on this infrastructure.

On average, commercial farmers are the 4th farming generation in the area. They enjoy ample extensions of land ranging from 30 to 1500 ha depending of their locations in the catchment,

type of exploitations and agricultural system, and farming history in the area. Average number of farms is 2 per family. Arable land is 20 to 61 ha, 8% bigger than irrigated area under register water use. This means that commercial farmers have relatively more land than they can irrigate. Thus, during the dry season this land is used for grazing or rests in fallow. Owned water infrastructure is formed by at least one private dam, 3 pumps and 6 pivots in average. Finally, commercial farmers employ an average of 19 permanent workers.



Picture 2. A central pivot, common resource of commercial farmers that allows them to irrigate large areas.

In general, two types of farmers can be identified according to their systems of production. Thus, ‘dairy farmers’ and ‘crop farmers’ can be found in the catchment. The first need a steady source of water to irrigate their pastures or fodder crops to feed cows all year round. The majority of dairy farmers cultivate their own pastures rather than rely on external alimentation. According to commercial farmers, dairy farmers need 6000 m³/ha in winter while a crop farmer might need around 4000 m³/ha (pers. comm. Sterkspruit dairy farmers). Most of dairy farmers also crop maize or soybean during the rainy season and wheat during the dry season. According to commercial farmers, the tendency reflects a shift from crop farming to dairy farming in the research area. Though, crop farming of maize/soybean and wheat still dominate agriculture systems.

The crop farmers have a yearly rotation of maize and/or soybeans in summer (rainy season) with wheat during winter (dry season). As mentioned before, they sell their harvests to seed companies (when they do seed maize), transnational and private companies, and farmers cooperatives. Dairy farmers sell their milk to private companies and industries established in the city of Johannesburg. Only one of the commercial farmers interviewed has its own cheese processing plant to which a part of its production is destined (pers. comm. commercial farmers).

It is noticed that 7 of the 18 commercial farmers interviewed are in a process of expansion. Four of them are dairy farmers. Yet, the general perceived feeling of commercial farmers is that the government does not support their ‘food security’ activities. It rather constrains them ‘because of what happened in the past’. In line with redress policies, “water and land is allocated for new black farmers. That is a problem for commercial farmers because we are not allowed to expand anymore” (pers. comm. commercial farmers). Nevertheless, when asked if they have felt a change when apartheid finished and the new democratic government

was installed, 10 out of 18 stated that there “has not really been a change” (pers. comm. commercial farmers).

One of the issues that preoccupy commercial farmers across the whole nation including the area of study is the recurrent criminal attacks on commercial farmers. From the 18 interviewers, 5 have suffered a criminal incident towards them and/or their close relatives. As a result, this has created a sort of tense environment amongst commercial farmers. As shared by one of them, “in every farmer’s mind lies the fear that one day it could be your family that could be attacked next.” For that reason, and because they accept “that some rectification has to be done”, some of them agree with the reallocation of land and water. Others have already started their own reforms “to prevent chaos in the area”. These include the support of agricultural local schools, free mentoring and support to some emerging black farmers, and even the development of governmental funded business projects for the region where communities and/or HDI are included and both white commercial farmers and their HDI business partners (entrepreneurs) benefit (pers. comm. commercial farmers).

2.5. HDI settlements: Amaswazi and Potshini community

In the research area, it is noted that Bantustans are located upstream in the catchment, where hilly terrain is the main feature. To no surprise, all commercial land is in the valley, absent of sharp slopes where commercial agriculture would have been more difficult to develop. Therefore, it can be said that the separation of ‘white and black land’ and the concentration of the latter upstream in the catchment, corresponds to the political will to develop white commercial agriculture in the research area (see figure 2 and 3). Thus, former rural structuring policies along the historical consequent socioeconomic set up, identity and power structures are reflected in the landscape.

The former homeland of Emmaus is easily found in the upstream Lindequespruit catchment for the contrast between commercial agriculture and the sudden appearance of continuous circular huts agglomerations one after another. Emmaus is a conglomeration of many communities with their own chiefs and often composed of different clans. It is a highly dense area that shares a limited space of land like many homelands throughout the country. In the past, as it will be presented in the case of Amaswazi community (see chapter 4.2.1), conflicts between clans, and tribes wars have developed in this area mainly because tribal competition over land domains (pers. comm. Amaswazi inhabitants).

The community of Potshini is located in the former homeland of Emmaus in the northwest of the Little Thukela catchment, in a small tributary of the Lindequespruit River (see figure 2). It occupies a total area of 10 km² of hilly terrain of acidic soils. Most streams are perennial, yet extreme low flows frequently occur in winter between June and August (Kongo and Jewitt, 2005). The communities of Kwanokopela and Mhimeleni are located in the south border Potshini. In the past, the three have shared the grazing lands of the mountain of Nkuzi (pers. comm. Potshini inhabitants). Today, under the Land Redistribution program of the Department of Rural Development and Land Reform (DRDLR), 77 members of the community of Potshini have been awarded approximately 600 ha of grazing land in commonage (see figure 5).

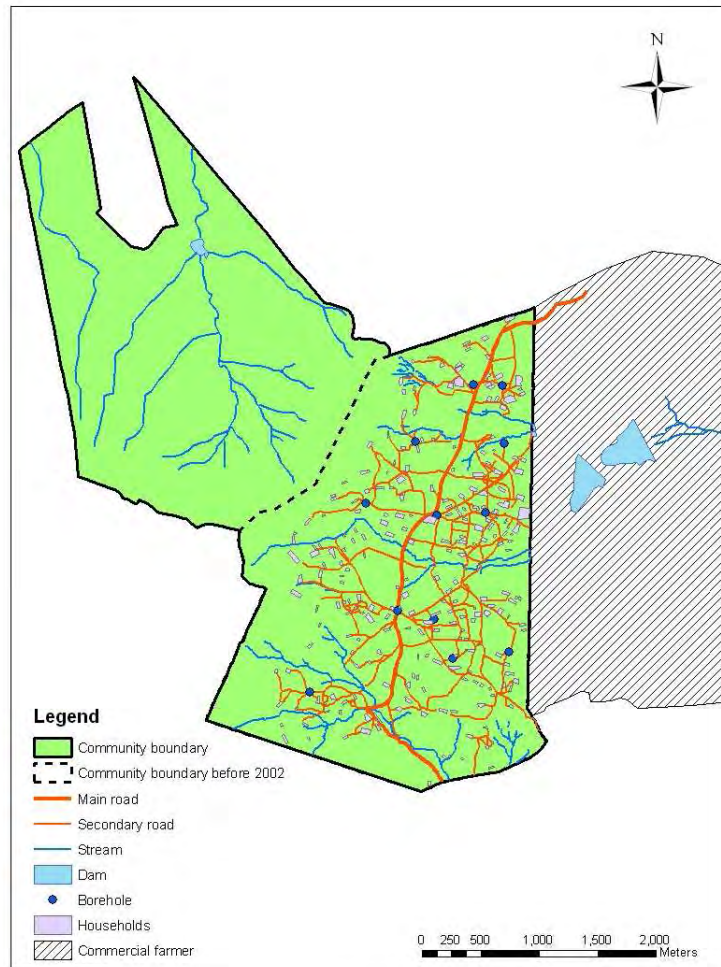


Figure 5. The community of Potshini and the grazing land area added in 2002. Source: Besnard, 2010.

The community of Amaswazi is located in the centre-west part of the Little Thukela catchment, in a tributary to the Sterkspruit River (see figure 2). Contrary to most of the black communities congregated in the upstream area of the catchment where the former homelands were and are still located, Amaswazi occupies today a privileged area that used to be owned by commercial farmers in the previous era. Amaswazi has been granted two commercial farms as part of the Land Restitution reform implemented by the government. Thus, the ‘landless tribe’ has passed from a status where they were immigrating from place to place looking for shelter to a state in which they owned *communally* an area destined for settlement and another that is supposed to be under commercial agriculture production. The settlement area acquired in 1998 occupies an area of 5 km² where households also have individual agricultural plots and pasture communal areas. The agricultural development land corresponds to the second farm restituted for the community by DRDLR in 2008 (see figure 6). It counts with a total area of 400 ha and a scheduled water registration of 100 ha. It also has 2 private dams, 2 pumps and 2 pivots from which water for irrigation could be used (pers. comm. manager of the second farm). Though Amaswazi enjoys both the land, water and infrastructure resources, this transfer of resources has not yet transformed the lives of the new beneficiaries (see chapter 4.2).

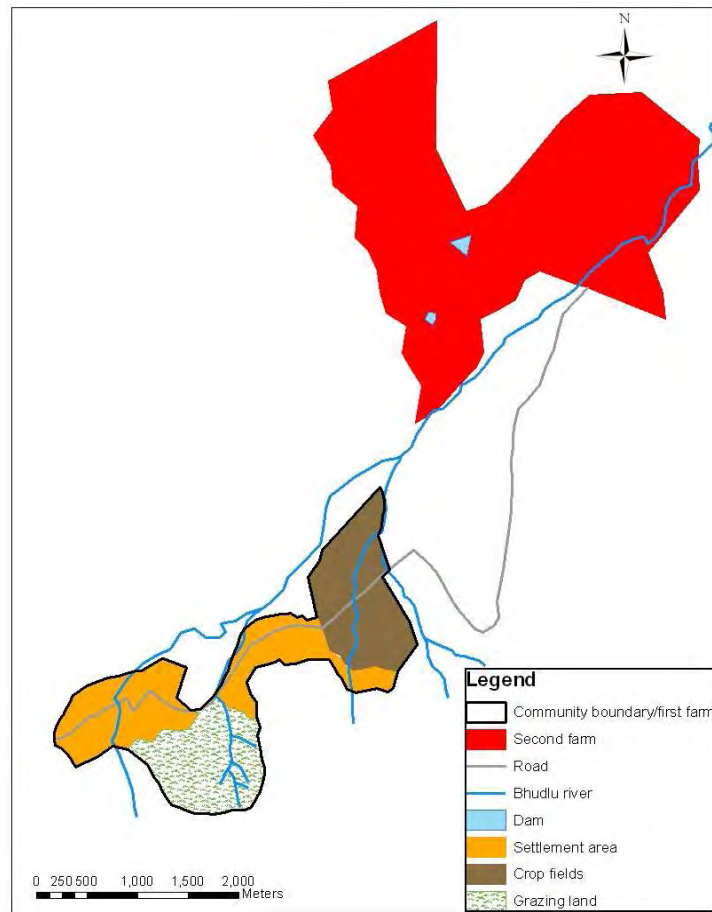


Figure 6. The community of Amaswazi distinguishing between the first and second farm restituted. Source: Own elaboration.

At the downstream end of Potshini, commercial farmers are located. A single commercial farmer neighbouring the community owns a total area of 1,560 hectares. The property includes four surface dams allowing the farmer to grow irrigated crops in both the summer and winter season (Kemerink *et al.*, 2009). Amaswazi is located at the southeast of the heart of the best agricultural exploitations of the Sterkspruit IB farmers. Like the neighbouring farmer of Potshini, also commonly called a ‘border farmer’¹², farmers surrounding Amaswazi also have private dams and/or concrete rights with the IB various infrastructures. Farmers have registered water rights granted under the previous water act and recognized as an existing lawful use (Kemerink *et al.*, 2009).

Though both communities differ in terms of availability of resources, similar socioeconomic characteristics are shared. Partly because South Africa is a market-oriented economy, most of the black rural communities (which have an educational deficit resulting from apartheid policies) cannot participate in the economy other than being labourers at the bottom-end of the chain. The level of interdependence of rural communities and distant large cities remains high as most of the rural communities live in uneconomically productive land and hence

¹² Border farmer is a local term used by white people or commercial farmers to refer to commercial farmers whose farms border on upstream communal areas or other black settlements and communities like Amaswazi. The term is also used to refer to the problems (theft, damage to property, trespassing, security, etc.) involved when a farm is located directly next to communal areas (Steinberg, 2002). Farmers argue that “even black farmers do not want to be border farmers because they know what it means” (pers. comm. border farmers).

mainly rely on remittances from the extended family members employed in urban areas and on social security grants provided by the government (Ramutsindela, 1997).

To no surprise, smallholder farmers and migrant workers inhabit both communities. Herding cattle and small-scale agriculture are the main activities. Agricultural plots are relatively small (0.5 to 2 hectares) and the main crops grown are maize and beans for subsistence. Agricultural activities are not the main source of income. In Potshini, an astounding 82% of the households receive social grants from the government and 45% of the households have access to remittances from family members working elsewhere (Mudhara *et al.*, in review). Though Amaswazi has been scarcely researched and it was not the purpose of this thesis to calculate this type of socioeconomic estimations, it is noticed that 12 out of 17 of interviewers in the community rely on remittances as their main source of income. In addition, 13 out of 17 receive social grants from the government (pers. comm. Amaswazi inhabitants).

Chapter 3. Strategising water control through concrete structures

“...as in Africa, where water development works were used to assert land claims, influential or richer farmers can ensure that it is their rights that are fixed in permanent concrete structures, such that technology itself (the design of weir, sluices or field layouts) is able to do the work of social differentiation (Mosse, 2008: 944).”

This chapter analyzes water management and control, as well as the strategies of commercial farmers in the research area. In line with the concepts of hydraulic property, technology and power described in the analytical framework, emphasis is placed on describing the processes of re-creation of water rights and re-arrangement of water systems and its management rules. In doing so, we will detail who is in control, what rules and regulations prevail and what have been the consequences of recent changes and for whom. Therefore, this section is organised in the following order: First, water distribution in the catchment is described. This is presented in section 3.1. Then, the creation of water rights through the development of infrastructure is detailed in section 3.2. In section 3.3, water governance and monitoring in the three rivers and by the IBs is assessed. Finally, water strategies exercised by commercial farmers in the research area is analyzed in section 3.4.

3.1. Water allocation in the Little Thukela catchment

In this section the distribution of water amongst members of the IBs will be described. Emphasis is placed on the Little Thukela River as water distribution takes place between two IBs and, thus the livelihoods of more members depend on the same source. First the Lindequespruit and Sterkspruit water distribution will be described. This will be followed by the Little Thukela water allocation. It should be noted that the measurements of actual water rights falls outside the scope of this thesis. Thus, allocations on paper cannot be cross-checked with actual water allocations. The focus is on the processes, organising practices and water strategies that take place in the field by commercial farmers.

Allocation in the Lindequespruit IB

The Lindequespruit River is shared by 9 farmers in the IB. Upstream of these farmers, the Emmaus tribal authority is located as well as a forestry area managed by the international company SAPPI. Water use and distribution have only been studied within the IB. In the Lindequespruit IB, 9 farmers share 1100 irrigated ha scheduled (pers. comm. Secretary of the IB). Most of them are mainly crop farmers and no great differences in land allocation or water are found. Yet, one commercial farmer, chairman of the IB, positioned as third in the river and whose farms directly get water from the dam, is diversifying his agricultural production in rose production. It has to be noted that this type of production has a high water demand. With the exception of this case where concentration of land and water, as well as financial and administrative resources is observed, there are not stark differences amongst Lindequespruit IB members.

Allocation in the Sterkspruit IB

The Sterkspruit IB has a total of 20 members who share water from the Sterkspruit River and the Bell Park dam. Together, they share a total schedule of 1699 irrigated ha (pers. comm. Secretary of the IB). In addition, Sterkspruit farmers have under their sub-catchment the newly constructed Mtsugwana dam. Twelve Sterkspruit farmers also have concrete rights

from this dam. It is thus appreciated that amongst all farmers in the catchment, Sterkspruit farmers have developed more hydraulic properties to support their irrigation and thus, today they enjoy a more secure position regarding their access of water in contrast to farmers from Little Thukela. This position has also been used to direct new water rights creation initiatives that have been successfully developed in the catchment (see section 3.2.1).

Strong water allocation differences amongst Sterkspruit IB farmers are not apparent. It was also perceived as a strong and cohesive IB in the catchment. Most of the farmers are dairy farmers, share information and management practices. Still, within the bulk of Sterkspruit farmers, three commercial farmers captured my attention for their management positions, leadership and water allocations. The three are part of the Dam Committee in charge of the construction of the Mtsugwana dam, which is now in charge of the management of the dam. One of them is the chairman of the Sterkspruit IB and the other two enjoy strategic geographical positions in the catchment for water extraction (read Box 1 for details).

Box 1. Geographical position as means to achieve water control

One farmer's farm is located at the junction of the Little Thukela and Sterkspruit River. In this section of the Sterkspruit river a weir is located to prevent water from flowing to the Little Thukela. As a result, a sort of pool is created to bring water back which this farmer mainly uses. According to Little Thukela section 1 farmers and the bailiff of the Little Thukela IB, there have been issues in the past with this farmer as it is suspected that he also pumps water from the Little Thukela River. Yet, as water is not a static resource it's difficult to determine given his location which water from which river he is actually pumping.

The other farmer has the biggest water share in the Mtsugwana dam with a total of 259 irrigated ha. The dam was built on his property where the Mtsugwana tributary passes. He did not sell the area where the dam lies to the IB as he stated it was unused. He takes water directly from the dam and it is noted that the bailiff from Little Thukela IB is not allowed to measure his intake of water as this is supposed to be done by the Sterkspruit IB bailiff. Yet, as perceived by the Little Thukela bailiff - responsible for the monitoring of water allocations for the Little Thukela section 1 and WIS- he should have the right to also measure this and other users that take water directly from the dam to do his job.

Source: Information from this box was collected through in-depth interviews with commercial farmers in the research area.

It is observed that through geographic strategic locations that allow direct or better access to water from the river or to the infrastructures, *water control* is exercised. Likewise, through *economic and politico-institutional* control expressed in the financial, managerial and decision-making power of these actors, water control is achieved as well. Moreover, it is important to highlight that this water control exercised by these particular farmers is also used as a resource to maintain and extend their access to water and thus, water control.

Allocation in the Little Thukela River

Various actors in the catchment share the Little Thukela River. The river first passes through the settlement of Loskop, then it goes to the Little Thukela section 1 farmers and then water is transported through two canals for the use of the WIS IB farmers. Inhabitants from Winterton and Kethani (the black settlement outside Winterton) also use water from this river.

Farmers from the Little Thukela section 1 have a preferential position, as they are upstream of WIS farmers. They can also take water directly from the river, while WIS farmers can only take it from one of the two canals. In addition, WIS farmers have in general smaller farm sizes of an average of 50 irrigated scheduled ha. In contrast, average irrigated ha in the Little Thukela is 94 ha, almost double of WIS¹³. It has to be noted that between irrigated ha and arable land there is a difference that varies from 20 to 61,8% amongst the commercial farmers from both IBs. As a result, Little Thukela IB farmers have accumulated a stronger economic position and power as compared to WIS farmers.

Among Little Thukela IB farmers, there are strong land and water allocation differences. It is noticed that 2 new farmers (one of them from Indian descendents) in this section have small land and water allocations of 30 irrigated ha. This is contrasted by other farmers who reach 300 scheduled irrigated ha (data from schedule sheet).

Likewise, the WIS IB also presents strong land and water allocation differences. Originally, the British government established the WIS after the Boer war for former soldiers who fought in the war. As a result, original land allocations were 30 ha on average (pers. comm. WIS small farmers). Today, most of the farmers of the WIS have in average 50 ha of irrigated water. Yet, it is noticed that downstream farmers from the big canal have expanded their lands and their water allocations to 150 ha (Allocations data sheet). Despite their location at the downstream, these farmers are close to the Thukela River from which some take water. Yet, the main and official source of water is the Little Thukela (pers. comm. WIS commercial farmers).

Historically, the biggest water share from the Little Thukela River has gone to the Little Thukela section 1 farmers. Already by the end of the 1980s, due to substantial irrigation development in this section of the river, multiple complaints, conflicts and calls for water supply support projects from WIS farmers called the attention of government officials. “The flow in the Little Thukela River at the WIS diversion weir has been reduced to a negligible amount during dry season” (Department of Environmental Affairs, 1987: 3). Today, Little Thukela IB farmers have 63% of scheduled water. It has to be noted that according to Sterkspruit commercial farmers (that exercise important water management positions in the IB), the Sterkspruit River is allocated for Sterkspruit IB members even if the Sterkspruit also joins this river. The Sterkspruit chairperson who manages the distribution of water for the Sterkspruit river confirmed that commercial farmers from this IB are not obliged to let water pass beyond the connection point between the two rivers. Furthermore, “Bell Park dam water releases are calculated in such a way that water is let out enough to reach the last farmer of the Sterkspruit river” (pers. comm. Sterkspruit chairperson). In consequence, water for WIS IB members has to come from the Little Thukela River. This is confirmed by Little Thukela and WIS IBs members (pers. comm. Little Thukela and WIS IB members) and by the historical negotiation-conflict relationship that both IBs and its members have had in the past.

¹³ This has been calculated from the scheduled sheet of the LT and WIS Boards.

It is therefore concluded that Little Thukela section 1 farmers have stronger water control in the river. Though this has been relatively changed with the construction of the Mtsugwana dam, which directly benefits Sterkspruit and WIS farmers (see section 3.2.1).

3.2. Concrete allocations

According to commercial farmers, water shortages started in the area after the introduction of the central pivots at the beginning of the 1980s. This coincided with severe droughts in 1982 and 1983 that affected water use in the area. To keep up the development of their own farms, farmers started to build their own private dams till some farmers in the Sterkspruit decided to build a major dam to prevent future droughts, and therefore additional risks for their livelihoods (pers. comm. commercial farmers).

The Bell Park dam was built in 1986. At that time, the South African government was more supportive of commercial farmers and gave Sterkspruit farmers a loan for its construction. Under the previous Water Act (act 54 of 1956), organised farmers through IBs could apply for a capital subsidy of 1/3 (of the total cost of a dam) from the government. Sterkspruit farmers saw that opportunity and built their dam. However, they are still paying for this infrastructure with a yearly fee of ZAR200/ha/year, about €20/ha/year¹⁴ that covers loan payment and O&M (pers. comm. Sterkspruit chairman, R. Stockil.)

The pool

As the Sterkspruit chairman states “it’s almost impossible that any farmer spends its entitlement in a season.” That is why for years the Sterkspruit IB developed the ‘pool’ system. It means that at the start of the dry season, Sterkspruit farmers have to declare how much of their entitled water from the dam they are going to use. The water they do not use can be sold to other Sterkspruit farmers or farmers from WIS for which they have to pay the corresponding annual fees per ha. This is theoretically possible as the Sterkspruit River connects with the Little Thukela River before Winterton. As a result, Sterkspruit farmers would let water from its river pass by to the Little Thukela River for the WIS farmer’s use. Yet, there are managerial constraints that question this system and that will be addressed in the following sections.

Even though the ‘pool’ strategy might originally have been designed as an economic strategy, (farmers can free themselves to pay the annual fees for water they would not be using) an even more interesting benefit comes out from this system. In order for DWA to implement any reallocation of water, they first need to call for what is known as a ‘compulsory water rights registration’ (pers. comm. DWA officials). When this happens farmers have to report: (1) the total amount of water they are entitled to and (2) the actual amount of water they plan to use. Those leftovers that are without use are the first water that gets to be re-allocated because it is assumed that this water is lost in the system. As a result, the ‘pool’ strategy is seen as a water strategy implemented by Sterkspruit farmers to protect their formal water rights.

Despite multiple land claims in the area¹⁵, less support from the government to commercial farmers, Zimbabwe’s commercial agriculture catastrophic example¹⁶ and multiple and

¹⁴ Rate: €1:ZAR: 9.58 October 18th, 2010.

¹⁵ According to commercial farmers there are 13 land restitution claims in the Okhahlamba area (pers. comm. commercial farmers).

recurrent farms attacks in the area, commercial farmers around Winterton show rather a tendency towards water use expansion than an static commercial agriculture. The last five years particularly reinforce this argument.

As Sterkspruit farmers started to use their entire water share, the ‘leftovers’ diminished and the ‘pool’ began to constrain other farmers that were counting on this extra water. As a result, farmers pushed for the construction of two dams joining forces from the Little Thukela and Sterkspruit farmers. At the end, only one dam got built in 2008, the Mtsugwana dam. But before, another big construction took place in the catchment. The Lindequespruit dam was finalized in 2005.

According to Lindequespruit IB chairperson before the Lindequespruit dam was constructed, “the people from Lindeque only planted 50 hectares of wheat in winter”. In contrast, the dam stores around 4 million m³ that are for the use of its members. This has increased the productivity of the land with an expansion of the cultivated area in both seasons. Yet, as highlighted by Lindequespruit members, “water comes at a cost” (pers. comm. Lindequespruit farmers).

Under the new democratic government and with the abolition of the Water Act of 1956, the government has stopped his financial support for commercial farmers. As a result, farmer’s cooperatives or private companies involved in the agricultural sector have financed the Lindequespruit and Mtsugwana dam. In the case of the Lindequespruit, farmers got a loan from the seed companies with which they have contracts to sell their harvests. In addition, each farmer contributed and paid proportionally according to their allocations to the dam. Farmers put in their tractors and their labour to build it. At the end, it took two years to finish the dam because of lack of funds, however in exchange of that effort, farmers have been able to expand their cropped area to two seasons (pers. comm. Lindequespruit commercial farmers).

The difference between the financial sources used to construct these infrastructures (one governmental and other private) uncovers a quite different hydraulic property between both water storage resources.

3.2.1. The quest for water: Forcing the construction of the Mtsugwana

Water problems are not only caused by a combination of natural and physical processes of water abstraction and storage but are also physically, ecologically and human made, embedded in the locally specific outcomes of social and political histories and processes (Mollinga, 2008).

The construction process of the Mtsugwana dam and the changes introduced through its system merit some attention for its relevance to answer the first question of this study. It serves as illustrative case to understand the organizing practices and water strategies some commercial farmers are developing to maintain and even expand their control over land and water resources.

¹⁶ In Zimbabwe, the failure of President Robert Mugabe’s government to address the agrarian reform issue in the early years of independence, took a sudden turn in 2000 when the government expropriated 4,500 commercial farms leading to the destruction of commercial agriculture. Agriculture represented 40% of the exports, 18% of the country’s gross domestic product and a quarter of former employment (Russell, 2010).

According to the committee in charge of the construction of the Mtsugwana dam, built in 2008, it is the last water license in South Africa without a Black Economic Empowerment (BEE¹⁷) component (pers. comm. commercial farmers). Although only codified in the legislation as Broad-Based Black Economic Empowerment (BBBEE) in 2007, it is noticed that already by 2005, DWA had introduced the policy of Water Allocation Reform (WAR) to contribute to BBBEE (DWA, 2005). In line with WAR, the BBBEE component was introduced as a requirement for all new constructions of water infrastructure. In agriculture, it basically meant that all commercial farmers or IBs that wished to build a new dam needed to leave a share of the water stored for the use of HDI communities or emerging farmers. However, the Mtsugwana is a dam built by commercial farmers and for the use of commercial farmers. No water share has been reserved for any HDI or community. As BBBEE was formally included in legislation in 2007 and the dam was built one year after the law was passed, its construction is quite outstanding as one of the core conditions to build a dam in these days is the BEE component (pers. comm. Little Thukela section 1 farmers that are currently struggling to get new dam permits). *So, how did the commercial farmers get their dam without having to share it (at least not yet)?*

The Mtsugwana dam cost a total of ZAR12,8 millions, about €1,280,000¹⁸ to be built. Like the Lindequespruit dam, farmers did not receive any loan from the government but rather the loan came from AFGRI, a private agriculture company. Farmers were asked an initial contribution in proportion to the irrigated ha they bought plus they have to pay yearly costs of R600/ha/year (about €60/ha/year). Not all commercial farmers, especially those from WIS, could afford this expensive rate and as a result, only 18 (of 30) farmers from the WIS joined in, from Little Thukela only 11 (of 25) farmers and 12 farmers (of 20) from Sterkspruit (pers. comm. Dam Committee members).

Commercial farmers claim that the only reason why they were allowed to build the Mtsugwana dam is because the dam is used to fulfil the existing water rights they have. The argument used is that the river flow drops drastically during the dry season around August¹⁹. Thus, they are not able to use their registered water. This is confirmed by DWA (2004) Internal Strategic Perspective study for the Thukela Water Management Area (WMA) that shows that the Little Thukela catchment has a negative balance of 30 million m³/a²⁰. In

¹⁷ The premise of BEE was at a first time (in the years to come after the end of apartheid) regarded as simple. It meant the transfer of resources from perceived white-owned business and the South African State to HDI. The pressure to implement was both financial and moral. It was thought as a way to amend or rectify the social inequalities of the past, but also it was perceived as a proof of commitment to the 'new era'. According to some critics, most notoriously Moeletsi Mbeki (brother of former president Thabo Mbeki) compliance from business people offered them a chance to keep safeguarding their interests and secure future contracts. In his words "the object of BEE was to co-opt leaders of the black resistance movement by literally buying them off with what looked like a transfer to them of massive assets at no cost" (Mbeki, 2009). But when BEE started to be critiqued as a policy for the empowerment of the few, it was codified in legislation in 2007 as Broad-Based Black Economic Empowerment (BBBEE). As a result, this regulation, originally initiated by the ministry of trade and industry, has also been embraced by other ministers like the DWA.

¹⁸ Rate: €1:ZAR: 9.58 October 18th, 2010.

¹⁹ It has to be noted that this 'sudden' drop in the river happens at the end of the dry season after months of intense water use for irrigating wheat or pastures.

²⁰ According to the ISP study in 2004, available water in the Little Thukela (local yield) is 8 million m³/a. Nevertheless, this number already poses questions as the water stored in the three dams (Bell Park, Mtsugwana and Lindequespruit) sums (7.5 + 3 + 4 million m³ respectively) 14.5 million m³/a. Since calculated local requirements are 38 million m³/a, the balance is negative with a total of minus 30 million m³/a. Yet, local requirements have been calculated in accordance to the water registration of 2000 in which only commercial farmers use was counted. In addition, as it will be explained in section (3.4), commercial farmers did strategize

addition, the president of the Dam Committee stated: “if constructing the dam was because we wanted to expand, they would not have allowed it” (pers. comm. Dam committee members). Though that might be true to a certain extent in some individual cases, if the former registered rights are compared to the current water registration of the dam, it can be noticed that for other cases, the new dam clearly represents an expansion of water rights. For example, a couple of farmers from the WIS passed from having 149,6 and 56,6 irrigated ha to 226 and 113 ha respectively (data from the schedule dam sheet).

Therefore, it is clear that other reasons explain the existence of the Mtsugwana dam. First of all, it has to be taken into account that this area is an important supplier of basic staple food. To a certain extent, the government cannot avoid the normal expansion that commercial farmers have to undertake to survive in the market economy. Second, it is noted that in the Internal Strategic Perspective Study of 2004 by DWA it is stated that “the construction of farm dams would be acceptable however since this would improve the assurance of supply to water users in this area” (DWA, ISP study, 2004: 6) Third, commercial farmers did not do the work alone. The Dam Committee (well-connected and economically prosperous commercial farmers) hired the well-known MBB consultancy to do everything: from the environmental and archaeological studies, to the engineering, and negotiations with DWA to secure the construction license for the dam. When asked how they got their dam license, representatives of the Dam Committee answered that the engineers that designed and built the dam are regularly subcontracted by DWA. Fourth, commercial farmers started to construct the dam before it was even approved. As it will be discussed later, this is a common strategy commercial farmers undertake when they build dams (either private or IB dams). Finally, commercial farmers have learned to substitute governmental aid to finance this type of infrastructure, with private or international companies from the agricultural sector. Therefore, they have become financially independent (though not necessarily wished) from the government and all they asked is the permit, not a loan like in old times. This entails of course a certain amount of financial resources at the disposition of commercial farmers, collateral and the right business relationships that can finance the construction of major infrastructures.

To finance the dam, commercial farmers needed the participation of a number of farmers that allowed them to pay the loan collectively. The amount of possible irrigated hectares was a fixed number as well as its cost according to the hydrological studies, water availability and feasibility of the infrastructure. Therefore the question was rather on how the irrigated ha would be distributed amongst the participants. According to all commercial farmers interviewed (with or without concrete rights from the Mtsugwana), everybody was invited to participate. Yet, as mentioned above, only some farmers joined in. Besides from the high financial endorsement required, other factors influenced participation either to refuse or integrate the new system.

First of all, generally there is the unwillingness to pay for water. Farmers are reluctant to or do not want to accept that water, under the NWA, must be paid for to the government. Therefore, they do not like to pay for water and thus, the high price fees of the Mtsugwana dam were not attractive. Some farmers were willing to invest because they acknowledge the

with water registration and the schedules they registered not necessarily coincide with the water they use. It is noted that “since it is not feasible to supply shortages in the Little Thukela, Sundays or Mooi Key Areas (catchments) from the surpluses in the Upper Thukela, Buffalo or Bushmans Key Areas, there is at least 38 million m³/a available for allocation in the Thukela WMA” (DWA, ISP studies, 2004).

value of water for their livelihoods, seek the expansion of their activities, and know they do not have another choice than to pay for it. On the contrary, other farmers even if they were willing, they did not have the means to buy water to support their farming operations. Finally, and most importantly for the Little Thukela section 1 farmers, the lack of physical connection (through a pipe for example) in the system does not ensure that the rights these farmers are buying from the dam are actually received (see figure 5).

As it is shown in figure 5, the system does not allow farmers from Little Thukela section 1 to take water from the dam. In order to prevent any unwillingness to participate from this group - key to finance the dam-, the Dam Committee introduced new rules to the system. It was determined that as soon as the Mtsugwana dam would be open, those farmers from Little Thukela section 1 -also with -official needs being unmet- that bought water from the dam could take their 'concrete allocations' to the dam from the Little Thukela River without the need to let water pass for the two canals of WIS (see figure 7). As no water would be flowing down from the Little Thukela for the WIS, the farmers from Little Thukela section 1 would compensate downstream users with the water they would buy from the Mtsugwana. To make it even more attractive, farmers from section 1 Little Thukela would have a discount of 25% from the annual fee (€60/ha/year) they would have to pay. This was decided as such since they were not receiving water stored by the dam, and therefore, they had more than "1 in 5 years" probability of not getting their concrete allocation.

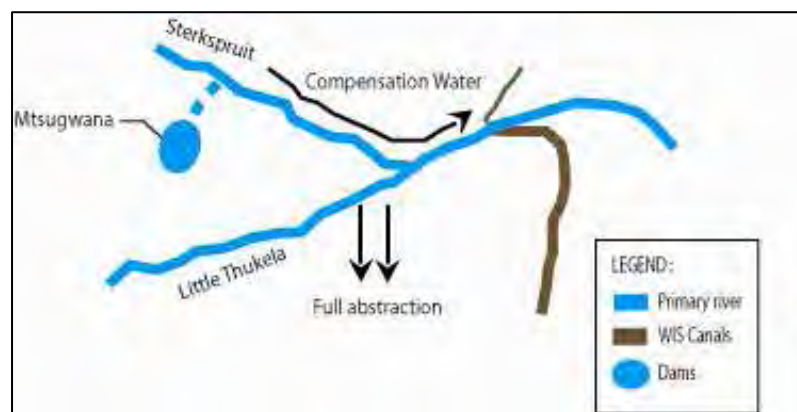


Figure 7. Distribution of water arrangement in the Mtsugwana Dam. Source: Own elaboration.

At a first moment, 60 commercial farmers were convinced of the proposition and they were ready to join in. Nevertheless, as discussions and meetings continued, doubts started to arise and the Dam Committee feared that the deal was pulling off. Then, *decision reasoning* was influenced when the Dam Committee introduced *another rule*: water rights would be changed in the system. In rainy season (summer), farmers would be using their 'normal' schedule (their registered water with the IB and therefore, with the government). By contrast, during the dry season starting from the day the dam would be open, restrictions would be applied. Dam allocations -the concrete rights- would take place instead of the former and non-participants in the Mtsugwana dam would be restricted to the point that they would not be allowed to have any water.

This meant the reconsideration of many farmers in the Little Thukela and WIS IBs because it meant that if they did not buy water from the dam, they would have zero irrigated hectares during the period the dam is open. Farmers from Little Thukela section 1 and WIS without membership in the dam would be alienated from their former water rights. In the end, the *mobilization of bias* -in the words of Bachrach and Baratz (1962)- that was built to shape decisions, resulted in the construction of the dam. The “muscle tactics” applied by the Dam Committee resulted in a total of 41 farmers buying concrete rights from the Mtsugwana.

One of the questions raised when looking at the system (see figure 5) is how can it be assured that allocations from both dams (Bell Park and Mtsugwana) with a shared path (the Sterkspruit) go to their destined owners? The answer is: it cannot be. As explained by commercial farmers from the Dam Committee, it is a challenge to coordinate both the water releases and the commercial farmers. Most of Sterkspruit farmers have rights in the Bell Park, yet only 12 have rights in the Mtsugwana. As a result, in order that Sterkspruit farmers receive their Bell Park water and members from the Mtsugwana receive theirs, the opening of both dams has to be necessarily coordinated to ensure -as far as possible- the correct (yet inaccurate) distribution of rights²¹. In practice, this coordination has not proven beneficial for WIS Mtsugwana members, with Sterkspruit farmers benefiting the most. The explanation of the Sterkspruit chairman provides context for this issue: “Let’s say that I release 1000 m³/h from the Mtsugwana and some farmers from the Sterkspruit (without rights in the Mtsugwana) use this water. So what I would do then is open the Bell Park dam and pay the Mtsugwana dam members the water share that Sterkspruit users used. So that is how I have been doing it. Theoretically it works but sometimes it’s difficult. It can happen that the Sterkspruit farmers owes the WIS farmers 4000 m³ in a season” (pers. comm. Sterkspruit chairman).

In the former system, restrictions were applied to share water scarcity amongst members. As stated in the IB former by-laws and known by all farmers: During the dry season “water shall be shared per ha of scheduled land owned” (Little Thukela by-laws, no date). In the current system (post Mtsugwana Dam construction), all IB farmers interviewed maintained that:

1. Current restrictions start with the former restriction: Water is shared per ha of scheduled land owned.
2. Then when the river starts getting lower, the Mtsugwana is opened and the second restrictions -Mtsugwana dam rules- is applied: Participant farmers in the dam are allowed to pump their concrete allocations while non-participants are not allowed to pump at all.

Nevertheless, in the year 2010 when this study was undertaken, the first restriction was never applied whilst the second restriction was directly applied. This implies that in practice, *actual* restrictions mean that when the Little Thukela River is at less than 4000 m³/h, the Mtsugwana dam is opened and then: (1) all non-members are completely cut and cannot use water, (2) dam allocations start to be counted and (3) Little Thukela section 1 members can pump their allocations from Little Thukela river without the need to let water pass to downstream users (pers. comm. bailiff Little Thukela and WIS IB). This is not surprising, as “investments to

21 This challenge does not take place the whole dry season. While the Mtsugwana dam starts to be open in August, Bell Park dam is already opened by June.

create irrigation facilities always create, or rearrange property relationships with regard to those facilities” (Coward, 1983: 12).

It is also remarked that the use or dismiss of water management rules -in this case- water scarcity rules, have been transformed, changed and/or adapted in accordance to the changes introduced by the Mtsugwana dam. This confirms the *ANT* theory that states that humans and technological artefacts are interconnected and that the later can also have an influence on humans and therefore they can be described as an agency (Sayer, 1992; Latour, 1996). It is also observed that within the construction of this infrastructure, the institutional sets up, as well as, rules in practice have changed. This is in accordance to (Meinzen-Dick and Pradhan, 2002) that have shown that even if laws are contradictory, they will be used when best suited. Similarly it is observed that *legal pluralism* outcomes may be beneficial for some actors while disabling for others (Bavinck, 2005).

Finally, another practiced ‘unwritten rule’ observed for the Mtsugwana dam is the distribution of the *pool*. Just like Bell Park dam, farmers have the opportunity to sell their unused allocations to other farmers. For the year 2010, 425 ha were in the Mtsugwana pool (pers. comm. Secretary of the IBs). For those farmers that did not buy any ha from the pool, this represents the only opportunity they have to continue to have water during the most critical time of the dry season.

3.2.2. Perceptions on the changed hydraulic property

Perceptions on the new system vary greatly among the farmers in the catchment. Sterkspruit beneficiaries from the dam believe it is a good deal for the Little Thukela farmers. “First of all, they are not losing any water from evaporation as it is in our stream that water is released from the dam. And second of all, the maintenance has still to be done. More water means eventually more costs for maintenance. And we will bear that bigger share because it happens in the Sterkspruit” (pers. comm. Sterkspruit commercial farmers).

In relation to restrictions, beneficiaries from the Sterkspruit and WIS think it is just that farmers that did not contribute are not allowed to pump water. “First because they did not buy water from the dam, but most importantly because if the dam would not have been built, there will be no water in the river anyway” (pers. comm. Sterkspruit and WIS commercial farmers beneficiaries).

Farmers from Little Thukela section 1 hold two opinions: some think the dam does not benefit them because no water from that dam goes to the Little Thukela River where they get water from. Others acknowledged this fact, but think they still benefit. “I get more water because now, I don’t have to share with WIS farmers. For me the dam is like a buffer” (pers. comm. Little Thukela section 1 commercial farmers).

Finally, for those who did not contributed to the dam, the new system is unjust. According to them, now they are left with no water at the end of the dry season and the only possibility to acquire water is to wait for early rains, or buy water from the Mtsugwana dam.

3.3. Water Governance and Monitoring

In terms of governance, the Little Thukela and the WIS IBs have the biggest challenges and problems. Besides the fact that together they have a large number of members, they do not count with a major infrastructure to support their two crops a year ambitions. This has meant

that for years, at the end of the dry season, recurrent conflicts and sometimes even the ‘stealing’ of water have been some of the issues the IBs dealt with. Furthermore, these IBs do not enjoy cohesion among their members and most of the decisions are taken once a year in a general meeting. Day-to-day management and/or monitoring decisions are decided by the chairmen and sometimes consulted with board members by phone (pers. comm. commercial farmers).

Different from other IBs, the Sterkspruit IB has a system of rotation of responsibilities in which each member gets to be in the management committee at least once in his life. As a result, two new members replace every year two members in the board. Cooperation is also more usual and at times of water scarcity farmers are asked to rotate their pumps so the last three farmers in the river can also continue with their irrigation. Some members have more than one pump, so these are asked to use just one pump at a time and/or to rotate them during the week. In extreme occasions some upstream and farmers located at the middle of the river are asked to stop pumping for one or two days to allow water flow to the last farmer in the river. “We have chosen the conservative way to deal with shortages. We rather have small shortages like 2 days without pumping than pumping all and then have real problems” (pers. comm. Sterkspruit chairman).

When asked to Sterkspruit commercial farmers what made their IB more cohesive and less conflictive in comparison to the Little Thukela and WIS Boards, they answered that the Bell Park dam makes a huge difference in their relations. According to them, before the dam was constructed there was also water stealing and more conflicts between farmers in the Sterkspruit. The dam is also a reason why there are more meetings at the Sterkspruit IB because the ‘pool’ has to be determined. As a result, board members get together every 3 months to plan, distribute and sell (if that is the case) the water the Sterkspruit farmers would not be using. Again, this highlights how technological artefacts can have an influence on humans and therefore function as agency rather than just objects (Sayer, 1992).

Governance in the Lindequespruit IB is the most simple in the research area. Like the other IBs, once a year the 9 members have a meeting where financial and general decisions are taken. For the dry season, when the Lindequespruit starts to reduce its flow, the chairman opens the dam. There is no bailiff and the IB works based on trust. According to the chairman of the Lindequespruit, the dam can be full around 5 times in a normal (rainfall) year. So basically, there are no problems of water scarcity and associated competition over water among the 9 farmers (pers. comm. commercial farmers). It has to be noted that no monitoring takes place in the Lindequespruit IB.

3.3.1. Water Monitoring

Irrigation Boards have the authority to locally manage water and therefore, also to monitor it. Water monitoring is the most difficult in the Little Thukela River. First of all, there are many more members, a total of 55 (divided in two IBs) in comparison to the 20 and 9 members in the Sterkspruit and Lindequespruit respectively. In addition, as the IB does not have an IB dam as the other two IBs, water conflicts or the disrespect of rules are more prone to happen because of the stress of continuous water restrictions that undermines and risks their agricultural productions. In line with this argument, it was mentioned by the commercial farmers that before the Bell Park dam was built, Sterkspruit farmers had more conflicts and ‘stealing’ was a problem (pers. comm. Sterkspruit farmers and Sterkspruit bailiff).

In the Little Thukela and Sterkspruit, farmers have hour meters attached to their pumps. Hour meters are used to measure the quantity of hours a pump has been running. In the Little Thukela, the bailiff calculates the total amount of hours each member is allowed to pump according to its schedule. Therefore he gives everybody the total amount of hours they can pump. In the case of the Sterkspruit, the schedule is not transformed into pumping hours. Farmers know they have 5000 m³/ha they can spend from the Bell Park dam. The bailiff collects the data from the hour meters and calculates how much m³ each pump has spent for each farmer.

In the case of the Sterkspruit, the bailiff does the monitoring once a month and it takes him 2 days to measure the 25 pumps. In the case of the Little Thukela's bailiff, monitoring is done every week and it takes him the whole week to finish all the Little Thukela's pumps.

It has to be noted that bailiffs start monitoring when the dry season starts. Yet, it is sometimes difficult to define when the season truly starts. As a result, even when they start monitoring, if it rains, in the case of the Sterkspruit the bailiff would start all over again and do not count the past measurements. The reason lies in the fact that late rains add more water to the Bell Park dam but also to the rivers and therefore, the water used by commercial farmers could not be counted as Bell Park's water.

In the Little Thukela and Sterkspruit water flow is also measured at different points in the rivers: In the Little Thukela water is first measured before the first farm of the river (at the Loskop bridge), then at the middle of the river, at the WIS weir before Winterton, then at another two points in the big canal and finally at the level of the last farmer in the WIS IB. In the case of the Sterkspruit IB, water is first measured at the level of the first IB farmer, then at the middle where a weir is located, and then at the level of the last farm of the river before the Sterkspruit River joins the Little Thukela. The bailiffs do that monitoring work. In principle, Little Thukela's bailiff is in charge of the monitoring of the Mtsugwana dam while Sterkspruit's bailiff is in charge of the monitoring of Bell Park. Nevertheless, Little Thukela's bailiff does not monitor Sterkspruit member's allocations from the Mtsugwana, as the Dam committee members believe this unreasonable as this work is already done by the Sterkspruit bailiff. According to Little Thukela's bailiff, this hampers his work but he has been unable to change this constraint in his favour.

For both IBs, the disrespect of restrictions and/or formal allocations are managed in an informal way. When the bailiffs see a farmer is reaching its allocation, they will personally talk with the farmer and monitor more often this person. If there is a persistent problem or a person has not respected its schedule with previous notification or warning, then they would pass the problem to the board. In most cases, a notification is sent and then an arrangement for next season is made between the board and the farmer. Hardly ever, a notification of the user would be sent to DWA. This could probably mean other consequences for the user, like the renovation of the registered water (pers. comm. commercial farmers).

3.4. Water Strategies

As some of the collective water strategies executed by commercial farmers have been already presented in previous sections, this section mostly concentrates on individual water strategies developed by commercial farmers.

Water registration

First of all it has to be noted that when the new democratic government took power, the DWA started a national water registration of all users. With the abolition of the riparian rights, water rights are no longer attached to land ownership and therefore water does not belong anymore to commercial farmers. The only right that the NWA recognized is the Environmental Water Requirements (or Environmental Flows (EF)) also known as the Reserve in South Africa (Pollard and Du Toit, 2010).

When water registration took place in the research area in 2000, what basically happened was that commercial farmers were asked to register their water use with DWA officials before a certain date. The IBs organised themselves and approached DWA so they could help in the registration process. As a result, they lent the IBs offices to DWA officials so farmers could pass by to register their water. IBs meetings were held to explain the registration process to IB farmers, analyze the situation and share information. In the case of non-members, registration was more difficult in the sense that they were less prepared, informed and organised to face DWA officials in comparison to IB members (pers. comm. non-IBs farmers).

As shared by commercial farmers, some of them registered less water because they did not want to pay for it. The more you registered, the more you had to pay. They thought that while monitoring was not yet enforced, more water could be taken without any problem and for free. On the contrary, others registered more because they saw it as a means to ensure water for the future (pers. comm. commercial farmers). As no restrictions were given by DWA and no assessment was made on water availability in the catchment and the future requirements for emerging farmers, this gave the opportunity to commercial farmers to register their water (in some cases even more) and therefore maintain their riparian rights. “What happened was that historical riparian water rights were registered under the new act” (pers. comm. commercial farmers). So basically, this compulsory registration process stated in the NWA as a step to redress and ‘reform’ the water sector did not change anything.

The pool and diversification of water resources

According to commercial farmers there are two ways to get water: one is to register water with the DWA, and the other is to buy water from the IBs that have dams (pers. comm. commercial farmers). As explained in previous sections, the pool allows external users to a system to have access to water.

While the pool is a strategy mainly used by smaller farmers that do not have sufficient resources (private dams and or concrete rights with IBs dams) and/or farmers in expansion, wealthier farmers developed other strategies. One of the commercial farmers in the research area explains his diversification of water resources to ensure water availability for his different farms: “If the Sterkspruit is dry, I pump water from the Little Thukela. Then, if I have used all my water rights from the Bell Park Dam, I use my rights from the Mtsugwana (pers. comm. commercial farmers).

Creating new water

For commercial farmers “water is like a Bank if it’s stored.” (pers. comm. commercial farmers). As a result, the 18 interviewees are strong supporters of water supply development projects in the area. Though as stated before, most of them have at least 1 private dam, 4 of

the interviewees (located in the Little Thukela River and in tributaries) are in the process of constructing and applying for a dam permit.

It is noted that different strategies are developed to be successful and get a permit from DWA. First, the process of construction of dams starts even if the permit has not been approved. Second, a private consultancy company is hired to do all the required studies and intermediate negotiations with DWA. Third, a BEE component is added in which the farmer promises a certain percentage of the water to a community. In the case of the research area, this is the community of Kethani (just outside Winterton) as it is the only agglomeration of HDIs downstream. Kethani has been designed as an urban settlement with no agriculture plots or home gardens. Thus, water is not meant for agricultural use but for domestic and personal use that falls under the Reserve. All of the commercial farmers interviewed do not agree with the “compulsory” BEE component because they think it is the responsibility of the State to ensure water services or support emerging farmer’s water resources. Yet, they perceive they have no choice but to collaborate and they rather have to “share” their water than do not have anything at all (pers. comm. commercial farmers currently struggling to get new dam permits). As there are no communities with agricultural land available positioned downstream and/or bordering downstream (these particular) commercial farms, the real water that could or would be shared is insignificant. In the words of a DWA official, “what communities need to improve their water access is nothing compared to what farmers use for their irrigation. So we are talking about lame numbers that can be easily summed up” (pers. comm. DWA Regional Durban official).

Most of the commercial farmers think that DWA do not have the manpower to monitor water distribution. While this might be partly true as it has been noted by some authors (Merrey *et al.*, 2009) and personally explained by DWA officials in one of my visits to DWA in Durban, an example of successful monitoring in the area is worth to mention for two reasons: first, it illustrates one of the many water strategic actions that commercial farmers undertake while showing that indeed, DWA safeguards regular monitor.

In order to extend and/or ensure reliability of water, one of the 18 commercial farmers interviewed in the research area reinforced the wall of one of his dams and added 3 meters to it in order to store more water. Contrary to what he had thought, DWA did notice and just recently declared the dam illegal. However, no further action has been taken yet, and the farmer has continued to use his dam and the water stored in it (pers. comm. commercial farmers).

The use of electronic monitors²² to increase water efficiency is an investment that wealthier commercial farmers (5 of total IB interviewees distributed in the Sterkspruit, Little Thukela and WIS IBs) are starting to use. This allows them to save water while reducing electricity costs, which have “increased more than 100% in the last 4 years” (pers. comm. commercial farmers). In addition, it is noticed that Little Thukela and WIS commercial farmers are investing in flow meters to prove they do not receive their total water share. On the contrary, Sterkspruit farmers are investing in such meters to demonstrate they are taking the correct

²² Electronic monitor is a technological tool that measures air temperature and soil humidity and calculates how much water and when it should be applied to a field. As a result, farmers can have this information calculated by this artefact and some even get their information directly on their cell phones every morning. While some of the farmers fully trust on this monitors, other have started using them but have also undertaken control or manual tests by their side to prove the monitors.

water entitlement. In general, both groups are using this strategy to protect their water and prevent possible water disputes.

Chapter 4. Communal Land Reform

The present chapter analyzes two different cases of communal land reform in the Little Thukela catchment. In section 4.1 the case of communal land reform in Potshini under the label of ‘commonage’ is analyzed putting emphasis on the difficulties and problems encountered by the community and authorities and thus, challenges ahead for this type of land transfer to multiple users. In section 4.2 the case of communal land reform in Amaswazi under the policy of ‘land redistribution reform for agricultural development’ is analyzed seeking to understand how despite of resources available (land, water and technology), communities are confronted with management and organisation challenges that undermine reform expectations.

4.1. Potshini: the battle for communal land management

4.1.1. Socio-agricultural organisation in Potshini

Despite the passage of time and the different apartheid policies that impacted the social organization and way of life of black South Africans, it is interesting to find most former socio-agricultural characteristics in former homelands and communities like Potshini still existing today. Agriculture is mainly a female activity while men are the managers of the cattle. Cattle have an important meaning for the Zulus and to date, lobola (payment for marriage) is still practiced and based on cattle. Another important detail and particularly relevant to understand the organization of land in Potshini is noted by Varela (2000: 66). “Between harvests, all land was communal”. In Potshini, during the rainy season, households prepare their fields and independently cultivate relatively small areas that vary from 0.5 to 2 hectares. Nevertheless, after harvest, cattle come back from the mountains and/or from the communal grazing land area they have since 2002, to the fields. Therefore, in winter (dry season) after harvest (end of May-June) all land is treated as communal, though everybody is aware of the ownership of each plot in the community (pers. comm. Potshini rural dwellers).

It has to be noted that agricultural activities are no longer the main source of income, neither hunting nor fruit collection. The Zulu practiced these activities most probably before land became constrained and/or land was limited by the colonial and apartheid system. Today, in Potshini 45% of the households have access to remittances from family members working elsewhere (Mudhara *et al.*, in review). Still, every year, family plots are planted with maize and/or beans mainly for home consumption.

Potshini consists of 240 households in a settlement area of 5.6 km² (Besnard, 2010). The thirteen selected smallholder farmers for this research are based on the previous work of Kemerink *et al.* (2009). These rural dwellers permanently reside in the area in contrast to other residents that work outside the community either in commercial farms or in urban areas. They have different political affiliations, levels of income, educational backgrounds, belong to different households and have different types (though related) agricultural systems. Eight of them are men and five women, while seven of the total are older than 50 years old. The interviewees are located in different parts of the community as one of the objectives was to understand how land and cattle were managed in the community. Cattle and land are of interest, because it is believed that understanding agricultural practices around the management of cattle, will give a better understanding of how land is distributed, managed and co-adapted through processes of land reform.

It is clear that the small-scale agriculture practiced has as objective the nutrition or (mal-nutrition²³) of its families, being maize the base of food. Marihuana is also a considerable source of income for some families in Potshini (Kemerink *et al.* 2009). Nevertheless, home gardens are planted with a variety of different vegetables mainly during the rainy season, though some home gardens were observed during the dry season of 2010 when the research fieldwork was undertaken. It has to be noted that multiple NGOs work in Potshini with the objective of reinforcing small-scale agriculture to increase food security and/or income. As a result, the home gardens of Potshini have been particularly benefited by this intervention with rainwater harvesting tanks, though it has been observed that a network of people is particularly benefiting from the NGOs (Kwezi, 2010). Still, when visiting other communities in the area, home gardens were not easily found during the dry season.

The acquisition and distribution of land in Potshini was and still is arranged by the chief. The 13 informants interviewed in Potshini recalled that they initially got their plots from the chief. Land ownership is passed or arranged from generations through men. As a result, when asked about land ownership, all informants stated that the land belonged to the men, father or husband. Land size change is not noticed as informants stated that they have had the same plots since they were in Potshini (in one case dated since 1944). Yet, it is noticed that through generations, if new plots cannot be acquired, land is split between brothers. This entails the expansion of land use for settlement at the expense of crop land while former plots are also divided between family members reducing plot sizes (see figure 8 and 9).

It is noticed that when asked if more land is needed for agricultural production, only 2 informants said they would not want to have more as they do not have help (labour) to cultivate and expand their agricultural activities. In addition, it is noticed that only 5 (male) of the 13 interviewees in Potshini have demonstrated interest in expanding and improving their agricultural activities (they have changed their agricultural systems and now use tractors to prepare their plots, use inputs, follow a calendar, rent land from others, pay labour for different agricultural activities (planting, weeding, harvesting, etc.)). For the rest (the majority), agriculture still represents a supplementary economic activity that either improves household food consumption or supplements income.

²³ Mamdani (1996) explains the evolution of different agricultural systems in former colonies through Africa. He notices that under the system of forced labour for agricultural production, an increase in exports of industrial crops meant a drop in food production for local consumption. Therefore, famines were registered. Colonial responses to famine were to apply force to shift (this time) from export food production rich in protein and labour-intensive food crops to high-starch but low-labour ones. He concludes that: "The antidote to famine was generalized malnutrition!" (Mamdani, 1996:159). Even when forced labour has been removed from the National Constitution, the unchanged socioeconomic relations and status of rural communities, has been unable to shift eating patterns attached now, to culture and the development of local-typical food (in Zulu culture uputhu, amangila, amongst others) high in starch and low in proteins.



Figure 8. In this aerial picture of the community of Potshini, land use in 1945 is shown. Brown figures are former agricultural plots while red figures are former households. Source: Besnard (2010).

Figure 9. For exactly the same area as figure 8, in this aerial picture of the community of Potshini, land use in 2008 is shown. Brown figures are agricultural plots while red figures are households. It is observed the evolution of land use with a significant increase of number of households accompanied by a further division of plots size. Source: Besnard (2010).



The management of cattle changed in 2002, when new grazing land was given to the community by DRDLR. Though, the land was given as a group only to 77 people, to avoid possible conflicts, they decided to share their grazing land with the whole community of Potshini (pers. comm. Potshini emerging farmers). As a result, what was already from the beginning a limited resource to be shared amongst 77 people (who owned from 4 to 32 cows each) became a land transfer set up for failure. In the following section (4.1.2) it will become clear why it is argued that success had little chances with Potshini's land transfer.

Before the grazing land was given, cattle used to graze in the Nkuzi Mountain (southwest of the community) and in the upstream northern limits of the community (for more detail information see the work of Besnard, 2010). It was also normal (but counterproductive) that cattle grazed in the fields even when crops were being planted. It has to be noticed that most of Potshini's agricultural plots do not have fences, thus after harvest, cattle get into the fields to eat any maize leftovers and finish the harvest. It also shares traditional communal roots.

Since 2002, cattle are kept in the grazing land during the cropping season and they can only come back after harvest. It is worth to notice that all of the Potshini rural dwellers interviewed pointed out that cattle are allowed in the fields of the community only when harvest is finished. Yet, in practice this rule is not respected and multiple variants are present.

Four of the thirteen informants signalled that they could only start harvesting after the chief has finished his plots. Though the rest of the interviewees said they no longer need to wait for the chief or to contribute in harvesting his fields, it was noted that sanctions have happened in the past. This might include the loss of one goat or cow "depending on what the chief wants at that moment" (pers. comm. Potshini rural dwellers). As a result, it is noted that although to a lesser degree, the remains of past-enforced chieftainship's²⁴ power are still present in the community of Potshini. As pointed out by Mamdani (1996:156), "even if statutory labour was abolished (speaking of the colonial governments), the customary obligation to obey the chief was not."

Cattle drink water mainly from natural springs and the streams that pass through the community. In addition, one emerging farmer interviewed (located in the east part of the community) had built a small earthen dam in one stream to keep water for his cattle during the dry season (pers. comm. Potshini emerging farmer).

Irrigation is not a usual and well-known practice in Potshini. They develop rainfed small-scale agriculture and water for irrigation comes mainly from communal boreholes that are supposed to be used for domestic use. The boreholes are freely used, not all of them work properly and some households are located more than one kilometre from them (Kemerink *et al.*, (2009). "During winter, farmers suffer from water shortage and sometimes even for domestic use, as boreholes run dry" (Kemerink *et al.* (2009:11). As concluded by previous studies, water conflicts are present, even though conflicts may not be expressed in an explicit claim on water resource shared between users (Kwezi, 2010).

²⁴ During apartheid, local tribal leaders were appointed by the government to run the so-called independent homelands. The incorporation of traditional governance structures was a common strategy developed by colonial states to control resistance and manage the *natives* (Mamdani, 1996). The apartheid regime was no exception. In exchange of the collaboration of chiefs and their councillors, they were treated as civil servants and enjoyed paid salaries and other benefits. As a result, a ruling black elite emerged with a personal and financial interest in the preservation of the apartheid system.

Besides water scarcity and the lack of infrastructure to use water, other reasons might explain the lack of small-scale irrigation initiatives from the community:

1. *Structural and educational heritage.* First of all, it is believed that the structural and educational heritage of apartheid may be a strong cause. Most of the people living in Potshini do not necessarily identify themselves as farmers as they have always lived as labourers. Colonial and apartheid systems undermined the preparation and education of black Africans to semi-proletarianise African rural dwellers and farmers, either as labour tenants or migrant workers (Maylam, 1986). Thus, the predominance of small-scale farming as supplementary economic activity along water scarcity has prioritised the improvement of water supply services by communities and authorities. In addition, irrigation is a knowledgeable activity. As stated by Mollinga (2003: 26) “it is not unimportant to stress the knowledgeability and capability of the actors involved in large-scale canal irrigation management”. Thus, this is an activity that requires some preparation or guidance to be successfully undertaken in an organised communal way, even if is done at the level of small-scale irrigation systems.
2. *The resources condition.* Apart from this legacy, another main reason is the lack of available land to build a dam. As discussed by Kemerink *et al.* (2009) and Kwezi (2010), most of the plots in Potshini are already allocated by family and/or subdivided between more members as families grow (also see figure 7 and 8 in this section). As land is constrained for development not to say for the community’s agriculture expansion, there is no chance that any water storage (or minor dam) could be constructed to improve small-scale irrigation.
3. *Irrigation requires specific technologies and institutions.* Irrigation requires specific technologies and institutions to manage water. Variations in temperature and rainfall distribution, different soil types, diverse crops planted by different actors and within same actors result in different water requirements amongst actors, crops and growing cycles. In addition, people used water strategically, adapt, and contest irrigation activities and water distribution. Thus, developed systems of water management have to be devolved amongst communities and community members to both, technically and institutionally, manage water (Mollinga, 2003).
4. *Commercial agriculture: governmental priority.* On the broader political-economic scale, the Land Redistribution for Agricultural Development (LRAD) program with the explicit aim of promoting commercially-oriented agriculture has replaced former focus on family-based groups since 2001 (Lahiff, 2003, Hall, 2004). A shift in policy towards a more private-entrepreneurial model of farming has also been enhanced with LRAD. Thus, the promotion and investment on small-scale irrigation to support emerging farmers and rural dwellers that engage in agricultural activities as a supplementary food security and/or income strategy, are not high priority in the agenda of current land reform programs. In consequence, the governmental support to acquire land to then put in place infrastructures to improve access to water for small-scale irrigation is perceived as unachievable without this crucial external support.

4.1.2. Land reform in Potshini

According to previous studies, DRDLR bought the land (approximately 600 ha) from a commercial farmer and transferred it to the community in 2002 (Kwezi, 2010). In line with land beneficiaries statements, they acquired this land thanks to a land restitution claim they lodged with DRDLR in 1998. Under the new Land Rights Act (act no 22.) black or colour South Africans that suffered from ‘unlawful dispossession’ could lodge a land restitution

claim to get compensation from past discriminatory policies. As a result, some members from the community of Potshini made use of this law as a resource to strengthen their access to land resources.

Originally, they claim property rights as a whole group (the community). Once the claim was finally processed and DRDLR started looking for land for restitution, they contacted the community and asked them to reduce the quantity of numbers of beneficiaries in a separate claim (pers. comm. grazing land beneficiaries). According to one of the leaders of the grazing land committee, they were asked for specifically 77 members and so they organised themselves and a selection of members was done. When asked to DRDLR officials why not the community as a whole and why the number of 77 was given, they answered that they could not redistribute a lot of land at once for the whole community; As the opportunity to buy one farm was available, they tried to reduce the number of the first beneficiaries from the grouped restitution case (pers. comm. DRDLR official Ladysmith office). Not surprisingly, the outcome of the selection was and still is a highly contested issue among non-beneficiaries that integrate the community.

During the fieldwork of this study, it was found that this area was denominated as *commonage*. Commonage or public land is a 'land reform' term used to refer to former municipal public land that has been transferred to a community. The post-apartheid government has emphasized the use and reallocation of municipal commonage for food security and poverty alleviation projects in key national policy documents, such as: the White paper on agriculture (South African government, 1995), White paper of land policy (DLA, 1997) and the White paper on spatial policy and land use management (2001). These policy documents have supported the reallocation of vacant municipal commonage for poverty alleviation and food security purposes (Atkinson, 2005). Though it appears that this has not been the case in Potshini as the land was bought from a commercial farmer, the land is referred to and managed as commonage. It means that beneficiaries are treated as a group and get land allocated to them as a group. Property rights are not only allocated as a group, but as they are in commonage, land is given in custodian to the municipality (who keeps deeds) with the 77 households as beneficiaries of the land.

In addition, two other variants were found in the case of Potshini. Under the CLRA it is required that along with the transfer of state land to a community, management has to be devolved to a local authority through 'land administration committees' (usually represented by TAs) (Cousins, 2007). Though in Potshini a land committee was established when the land was transferred as required by CLRA, it is noted that 'officially', land management is the Okhahlamba (local) municipality's responsibility. The reason lies in the fact that the title deeds are not in the name of the beneficiaries, but in the name of this local state entity. Moreover, the land or grazing land committee pays a symbolic annual fee for the land (ZAR: 10; €1) (pers. comm. grazing land committee members and regional DRDLR official at Ladysmith). Thus, it is the beneficiaries' understanding that the land is in lease to the municipality. According to DRDLR officials, this does not mean that land transfer has not happened, as it appears that the title deeds are conditioned to a role of state *land guardians*. In conclusion, land has been in practice been reallocated to 77 beneficiaries who do not have the title deeds in their names and have a local administration committee that answers to the municipality. In short: the land transfer implementation process with its multiple variations and insufficient follow up by governmental officials has created a general environment of confusion. This confirms that the existence and terms of user-rights (group or individual) of

commonage in former homeland are not clear as signalled by Thornton (2009) for a case of urban commonage.

Though DRDLR officials from Ladysmith office think these variations have been implemented for the sake of sustainable land management, in practice the local municipality has not fulfilled its role of land guardian. On the contrary, it has been DA officials who have been giving support and advice to the community. Still, institutional capacity to advise and support rights-holders is limited and systems of land administration at local levels by the state are not in function (Okhahlamba municipality has been recently closed and the mayor fired for corruption (pers. comm. Commercial farmers, Potshini and Amaswazi community members and DA officials). In addition, it was observed that an effective communication on land rights and legal reforms from DRDLR officials to beneficiaries was not met, as they do not manage the adequate information to defend their rights and manage the land. This has been undermined by the ambiguous rights they hold, without title deeds and at the expense of municipality's willingness to renovate the land lease. Thus, the conditions required for effective implementation as described by Cousins (1997) have not been met²⁵. Insecurity and confusion over communal land demonstrates a critical need for effective implementation of this type of rights-reform.

According to formal procedures, beneficiaries have to register their rules in the form of a written constitution before receiving a 'Deed of Communal Land Rights'. Upon the TA acceptance, land can be transferred to the beneficiaries (Communal Property Association Act, no 28, 1996). The act enables members of disadvantaged communities (HDI) to collectively acquire, hold and manage property in terms of a written constitution. It is basically a recognition of informal communal systems through which many rural black people hold land. The Communal Property Association (CPA) model is a new form of legal entity that allows groups, democratically constituted in terms of a written constitution, to acquire property collectively (Lahiff, 2003). However, it is seen that even though the community of Potshini followed this procedure they were not given this legal entity and on the contrary, the land is on commonage. Nevertheless, during key informant interviews with community leaders and grazing land committee members from Potshini, interviewees stated that beneficiaries had several meetings with DRDLR and beneficiaries meetings to discuss and write the management rules of the grazing area. Despite of the Constitution, which was written by the community, in practice, beneficiaries received the land but the deed was transferred to the municipality.

After land was transferred, the 77 beneficiaries decided to share the grazing area with the whole community of Potshini to prevent possible conflicts. It is thus seen that defining the boundaries of communities, and who should be included or excluded as beneficiaries of land reform programmes, is highly problematic. "Who is included or excluded in 'group' forms of tenure? Who gains land rights in the redistribution of state land? How are the benefits from restitution claims by large and poorly defined groups (rather than individuals or clearly defined groups) to be distributed? How do power imbalances within 'communities' affect land

²⁵ Cousins (1997) established that in order to have effective implementation of land reform, four conditions were required for its success. First, adequate information and effective communication of rights and laws had to be taught and transferred to the beneficiaries. Second, institutional capacity to advise and support right holders was necessary to facilitate active use of the law. Third, an accessible and efficient system to record and register rights was necessary to prevent disputes. Thus conflict resolution systems or access to courts had to be ensured. Finally, it was fundamental an integrated and functional system of land administration at different levels of government.

rights? The answers to these questions largely depend on which notion of community is held by the implementers of land reform (in most cases, government officials). While their position of power provides them with a greater say in which definition of community will prevail, locally held notions seem to be crucial to the answer” (Kepe, 1999: 418). As generally stated by Kepe (1999), in this case study ‘locally held notions’ of what is equitable and just, prevail in the face of formal commands and organising efforts of the State.

Ironically, after the decision to share the land with the whole community was taken, different conflicts arose around management decisions and rules. Specifically, a disagreement arose around the partition of the area. According to the Constitution, land had to be divided in plots and cattle had to rotate from plot to plot during the year to allow a better control of the grazing area and management of the pastures. Community (traditional) leaders and some beneficiaries decided this was not right as land had to be managed communally, like the rest of the land in Potshini community (pers. comm. grazing land committee members). This outcome can be analyzed as a lack of differentiation between what it is communal tribal land and communal redistribution area along with misinterpretation or lack of information of former rules that contributed to a consequent rupture of the Constitution.

Nevertheless, it is also a clear example on how State top-down laws (formal or normative laws) are re-interpreted, adapted and circumvented in Potshini community. *Customary law* has been chosen above many efforts from State departments to control and manage the land transfer with its imposed laws. DRDLR tried without success to first, select beneficiaries (from a whole where everybody feels has a right) and second, to direct and conduct the process of writing of rules in a form of Constitution that was not sufficiently consulted and understood among members (not to say by the whole community). These ‘commands’ are here seen as formal-official laws. In contrast, they are contested by community leaders, especially by traditional authorities and non-beneficiaries of the grazing land, that as a whole, have greater *agency* to change formal laws in accordance to customary traditions that protect their own interests. In consequence, it is appreciated that in a context of plural legal orders and institutions (State departments, traditional leaders, land (grazing) land committees; formal laws vs. customary (traditional) law)) in the case of Potshini community, formal law and institutions are contested and fail their appointed objectives and responsibilities. This is in line with similar findings elsewhere in rural South Africa (Ntshona and Lahiff, 2003). Customary law is used to protect traditional authorities interests and the interests of the whole community (specifically non-beneficiaries) at the expense of other concerns like sustainability and land quality that aggravate management and may prompt conflicts.

The rupture with formal laws has been accompanied by subsequent disagreements (circumventions) between community leaders, grazing land committee members and the community. As a result, the land committee in charge of managing the land has a general lack of legitimacy and has not been able to fulfil its function. In consequence, today, the grazing land committee is under pressure by external local authorities (DRDLR and DA) that are trying to reinforce some rules to prevent future land degradation in the grazing area. In addition, appointed members from the grazing land committee seem to not know how to be heard and respected by the community and thus, become an authority (pers. comm. grazing land committee members). While some members from the community of Potshini (and even people that do not belong to the community) continue to use this area and do not respect rules (pers. comm. Potshini emerging farmers).

It is clear that Potshini's land transfer is experiencing management and institutional challenges that the community and its appointees feel unable to solve. Different reasons explain this. First of all, Potshini's case is not surprising as other case studied provide evidence that devolving communal land rights to local actors have been highly problematic and complex due to historical adaptations of land tenure regimes in South Africa (Cousins, 2007). Thus, the decision of making the grazing land accessible to all the community is taken. Along this, a lack of differentiation between the grazing area and the community rights is undermined along appointed authorities to the new area by interested actors that use customary laws to defend their interests. This contradicts the minimum definition of common property, which defines who is allowed access to resources, who is excluded and membership rules (Lawry, 1990). In addition, if management regimes are to function effectively, agreement on rules for resource use is required (Ostrom, 1990). This is aggravated by the fact that land is simply too small even for 77 beneficiaries. According to other commercial farmers in the area, carrying capacity of Potshini's grazing land cannot take more than 300 cows²⁶. Finally, the incongruence between different institutions for resource management (DRDLR, DA, Okhahlamba municipality) and other institutions at local level (grazing land committee, community chief and its headmen, other community leaders, etc.) creates a strong and often contradictory institutional and legal pluralism environment that confuses uninformed users at local level, resulting in conflictive resource use and in the case of Potshini, an almost inexistent resource organisation and management.

²⁶ This information was collected while attending a Forum (meeting) between DA officials, grazing committee members, beneficiaries and Potshini community members. At that meeting, DA officials wanted to convince the community to seek for common solutions and rules to prevent future land degradation. Despite of this and other meetings and some accord made, the position of the grazing land committee has not changed to date. It is still undermined by other community actors and resource management is not being met.

4.2. Back to the land: institutional challenges in Amaswazi community

Table 2. A quick look at Amaswazi

Province	KwaZulu-Natal
District Municipality	uThukela District Municipality
Local Municipality	Okhahlamba Local Municipality
Type of legal entity	First farm: Communal Property Association (CPA) Second farm: Trust (Smahla Land Trust)
Households/# of claimants	Initial claimant group consisted of 183 families that are formal beneficiaries of the first settlement farm (1998). New members have since joined and for the second farm acquired, 200 households were benefited. Yet, not all Amaswazi members have been included to date.
Property location and description	The restored land is located in the uThukela District of KwaZulu-Natal approximately 22 km southeast Winterton.
Date of settlement	The community was settled in the first farm in 1998. The second land transfer took place on September 2008.
Hectares awarded	400 ha in the second farm.
Current land uses	<p>In the first farm the principal land use is for settlement though households also have small plots and there is also a grazing area (or free land). In addition, there are:</p> <ul style="list-style-type: none"> - Primary school. - Tribal Court. <p>In the second farm the main activity being undertaken is <i>livestock farming</i>. In addition there are:</p> <ul style="list-style-type: none"> - Citrus maintenance and recollection for local markets. - Harvest of timber. <p>It is noted that the previous owner installed citrus and timber plantations and the current administration has not managed it but just harvests it. In addition, other agricultural attempts (soya in 2008 and cabbage in 2010) have failed.</p>
Total cost of grants and settlement	<p>Data for the first farm is not available. For the second farm the following grants and financial assistance were provided:</p> <ul style="list-style-type: none"> - Acquisition of farm (ZAR): 13,500,000 - Development Capital (ZAR): 7,500,000 - Total (ZAR): 21,000,000

Source: Data comes from interviews with different actors during the fieldwork.

Research in Amaswazi was not foreseen before arriving in the research area in South Africa. The community has been scarcely researched and NGOs intervention has been limited so far. While doing research with commercial farmers in the catchment, I noticed that all commercial farmers used Amaswazi's land and water reform example to support their discourses. As this case has visually lacked success, the white community of Winterton and commercial farmers use it to demonstrate that taking land and water away from them has not lead to locally successful stories where farms are no longer being used to "put bread on the table for all South Africans" (pers. comm. commercial farmers). Thus, it seemed quite relevant to focus a part of this thesis in the analysis of this reform case. In the following section, I try to reconstruct the land and water reform case of the community of Amaswazi. To do so, first a brief history is presented to understand their struggle for land and water resources in section 4.2.1. This section's primary information was obtained through different interviews with members from the community and has been cross-checked with anthropological and/or historical studies of Natal. Then, the processes and constraints of the land and water reform are presented in 4.2.2 followed by the analysis of the different institutions and institutional arrangements in section 4.2.3

Information was collected from different interviews with a total of seventeen informants. Sixteen inhabitants from the community were interviewed and the former owner of the second farm (the community has acquired) was also interviewed to understand the process of acquisition of his farm and the negotiations with DRDLR. From the sixteen members, one is the chief of the community, 2 are members of the chief's counselling group and 2 are members of a newly established 'land trust' to manage the second farm. The rest, are permanent residents of the community that work around the area as labour in farms, for the government or for NGOs. Though all part of the same community, the actors starkly differ in levels of education and income, being the younger informants (age: 25-mid 30s) more educated. Eight of them are men and eight of them are women, while only seven are older than 50 years old. Informants are located in different parts of the community, being 3 actors located in the chief's neighbourhood, 5 in the centre part of the community where most of the original beneficiaries of the community live, 4 in the farthest part of the community and 2 that leave outside the community, but that are part of the 'tribe'.

4.2.1. Amaswazi's history

According to the chief and three elders interviewed in Amaswazi, the tribe comes originally from Swaziland. It appears they come from the Swazi (or Siswati or Si-swait) group that also formed the Nguni speaking people. Though this is not widely accepted by members of the community as they have been mixed with Zulus, I did encounter Amaswazi's inhabitants that directly told me: "I am not Zulu, I am a Swazi" (pers. comm. elder from the community). Thus, it is believed that at the origin, some families emigrated from Swaziland into South Africa.

It is difficult to determine when the Amaswazis emigrated from Swaziland as no one from the interviewees could assert on a close date or did not remember. Doing so would have meant going back to their ancient memories and plunged into the days of Shaka, 200 years ago. Yet, after apartheid the Amaswazis lodged a claim in which they had to undertake the quest to prove they were first displaced from the land they own now.

According to historical studies in Natal (today the province of KwaZulu-Natal), aggression from Zululand during the Mfecane period of King Shaka had a dispersive effect on retreating tribes (Wright, 1971). In consequence, migrations from uprooted clans and families through

the territory characterised the period. “The word Lifacane in Sesotho (Mfecane in Zulu) is of Stebele origin, and denotes a state of migration” (Ellenberger (1912:117). According to Delius (1983), the political turmoil experience in this period altered the geography of many societies in South Africa. Zulu aggression had resulted in the displacement of the AmaHlubis from Zululand. The AmaHlubis once stayed near Swaziland and are closely associated with the Amaswazis (Hadebe, 1992). According to Wright (1971), the AmaHlubis and other weaker clans and tribes were forced to settle in the foothills of the Drakensberg where the colonial government in Natal hoped that they would form a buffer between the San (Bushmen) and the colonists. This set the stage for inter-tribal conflicts.

Many groups including the AmaHlubi resisted settlement in the Drakensberg for which they were sanctioned by the colonial government. According to the work of Brookes and Webb (1965), the AmaHlubis resisted settlement and their leader Langalibalele had tense relationships with the colonial administration to the point that the tribe was outlaw, land and cattle were confiscated and Langalibalele was imprisoned. In consequence, the episode also resulted in the landlessness of the AmaHlubi and Amaswazi tribes.

The Amaswazi became known as the landless tribe because of the subsequent migrations and forced removals and settlements practiced by the colonial and apartheid government (see Box 1). They lived in an insecure situation for many years till the Wagtenbeejeis Kop Farm where some of the tribe members worked and used as refugee was acquired by the DLA in 1998. This farm, also denominated as the settlement area occupies an area of 5 km² where households also have individual agricultural plots and pasture communal areas. In 2008, another farm -Arthur Seat farm- was bought by DRDLR (previously DLA) and transferred to the Amaswazis. However, this second farm was strictly conditioned for commercial agriculture purposes and no human settlement is allowed. The farm counts with a total area of 400 ha and a scheduled water registration of 100 ha. It also has 2 private dams, 2 pumps and 2 pivots from which water for irrigation could be used (pers. comm. manager of the farm). Water is taken from the Bhudlu stream, a tributary of the Sterkspruit. Thus, former and current owners (now the Amaswazi community) do not belong to the Sterkspruit IB.

Box 2. Detail migrations of the Amaswazi tribe

According to historical interviews held in the community of Amaswazi, the tribe lived first in an area commonly named as 'Carfagai', near the Bell Park dam. They lived there for more than 20 years and then, they were relocated in the highly dense homeland of Emmaus, also known as the Amangwane traditional area in 1982 (pers. comm. Amaswazi chief and elders).

While there, chieftainships problems erupted to a war that the Amaswazis lost. According to oral accounts from the Amaswazi, they were asked to unite to the tribe of the Amangwane and thus, be under their chieftom. As they refused, a struggle for land started as the Amaswazi wanted to stay on the land but without having to surrender to the Amangwane chief's power (pers. com. Amaswazi inhabitants). According to anthropologist Mahmood Mamdani (1996), these tribal conflicts can be explained by the colonial construct that the power to allocate use rights in the land belonged to chiefs. Under this principle, the apartheid government identified communities with tribes and determined that all migrants not belonging to the tribe were strangers without a traditional right of access to land. Not surprisingly, Mamdani (1996) concludes, "in such a context, to identify community with tribe was to sow the seeds of much tension" (Mamdani, 1996:140).

When the Amaswazis lost against the Amangwane, survivors moved again to the area around Carfagai and they temporarily stayed at Wagtenbeejeis Kop farm where some tribe members worked. Once again, the apartheid state removed them in 1986. This time they were placed in an area called Rosedale, where the Amangwe (different from Amangwane) lived. The Amangwe thought they were there for a temporary period, but as the Amaswazi started to settle, this tribe also expelled them. Thus, they came back, again, to the Carfagai area and most of them lived at Wagtenbeejeis Kop farm, others lived with some tribe members that were working and living on commercial farms. As explained by Amaswazis: "As we were landless at that time, the best shot any family had was to live with any commercial farmer" (pers. comm. Amaswazi inhabitants).

The commercial farmer from Wagtenbeejeis Kop farm allowed them to stay temporarily. Yet, what was supposed to be for a while became 2 years. Finally, this farm was bought by the DLA in 1997 and the Amaswazi community was finally established legally on the land in 1998.

Source: Information from this box was collected through in-depth interviews with Amaswazi inhabitants. The chief and elders were important sources of information, but it is important to highlight that the 17 interviewees confirmed this information.

4.2.2. Land and water transfer for the Amaswazis

The primary focus of land reform has been the redistribution of land through a market-led 'willing buying, willing seller' land redistribution program. From 1995 to 1999, the governmental approach targeted poor households and made available Settlement/Land Acquisition Grants (SLAG) to purchase land. The model was widely criticised for the complex group dynamics that resulted, because it did not link acquisition of land to support and other resources to enable the generation of livelihoods off it, and because it reproduced overcrowding which brought *betterment* memories that contradicted the rural restructuring envisaged by the government (DLA, 1997). In response to these critics, the DLA (or as newly named DRDLR) took a new policy direction in 2000, and launched the Land Redistribution

for Agricultural Development (LRAD) programme that aimed at establishing a class of black commercial farmers (Lahiff, 2003; Hall, 2004).

The Amaswazis have been benefited and shaped by both policies. They gained a first restitution case and land was transferred in their favour in 1998. Under the first model (or approach) of the DLA, the area was destined for the tribe's settlement. Later, in 2008, the tribe received land and water rights along the lines of the LRAD programme and thus, resources were conditioned for commercial farming (pers. comm. Chairperson of the Smahla Land Trust, other Trust members and DRDLR official at Ladysmith). It meant the transfer of a farm in white hands to continue with commercial agriculture production, but now owned by HDIs, in this case the community of Amaswazi.

It is remarked that the claimant community (Amaswazi) is not homogenous. Many pursue multiple livelihoods strategies. They are made up of farm workers, those previously defined as labour tenants, shopkeepers, school teachers, NGO workers, other that work in non-agricultural activities and the unemployed youth and elderly. As presented before, many are retired and/or receive state pensions or remittances from family members that work elsewhere. Yet, it is observed that the terms of settlement of the second claim stipulate that the land awarded is subject on the operations of commercial agriculture. This arrangement precluded other discussions regarding alternative use or the wider needs of the community (c.f. Tilley and Lahiff, 2007).

The Amaswazis claimed land through a land restitution claim like the community of Potshini did under the Land Rights Act 22, 1998. The claim was lodged on December 30th, 1998. Like many previously disadvantaged South Africans, they used law as a resource to strengthen their agency to acquire land and water resources. Property rights in this case include water rights, as land claims are not only about land, but have also been recognized as a tool to obtain other rights, like water (pers. comm. Chief of Amaswazi). They claimed property rights as the Amaswazi tribe. As a result, land and water has been allocated to them as a group and hence property rights are also grouped. In the following pages, the two land transfers are explained and discussed.

The Settlement area

In the settlement area, a total of 183 families were formally benefited with the restitution case. A Settlement Agreement and a Deed of Communal Land Rights was signed in 1997 by the Regional Land Claims Commission of the KwaZulu-Natal province and the claimants represented by the chairperson of the Communal Property Association (CPA). The latter was established in line with the Communal Property Association Act, no 28, 1996. Nevertheless, "since the community is under the tribal authority, the (Amaswazi) chief had to agree on the transfer of land to the beneficiaries" (Chairperson of the Smahla Land Trust).

In accordance to the Settlement Agreement, a settlement plan was put in place where division of plots and allocation of families' plots was planned. The CPA (or as called by Amaswazi inhabitants 'the committee') was organized with the participation of community members to coordinate the allocation of plots and distribute funds that DLA have given to the families in addition to the land. This effort to include a 'democratic' institution to administer land was introduced by DLA and worked for some time. Yet, for the community, the 'land belongs to the chief' (pers. comm. Amaswazi inhabitants). All informants recalled that it was with the chief with whom they talked to have their piece of land. In an informal meeting with the chief the allocation of plots to a family were decided. Thus, the settlement plan was not followed.

For the inhabitants of the community, it was through the chief (as they had to contact him and upon his approval they could then settled in the land) that they have the land in which they lived (pers. comm. Amaswazi Inhabitants). Thus, though *formal* ownership and management is placed on the CPA, in practice the TA has the ultimate say about land allocation and management within this area (first farm).

It has to be noted that though traditional feelings regarding the tribal authority are very present in Amaswazi, formally the 183 families that benefited from the claim are no longer under the jurisdiction of the TA (DLA has a list of the official beneficiaries). Still, as the chief has been selling plots to other non-beneficiaries, these families fall under his jurisdiction as the chief has directly granted them the entity and rights of beneficiaries and not the DLA. This practice has enhanced his authority in the restituted area and as expressed by all actors interviewed ‘the chief is the chief in the first farm’ (pers. comm. Amaswazi inhabitants). This means that predominantly is the TA that holds the rights of the communal area and that decides who can use a particular piece of land and who can withdraw water resources. While some individuals have dared to contest this authority with the restitution of the second farm, Amaswazis feel they are part of a community (to a lesser extent to a tribe) that has a rich history of dispossession and struggle for resources as a group. Thus, the general understanding is that land (and water) is a group struggle.

It is remarked that Amaswazi’s chiefs are regarded as the leader that negotiated with the government so the tribe could finally have their own land. As such, his authority is strong and directly linked to a sense of communitarian gratitude towards him. In addition, Amaswazi’s chief is exempt from any criticism of having negotiated power with apartheid government, as the previous government outlawed the tribe.

The second farm

Though the South African Constitution clearly states cooperative government with the TA (Van Kessel and Oomen, 1997), in general, government is undertaking reform processes to establish democratic institutions at all levels that are seen as frontal attacks on the TA (Cousins, 1997; Williams, 2004). The land tenure reform program, which may take away the exclusion rights from the TA, is a clear example that seeks to undermine tribal power. Though the TA may still have considerable agency and power over the communities they managed, communities’ members are questioning their agency as the enforcement of reform by the government advances. DRDLR interventions in Amaswazi demonstrate the state’s serious intentions to diminish chief’s agency. A good example of this is the introduction and establishment of a second institution (the first was the land committee of the settlement area or CPA) wherein community representatives -Trustees- are in charge of the management of Amaswazi’s second farm and organised in the Smahla Land Trust (SLT).

The SLT is the legal entity that holds ownership rights of the second farm acquired by the community. As required by law (Communal Property Association Act, no 28, 1996), the 200 beneficiaries from this land transfer have to democratically elect members from the community to represent them in a legal entity in terms of a written constitution. “At the Community meeting held on the 8th of March, 2008 on the farm to be acquired, it was agreed that a Trust should be established and registered to receive transfer of the property and to hold it for and on behalf of the Members” (Smahla Land Trust Constitution, date unknown: 1). Accordingly, it is important to highlight that rights are granted to the SLT and not to individuals.

In this written constitution, three main features are emphasized:

1. Development, management and/or improvement of the property is subject to the terms and conditions of the Trust Deed and the Land Reform Settlement Agreement. The main condition of both legal documents is on *land use*, which is destined for the development of commercial agriculture. Thus, while the land may have been given back to the claimants, individual claimants are not allowed to access the land, withdraw water, make improvements, use resources for personal use and or lease part of the land, without the permission from the SLT.
2. The SLT by itself is not allowed to decide in the favour of personal claims from the second farm, as it is obliged to follow the rules from the Constitution and Business Plan that DRDLR handed in to them. This corresponds to clause 5, *principle of equity*.
3. The *surplus* cash resources of the Trust have to be *reinvested* in the property, in the promotion of its activities or with any financial institution. In consequence, no direct or indirect transfers of capital have to be made to Trustees or other members of the community “by way of profit, distribution, remuneration, or otherwise howsoever” (Smahla Land Trust Constitution, date unknown: 32).

Even though, these focal points appeared to be communicated to the community in several meetings, two community members (out of sixteen) interviewed and the Amaswazi TA believe some members from the SLT are trying to grant themselves individual rights to the property and its resources (pers. comm. Chief of Amaswazi). On the contrary, Trustees and four community members (out of sixteen interviewed) strongly believe that the chief is trying to expand his authority to the second farm and thus, is creating problems and frontal opposition to the SLT. Effectively, the TA refuses to recognize the Constitution of SLT and the Business Plan (see annex 7). In addition, it believes (or wants to believe) that the Trust has created those rules and refuses to recognize not only their authority, but also the rules established (the Constitution).

Currently, the authority of the SLT is contested by the TA. In theory, antagonism is supposed not to be present between both institutions as their authorities are limited to different areas, yet the TA has felt his authority undermined by the SLT.

Though not democratically elected like the nine trustees that integrate the SLT, the chief used to form part of the Trust. His adjunction is explained by the SLT chairperson “since the community is under the tribal authority, the chief was added to the Trust. We made an agreement to sit down with the TA to solve problems together” (pers. com. Smahla Land Trust Chairperson). It was anticipated that decisions were to be taken through consensus and equal participation of all members. Yet, the TA’s expectations to direct decision-making were soon confronted by other SLT members who did not allow the chief and its councillors to take decisions because ‘the chief said so’. The Trust, with advice of DRDLR, has stayed firm in trying to respect the SLT Constitution and Business Plan. This entails that the property has tried (though not successfully) to continue with commercial agriculture and it has not allowed personal ambitions (particularly from the chief) to profit from this land and/or sell plots for settlement and/or lease land. In brief, the Trust has not allowed the disrespect of the three main points of the Constitution signalled above: *conditioned land use, principle of equity and the management of surpluses*.

In consequence, the chief and its councillors have recently left the SLT and are openly confronting the authority of the SLT. Fortunately, the SLT has been backed by DRDLR and on paper (formally) has been granted significant property rights. Nonetheless, it is noted that

this ‘all or nothing’ arrangement introduced in a top-down manner by DRDLR has meant that the community and the TA have little room to manoeuvre or to access land for other purposes. Thus, other opportunities may be lost by this imposition that has been taken without consideration to community and members profile, skills and level of expertise of the community and other interests (c.f. Tilley and Lahiff, 2007).

In an interview with the chief, he constantly kept saying that the problem was the Constitution, that the rules were not correct and that he had been ignored in the decision-making process because the Trust informed him only after the decisions were taken. Yet, when asked what exactly is written in the Constitution that he did not agree with, he could not state what were the points of disagreement. His anger focused on the way things were done (e.g. lack of communication between the Trust and the TA, concentration of power and decisions by the SLT) and thus, he felt his authority disrespected and challenged by the Trust. As summarized by DRDLR officials, the problem with the second farm is that “*amakhosi*²⁷ wants to be amakhosi in the second farm and that is simply not possible” (pers. comm. DRDLR Ladysmith (regional) official).

4.2.3. Land institutional organisations

Different institutions with competitive powers had been established in the community of Amaswazi. This pluralistic institutional environment is generating the contestation of different authorities and in the process, reform rules are being adapted and/or outperformed.

It is important to understand the distinctions between these institutions. According to Leach *et al.*, (1997), formal institutions are backed by the law, implying enforcement of rules by the State while informal institutions are upheld by mutual agreement or by relations of power and/or authority, and rules are thus enforced endogenously. In this study case, the TA is clearly the informal institution trying to contest institutional reform whilst the SLT acts as a decentralised formal institution put in place by the State, backed by law and implementing rules that at the origin have been designed by the DRDLR. It is important to remark that when the SLT was established, the TA was ‘unofficially’ added to the SLT creating a mix-hybrid institution with customary and formal representatives (c.f. Cousins, 1997). At the beginning, both the SLT and the TA had good relationships that soon started to deteriorate as the management and internal negotiations of decision-making negotiations did not favour the TA’s positions.

While TA has positioned itself as the management authority in the first farm, in the second farm two main institutions are currently ‘battling’ for institutional supremacy to manage the resources acquired. On one side, the TA represented by the chief and its councillors and on the other, the Smahla Land Trust (SLT) of Amaswazi. In addition, the SLT had a mentor that acted as manager the last two years, and thus, his role is also discussed in this section.

The Tribal Authority

The Amaswazi TA forms part of the traditional Zulu governance system. The TA is integrated by the chief, the Inziduna (secretary of the chief) and the chief councillors. The Amaswazi TA has been an important institution in the negotiations of land and water reform. For this reason, and based on the traditional customs and laws, the TA in Amaswazi holds strong power in the community. Differing from other TAs, in Amaswazi the traditional structure is simpler; usually, a TA is formed by a chief who is advised by the Indlunkulu (an

²⁷ Amakhosi means chief in Zulu.

elderly man who serves as advisor to the chief) and an Inziduna. After this level, chief councillors or local representatives of the chief at village level come and finally, local traditional leaders elected by the men in the communities are at the bottom of the traditional authority. In Amaswazi, the TA is formed only by this community. As a result, there are no local traditional leaders. Thus, only the chief, the Inziduna, the Indlunkulu and chief councillors form the TA.

However, in the efforts to make the traditional governance structure more democratic, elected leaders at ward level²⁸ and elected councillors have been introduced in the traditional council (Republic of South Africa, 2003). Contrary to other findings about relationships between the TA and ward councillors (Williams, 2004), in Amaswazi, the ward councillor and the TA have good relationships. However, the relationships between both were not studied in this thesis as the main focus was to understand the relationships between the TA and the SLT.

The SLT

The SLT was introduced at the end of 2008 when the farm was transferred to the community. Nine members were elected in a community meeting that lasted for 4 hours on March 8th, 2008. Only the chairman of the SLT was directly appointed by the community. The rest of the roles (vice-chairperson, treasurer, secretary, vice-secretary and manager) were selected amongst the chosen members by the community.

The Trustees or SLT members have different backgrounds that together seem representative of the community. Both the chairperson and vice-chairperson are educated community members that outstand for their better-paid jobs and education. Other members like for example the treasurer has limited education and works as temporary labour in farms when she has the opportunity. In addition, three members are part of the chief's councillors or are directed related to him. Moreover, the chief acted as the 10th member of the SLT till recently, though is not officially included in the documents of DRDLR of the farm (Smahla Land Trust Constitution, 2008).

The mentor

One external actor that does not work anymore in collaboration with the SLT is the mentor. This person acted as the 'Management Company' that had to deal with the operationalization of the farm and day-to-day management activities. It is noted that the "mentor" was introduced by DRDLR. Originally from New Zealand, he appeared to be working for DRDLR in multiple land transfer farms to support communities. Thus, SLT members complained that he was at the farm once or twice a week and when not at work, it was impossible to reach him as it appears he was working all over KwaZulu-Natal region 'mentoring' LRRAD cases. Besides from this and the management problems resulted from his absence, the SLT members perceived he was not transferring his knowledge to them. Instead, they developed a relying attitude towards him and expected everything to be fixed by an absent mentor. This undermined production outcomes and for the past two years, agriculture efforts failed. Thus, this person was fired in April 2010 and to date a replacement has not been found to undertake his job.

²⁸ A ward is a governance division based on communities and geographical position. Under the Okhahlamba governmental structure there is a total of 13 wards. However, division of wards under the traditional structure are not compatible with the wards demarcated by the government.

Institutional arrangements

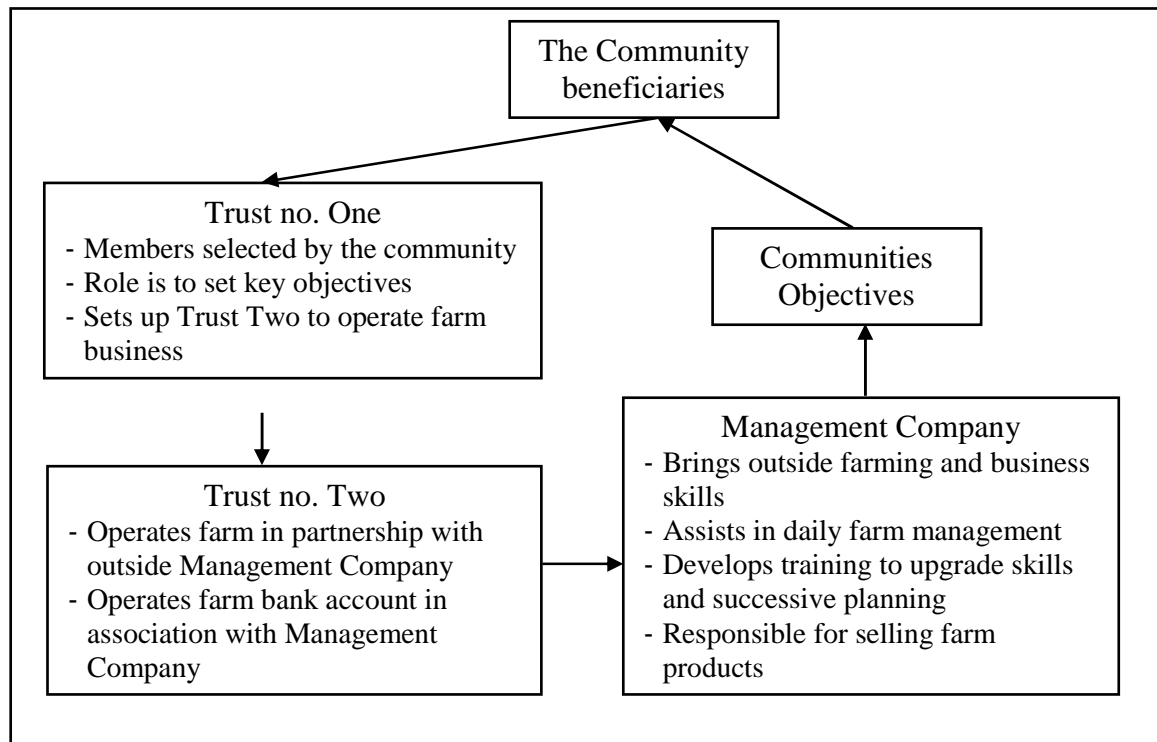


Figure 10. Formal institutional arrangements for the management of the second farm (Arthur Seat Farm). Source: Adapted from the Smahla Land Trust (SLT) Constitution.

As it is observed in figures 10 and 11, formal and customary institutional arrangements contradict each other in one crucial subject: the role of the chief. In figure 10, is appreciated that the chief is not taken into account and has no role nor is even mention in any official documents (Constitution, Business Plan, Land Reform Settlement Agreement, Trust Deed) of this land transfer. In an attempt to avoid conflicts and as a recognition of the TA's authority, the Trust decided to adjunct him. Yet, though both formal (democratically elected) members and customary (traditional) ones integrated the resulted hybrid institution, institutional arrangements and decisions over the resources follow an already established guideline (Constitution, Business Plan, etc.) that the Trustees perceived they have to pursue. Though TA contested formal arrangements and different adaptations and exemptions were exercised, the Trustees and the mentor also responded to them. Finally, after different disagreements the SLT-TA hybrid institution was disintegrated and the chief alienated from decision-making.

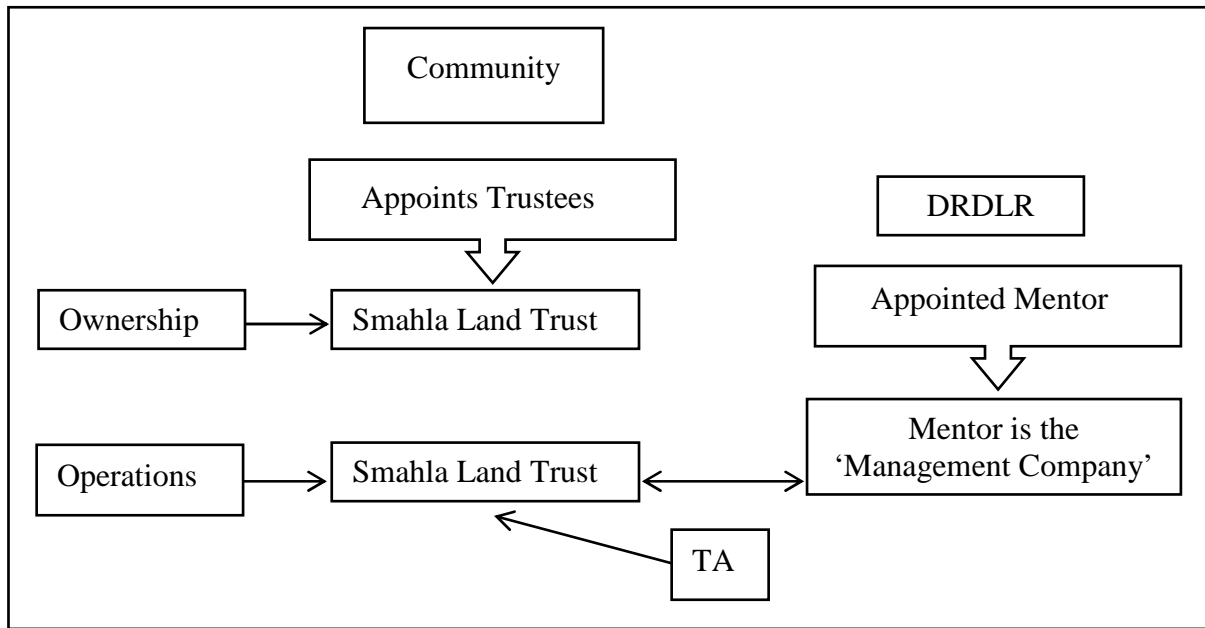


Figure 11. Adapted (*customary*) institutional arrangements for the management of the second farm (Arthur Seat Farm). Source: Own elaboration.

Nevertheless, this has come at a cost. Its opposition are undermining the Trust credibility in the eyes of the community and thus, it was found that some community members are disappointed and opposing to the Trust. Related to this subject, 2 interviewees (of 16) expressed their disappointment and distrust to the SLT. In addition, one of the Trustees shared that she was thinking on quitting the SLT because of the many 'bad rumours' against it. Other Trustees expressed their concerns of the TA opposition, the social pressure product of different rumours and the inability to communicate with the community now that the TA is not allowing these meetings to take place (pers. comm. SLT members). In summary, the process of land institutional reform is greatly complicated by the constitutional recognition of the institution of traditional leaders whose roles, functions and powers have not been clarified, who are not democratically elected and antagonise efforts to establish new land institutions (c.f. Ntshona and Lahiff, 2003).

Why the SLT is failing?

In my opinion, the failure of the Amaswazi community to farm productively their second farm so far, mainly lies in two factors: 1) contradictory institutional and legal pluralism that undermines institutional efforts to establish management regimes and authorities to use and manage resources and, a 2) general void of agricultural (farming) education that could allow Amaswazis to better take management decisions.

As has been explained in this chapter, two local antagonist institutions, one traditional and other state-introduced are trying to keep the control and authority over the second farm resources in Amaswazi. Tension and open conflict endangers the future of the SLT and its role as the resource management institution for the second farm. The continuing importance of the TA in Amaswazi is strong and it can be attributed to a range of factors: the power they continue to exercise (land allocation as experienced in the first farm), the high degree of legitimacy that it enjoys in the community, the strong objective of the TA to continue exercising its power and finally, the failure of democratic government to clearly define its

role (c.f. Van Kessel and Oomen, 1997; Ntshona and Lahiff, 2003; Williams, 2004). Prove of this is Amaswazi community members' perception of the situation: "in public no one will dare to say anything that contradicts the chief" (pers. comm. woman from Amaswazi community, vice-chairperson from the SLT). Thus, in my opinion, in the medium run, the chief may win the present power and authority struggle with the second farm.

On the top level, though DRDLR is supposed to decentralise resource management institutions, decentralisation has consisted in the devolution of land and water, decision making over those resources but, without the financial decision making devolution to the SLT (pers. comm. chairperson and vice-person of the SLT). When the land and water was bought from the previous owner, DLA transferred this resources and the authority to manage them to the SLT. Yet, around ZAR 7,5 million (about €750,000²⁹) were also 'transferred' to the SLT as investment and management capital to start the operation of the farm. By 2010, when the fieldwork for this thesis was done, no one from the SLT, the community or the TA knew what the balance of grant (BoG) was for the community, how much money had been spent already, how much was left, etc. The exact figure was not known by the local DRDLR official that manages the case (pers. comm. DRDLR Ladysmith officials). In relation to the lack of adequate transfer of information and communication between the Department, the SLT and beneficiaries, officials admitted they have had communication problems, influenced by the departure of former Ladysmith DLA head official (for a corruption accusation) that managed Amaswazi's case (pers. comm. DRDLR Ladysmith official).

The SLT members pointed out that it was difficult for them to make farming decisions and operate the farm commercially because amongst other things, every time they needed to buy inputs for production, they had to follow a long procedure to get capital from the DRDLR and then finally purchased their inputs. When asked about this issue, DRDLR official first answered that SLT had to plan and communicate in advance to DRDLR if they wanted to get capital on time when they needed it. Though it sounds reasonable, later on in the same interview, DRDLR official answered that one of the bottlenecks that undermined the efficiency of their work was the exaggerated bureaucratic procedure they have to follow to get things done. "Documents round back and forth for at least a month before getting the final signature. And that is with everything. So if you ask me, what I would change to improve the implementation process? I would take away all the signatures that are needed to get something done. Bureaucratic nonsense is stopping reform" (pers. comm. DRDLR Ladysmith official).

Thus, at the moment there are two local antagonist institutions, one traditional and other state-introduced that are trying to keep the control and authority over the resources. On the top level, DRDLR still maintains its share of decision making, especially on how financial capital is invested and used. DRDLR has also acted as intermediate between the TA and the SLT. Thus, between these three institutions it can be seen that from one side, the TA is trying to implement it's own customary rules of land management, while the SLT under the guidance of DRDLR tries to impose and follow their own rules to achieve the commercial agriculture objective. So far, local law or the outcome of legal pluralism has resulted in the implementation of State or SLT rules. But as expressed before, this may change in the near future.

²⁹ Rate: €1:ZAR: 9.58 October 18th, 2010.

Finally, a general lack of knowledge and farming education in the hands of SLT members have betrayed them in their efforts to productively manage the farm. Though, some educated people form part of the trust, their farming knowledge is limited. Commercial farmers are right when they say “for us farming is already very difficult and we have the knowledge of generations working in this area. Farming is a hard profession. You have to deal with market prices, finances, water scarcity, workers, stealing, etc.; so, without a doubt this profession is a challenge for new black farmers that do not have the family tradition and the experience to confront all these issues” (pers. comm. commercial farmers). Yet, it cannot be said that new farmers are not able to farm. Stronger capacity support and farming education is needed, as well as, adequate transfer of information and good communication with State institutions. This has not been effectively provided in this study case and the literature confirms that similar experiences have been encountered elsewhere in South Africa (Tilley *et al.*, 2007; Tilley and Lahiff, 2007). As a result, the transfer of land and water resources in Amaswazi has not yet materialized in the transformation of their livelihoods and related socioeconomic status.

Box 3. Amaswazi efforts to develop commercial agriculture

In 2008, motivation to plant soya was undermined by a low harvest. As the farm had just been transferred, the previous owner helped the community with the crop. According to him and members of the SLT, the problem lied in organisation problems and thus at the end, they planted too late. A total of ZAR 780,000 was obtained from the harvest but according to the SLT Chairperson there was no profit and all went to pay costs (pers. comm. SLT Chairperson).

In 2010, DA of Bergville assisted the community and brought in a project to plant cabbage. Besides from the technical advice, DA contributed with the inputs and infrastructure for planting 5 ha. “We gave them seeds, fertilizers, chemicals (pesticides)” (pers. comm. DA regional Bergville official). Nevertheless, an irrigation problem presented. According to DA official in early 2009 a meeting was held with the SLT and they were warned that pivots were going to be needed for the cabbage. “They have 2 pivots and till now, none of them is working” (Bergville DA official). Around 10,000 seeds were planted and as pivots were not fixed on time, the SLT proposed to irrigate with buckets! “But that was too difficult, it was too much area so they failed” (Bergville DA official).

When asked to the SLT members why the pivots are unused and have not been repaired, they answered that they do not know how to fix them. ‘We were going to fix them, but at that moment, the mentor was fired and so far we have not found another person that could do this’ (pers. comm. SLT members). In addition to pivots, pumps and dams (all of the water technology) is not being used. The same falls for agricultural tools (such as tractors and sewing machines). These agricultural artefacts with which commercial farming could be developed are being abandoned for organisational, institutional and educational reasons explained in this section.

Source: Information from this box was collected through in-depth interviews with Amaswazi inhabitants. The previous owner of the farm and DA officials was an important source of information.

Chapter 5. Decentralising resource management institutions

5.1. The establishment of the Central Okhahlamba Winterton WUA

The promotion of local governance and the transfer of water management to user groups commonly referred to as Water User Associations (WUAs) has been central in water reform processes (Vermillion, 1999; Meinzen-Dick et al., 2002; Molle, 2004). Participation has moved beyond project execution to policy reform and self-governance, and it has even been considered as *the way* to operationalize decentralisation for democratic transformation (Cornwall, 2001) and empowerment. Participation has thus emerged as a central concern. Despite significant claims on the little evidence of the long-term effectiveness of participation in materially improving the conditions of the most vulnerable people or as a strategy for achieving social change, “participation has become an act of faith in development” (Cleaver, 1999: 597). Involved in the ‘participation’ paradigm, the post-apartheid South African government has defined it as its cornerstone to redress past policies.

In this chapter the development of the Central Okhahlamba Winterton WUA and the establishment of its Management Committee (MANCO) that will manage the Little Thukela catchment is studied. Policy is seen as a process (Grindle and Thomas, 1992) and thus emphasis is placed on the processes of the WUA establishment. The process and its outcomes are discussed in section 5.1.2 and 5.1.3. In section 5.2 a more general discussion on the processes of decentralisation undertaken by DWA in KwaZulu-Natal with relevance to the Little Thukela catchment is addressed.

5.1.1. The context of the Central Okhahlamba Winterton WUA

The Central Okhahlamba Winterton WUA is the platform where commercial farmers and rural communities from the Little Thukela catchment are supposed to meet. It has been anticipated that through the participation of all MANCO members, joint democratic decisions on water management would be exercised. Ideally, negotiations would also take place between commercial farmers and the rural communities to share and/or redistribute water scheduled.

Nevertheless, in Chapter 3 the divergent strategies of commercial farmers to acquire more water and control have been shown. Their strong organisational structures, their creative ways in concretising water rights, inclusion/exclusion games amongst themselves, etc. have demonstrated their innovative capacity to adapt and adjust to reform.

On the contrary, in chapter 4 the challenges communities face in acquiring resources and their difficulties with common management have been explained and discussed. Division and patronage systems within communities, fuzzy institutional structures through municipal, private companies and/or traditional “cooperative” governance, disconnections between land, water and infrastructure reform, etc. are some of the general difficulties and challenges they face to actually use resources as means for several ends.

Giving this context, establishing the WUA in this socio-political unlevel playing field was set up to fail and the capturing of the institution by commercial farmers could be expected. Unless well facilitated, which despite efforts did not happen, the process had little chances to succeed according to equity objectives. Thus, DWA urgent wish to establish WUAs so their

objectives and activities area achieved seems to be not in line with the NWA objectives to redress apartheid policies.

5.1.2. The process

According to the NWA (section 98 (4)) a proposal for transformation of IBs into WUAs should have been submitted by February 29th, 2000 (DWAF, 1999). Yet, to date the process of establishment of the WUA in the research area has not yet finished. Originally, catchment management agencies (CMAs) should have been already established for the nine water management areas (WMAs) and after, WUAs should have followed. Yet, the DWA has switched the order and now WUAs have been established while the process of the CMAs also takes place.

According to the 'IB transformation guideline' (which was sent by DWA to the IBs at the beginning of the process) strong emphasis is placed on appropriate community, racial and gender representation in the WUA. This document also warns of the possibility to enlarge the area under control by the former IBs in order to include HDI users (DWAF, 1999). Aware of the fact that most of HDIs are not *currently* relevant users for agricultural water because of their lack of land and limited access to water and infrastructure, DWA made explicit that "domestic water users will in most cases be an interest group of sufficient significance to justify a nominated representative on the management committee" (DWAF, 1999:17).

It is interesting to notice that according to the NWA the proposal of transformation (read: constitution of the WUA) had to be submitted by former IBs that had to be transformed by law. It means white commercial farmers had to mobilize, reason and take decisions on how to include HDIs to 'transform' the IBs. Specifications of who had to be involved in this process are not written. As a result, it is seen that right from the start (white) commercial farmers had to take the lead, organise and work if they wanted to continue with their irrigation schedules. "Black members have not been present in the meetings, so we and DWA have been planning the integration for them" (pers. comm. Little Thukela chairperson). Simultaneously, this gave them the authority to control the water management transformation process as *domains of interaction* were left for them to direct, plan and organise for the later integration of HDIs in the transformation process. In consequence, HDIs users and other (MANCO) members (see table 3) were not involved in process design.

At the beginning, the government wanted to establish one WUA for each IB in the Little Thukela catchment. Eventually, after many discussions and negotiations with commercial farmers, DWA allowed the establishment of a single WUA instead of 4 (one for each IB in the Little Thukela catchment). This evidences the *agency* capacity commercial farmers have to shape strategic interactions to the degree it benefits their interests.

According to commercial farmers, two important reasons backed this choice. First, the 4 rivers join the Little Thukela at the downstream and thus are directly interconnected and form the Little Thukela V13 tertiary catchment. So in a hydrological 'integrated water management' way, it made sense. Second, IBs share waterworks and infrastructure. They also share administrative expenses and employ the same accounting offices to handle the IBs. Yet, more important than these two points, is the fact that having one WUA allowed commercial farmers to manage the four IBs as usual without having to include HDIs in each of them and change their organising practices. If four WUAs would have been established in the catchment, each would have had to include HDIs, which directly would affect the functioning

of the IBs. Thus, from the commercial farmers side, it seemed more logical and practical to have one WUA instead of four. “The WUA works like an umbrella and the IBs are like sub-districts. Thus, our meetings from the IBs will continue” (pers. comm. Secretary of the IBs and WIS chairperson). The fact that they have the capability to impose the decisions they favour under a participatory decision-making process before State authorities and the *mobilization of bias* within State officials so they favour their choices clearly uncovers the *power* commercial farmers hold.

After this first negotiation -won by commercial farmers-, focus shifted to the establishment of the membership of the new WUA and its MANCO. Former IBs chairmen became *de facto* founding members. Though this could be seen as a built coalition (Biggs and Smith, 1998) in this case it is noticed that in the official ‘IBs transformation guideline’ (DWA, 1999) it is stated that founding members of the MANCO have to come from the former IBs elected representatives. Then, according to hydrological considerations, upstream and downstream communities in the catchment were selected as interest groups that had to be included as stipulated by law.

Till here, the Constitution had been submitted, members selected and the extent of the area of management determined. No HDI had been involved in the planning process so far. The decisions made were just the result of negotiations between the government (DWA) and the chairpersons and other representatives from the IBs. Integrative negotiation theory in designing participatory interventions where actors develop problem definitions and perceptions on the basis of collective social learning processes have been promoted because of the belief that their application may facilitate ‘win-win’ solutions (Meegeren and Leeuwis, 1999; Leeuwis, 2000). Nevertheless, this study shows that as HDIs members have not been included in process (and planning) design, *domains of interaction* have been captured by commercial farmers.

Finally, to include HDIs a ‘public awareness campaign’ was organized by the IBs. Multiple advertisements were placed in newspapers to announce the new WUA and invite community members from the Okhahlamba municipal area to join the process of transformation. DWA thought there had not been enough publicity and they reinforced this process and advertised again. It is observed that participation is supposed to depend on a mobilization process (c.f. Cleaver, 1999). Finally, a first meeting was held with the assistance of DWA officials in 2009. From the minutes of the meetings it becomes clear that participation diminished as the process advanced: In the first meeting, 50-60 HDIs attended. Then, in the following public meetings, the number was reduced to 15. By the end of 2009, the HDIs number was reduced to 8 persons that kept attending the WUA meetings (pers. comm. DWA officials, Secretary of the IBs, HDI chair deputy in the MANCO).

It is suspected that numbers decreased for multiple reasons: First, the main language of meetings was English with summarized translations to Zulu, Second, explanations and discussions about the role of the WUA and other management terms were summarized, insufficiently explained or time constraint; Third, according to commercial farmers representatives in the MANCO, different people showed up because they thought that an economic benefit would derive from participation, thus as soon as this was clarified, a lot of people stop coming. These were some drawbacks of the process that have been experienced in other institutional transformations elsewhere in South Africa as documented by Van Kopen *et al.*, (2002).

One problem arose from these 8 persons. When HDIs were invited, everybody from the Okhahlamba municipality area was invited. Yet, the municipal domain and frontier does not fit with the hydrological area of the Little Thukela catchment. As such, 4 of the 8 persons were out of the WUA area. As a result, commercial farmers explained to them that they could continue coming to the WUA meeting if they wished to do so, but no compensation or management position could be given to them because of their geographical position (pers. comm. Secretary of the IBs, HDI chair deputy of the MANCO, Sterkspruit and Little Thukela chairperson). After this conversation, these 4 members stop attending meetings.

DWA officials were asked about this MANCO members story³⁰ and questions were raised about MANCO representation and inclusion of HDIs. Surprisingly, a DWA official referred to these members (and the communities from which they come from) as if they were under the WUA area. Nevertheless, the WUA area and the communities it comprises are clearly stated in the WUA Constitution. Thus, the 4 members that were joining WUA meetings were effectively not from the WUA management area (Central Okhahlamba Winterton WUA).

The founding members (chairmen of the IBs) arranged the first election of other members for the MANCO. In practice, each chairman was included as each of them acted as representative on behalf of IBs members. Then, from the 4 HDIs that rested from the public awareness campaign, 2 HDIs representatives were selected by commercial farmers, one woman from Kethani (urban settlement with no agricultural plots) and one farm worker from Amaswazi. Though they are supposed to be representing this sector, neither can be considered as emerging farmer. This poses questions towards the suitability of this selection to represent water users as to what issues/interests exactly are these representatives going to defend (domestic water or possible water reallocations for farming?). The final MANCO members' list is as follows (April 13th, 2010):

Table 3. Central Okhahlamba Winterton WUA MANCO members.

Emerging Sector	Commercial Sector	Associate Members*
Emerging farmer	Little Thukela IB	uThukela District Municipality
Gender representative	WIS IB	KwaZulu-Natal Wildlife
	Sterkspruit IB	Traditional Authority
	Lindequespruit IB	Rate Payers Association

Source: Own elaboration from official MANCO excel sheet. *In the list of associate members it is noticed that the uThukela District Municipality, KZN Wildlife and TA representatives comes from black South Africans descendants with the exception of the representative of the rate payers association.

Two things can be highlighted from this process: First, inclusion of MANCO members is unbalanced as water users representing the commercial sector' interests double the rural communities representatives. Second, representation does not meet objectives as it is not clear what interests the selected MANCO members are supposed to represent (emerging farming sector, rural communities that prioritize domestic water, gender representatives?).

³⁰ The recollection of the above presented sequence of HDIs participation was collected and cross-checked with different interviews from MANCO members. These include IB chairpersons, Secretary of the IBs and the 2 HDI representatives that integrate the MANCO.

As it can be observed in table 3, *inclusion* and *representation* seems contradictory to former objectives established in the NWA and the 'IB transformation guideline'. "The transformation process also requires that other imbalances within the area of operation of a water user association be addressed. The process should, amongst other things, aim to:

1. Avoid a situation where one group is being dominated by another;
2. Ensure representation for minority groups; and
3. Assist in resolving conflict by creating balanced representation in terms of the various categories of users" (DWA, 1999).

So what happened? Why not leave the 4 former HDIs members to balance with the 4 chairmen of the IBs? To these questions, DWA officials explained that they did not see inclusion in this way. "There are 5 and 5. The 4 commercial farmers with the ratepayers association sum 5 white members. Then we have 2 emerging farmers (actually 2 black representatives with no interest in becoming emerging farmers), plus the TA, plus the municipality and KZN wildlife. So that makes 5 and 5" (pers. comm. DWA Institutions official for KwaZulu-Natal). Yet, when asked about the balance of the agricultural sector in terms of members defending water for agricultural interests, they admitted that there was a racial and socioeconomic imbalance in the MANCO. Moreover, in contradiction to what DWA officials answered, the fact that there are 5 and 5 does not ensure equal representation, as the TA and KZN Wildlife representatives do not enjoy voting rights. Despite of the failed effort to reach a racial balance amongst MANCO members, it is more important that representation of water users has been bypassed (as it has rather been based on skin colour without taking into account what sectors is each members actually representing) and thus not achieved.

In consequence, it is acknowledged that the MANCO is unbalanced according to the numbers of representatives related to water for agriculture and also in decision-making rights. According to other DWA officials, this is not surprising, as "representation in the MANCO has to be directly related to land ownership" (pers. comm. DWA officials). This follows the principle that stakeholders that have more land and water shares have more to lose if water is not correctly managed, so in turn they have higher incentives for water management. Thus, it seems contradictory to seek the transformation of former IBs into WUA with the objective of redressing racial and gender representation of water users if in practice, members at the MANCO and members of the WUA have to be proportional to the share of land and water resources stakeholders have at stake. This highlights the importance of connecting land and water reform in current reform processes as water management institutions in Little Thukela show that *transformation* is targeting current land division rather than foreseen possible future resource allocations.

At the moment, the Constitution has been finished and discussed with all MANCO members. According to commercial farmers, the process has had many backs and forth. "First we select the members and then we had to explain things, but that process was too fast for them (HDIs), so we had to explain again the Constitution of the WUA and now, we are finally writing the business plan" (pers. comm. Secretary of the IBs, chairmen of the IBs).

In addition, DWA implemented multiple gender trainings in which both commercial farmers and HDIs were asked to participate. While HDI representatives in the MANCO regarded these trainings as positive, as an opportunity to exchange with other members and to learn

(pers. comm. gender and emerging sector representatives in the MANCO), commercial farmers refused to follow the trainings sessions (they attended only once) because they regarded it as an useless time consuming activity (pers. comm. commercial sector representatives in the MANCO).

5.1.3. What outcomes?

A change of legal entity (from IBs to WUA) will be achieved when the WUA Constitution is accepted by DWA. However, the real 'transformation' approach has resulted in two main contradictory features.

First of all, as stated by the 'IB transformation guideline' management geographical domains may be extended in order to include HDIs (DWA, 1999). With the acceptance of DWA to join the four IBs into one WUA along with adjunction of upstream and other disadvantaged communities, the water management institutional domain was transformed geographically. This has meant the extension of control of the WUA. As commercial farmers have directed and controlled the WUA so far, and most likely they would continue to do so in the near future, their *water control* has been reinforced.

Commercial farmers involved in the WUA establishment process are very aware of the benefits of the WUA: "The watershed is under the WUA jurisdiction so now with this new institution, control over water will be possible everywhere"; For farmers downstream is important to control what is happening up, where the water is born"; "If traditional authorities want to build a dam upstream they have to ask for our permission now"; "It is a challenge to incorporate black people in the management of the institution, but this is very advantageous for us because with their integration we will be able to control the whole catchment and protect existing users" (pers. comm. commercial sector representatives in the MANCO).

Second, contrary to Leeuwis (2000) warnings about possible conflictive participatory forums, the MANCO of the Central Okhahlamba Winterton WUA has in general not experienced a conflictive establishment process amongst its members. Leeuwis (2000) noted that it is not easy to make actors set aside their conflictive interests during the process. Furthermore, different actors are located at different institutional layers and have different power positions (e.g. DWA regional officials vs. the IBs that have to respond to this authority, and IB chairperson vs. new (HDI) users, or as envisioned for the near future CMAs vs. WUA that should report to them) so it was expected to encounter more difficulties in the process and/or challenges from HDIs representative towards already set rules (like the established WUA Constitution by the IB farmers). Nonetheless, this study shows that active participation and responses from HDIs (to defend and promote the interests they are supposed to be representing from the whole emerging farming and black heterogeneous communities) have not been experienced so far. What explains this behaviour? What can the *process* of establishment of the WUA tell us about this?

In a controlled "participatory" environment, the elements -social actors- that are inside have little opportunities to influence boundaries of the established organisation. The process of establishment of the WUA shows that those boundaries and the rules of the WUA game had already been established by both commercial farmers, as well as DWA (e.g. IB transformation guideline) and central government through the NWA (1998) by the time the HDIs members joined in. Significant participation has also been aggravated by the fact that the solely two 'emerging farmers' representatives in the MANCO cannot be considered as

emerging farmers. Individuals are only partly enrolled in the projects of others (Long, 1992). In addition, the nature of the meetings amongst all stakeholders were practical rather than seeking to rise and question strategic needs. The playing field is not levelled as well. Commercial farmers have generations of experience and education in agricultural water management while the two HDIs MANCO representatives are newcomers that are not even enrolled in any small-scale agricultural practice. In consequence, ‘participants’ have been left with little opportunities to influence structural factors that could shape reallocation objectives. Thus, instrumentality rather than empowerment is observed. This study case confirms other studies that have looked at this issue (Cleaver and Kaare, 1998).

The study shows that contrary to achieving equity and redress objectives printed in the NWA (1998), the decentralised establishment of the MANCO of the Central Okhahlamba Winterton WUA under the participation and empowerment paradigm, has empowered commercial farmers. HDIs or communities (‘women’, the ‘poor’ and the ‘socially-racially excluded’) have just been instrumentalized rather than empowered. This may be translated in unfavourable consequences for the emerging sector and black communities.

It is argued that it is doubtful whether ‘integration’ around the WUA organisational establishment would ever succeed first in reaching all water users and second, in empowering HDI groups. Two reasons explain this. First, membership in the WUA is voluntary, but a levy has to be paid for administration (O&M costs). Thus, “not all communities will be integrated” (pers. comm. DWA Regional Durban official). According to DWA, emerging farmers that have a schedule use and that want to be part of the WUA will be subsidized by the IBs. As anticipated, commercial farmers do not fully agree with this, but they believe that emerging farmers’ membership would not be massive as they are constrained by land and hydraulic infrastructures that could allow them to improve water access. Second, commercial farmers and HDIs communities have different water needs and priorities because of the division of labour and power structures in wider rural society. “Black people have not seen the potential of water yet. So their worries are about getting a tap for domestic consumption while we need dams for irrigation” (pers. comm. Sterkspruit farmer)³¹. In consequence, it is concluded that water reform alone would not ‘wash away the past’ and on the contrary, it is needed to link land, water, infrastructure and institutional reform to achieve redress objectives. Furthermore, WUA priorities as the institutional framework has designed it (read: meant for water management and waterworks (pers. comm. DWA Regional Durban official; NWA, 1998: section 98)), may need to change if institutional decentralisation is truly to redress inequitable land and water access for HDIs.

³¹ This fact was personally experienced while living in Amaswazi and Potshini communities during the fieldwork. As a new temporary household member living in the communities, I tried to help in daily domestic activities and this included fetching water. While practicing this activity with other household members, I confirmed and understood their complains and the prioritization of DWA to support supply services for former excluded communities.

Chapter 6. Conclusions and Recommendations

The work presented in this thesis aimed at answering one main question: *How have water institutions concerning resource management and decision-making power evolved over time, and how have they changed and been rearranged in response to land and water reform policies implemented in the Little Thukela catchment, in South Africa?*

Two research questions were defined to answer the main question presented in chapter 1.5. First, it was asked to study the organising practices and strategies that historically powerful water users (commercial farmers) in the Little Thukela catchment mobilise and use to control and/or maintain land and water resources. Second, it was foreseen that along the first question, it was needed to understand how land and water reform was being interpreted, addressed and implemented by different institutions in the Little Thukela catchment.

The previous discussions of different case studies (organising practices of commercial farmers in chapter 3, land and water transfers and institutional devolutions in Potshini and Amaswazi in chapter 4 and the establishment of the WUA in chapter 5) in this thesis have presented the diverse -often contradictory- nature of organising practices implemented by *competitive* social actors (Molle, 2008) that live in the Little Thukela catchment. Land and water reform processes happening in former disadvantaged communities have been studied for two reasons: first, to understand why concrete efforts to address small and localized reforms at community level are ‘failing’ and second, because if this is understood, then broader participatory challenges and membership in the WUA could be better understood. In parallel, commercial farmers and their organising practices to adapt and adjust to reform processes have been also studied and discussed.

Therefore, the first part of the conclusions (6.1) gives a summary of the sociotechnical relations of power and resource control in the Little Thukela catchment. In the second part in section 6.2, the first research question is answered. Hereby, focus is placed on the different collective and individual strategies commercial farmers are developing to anticipate, adjust and shape land and water reform processes that directly contradict their personal and economic objectives. In section 6.3, focus is shift to discuss and conclude on land and water reform implementation cases. First, conclusions are drawn on the two land and water resources re-allocations studied in this thesis. Attention is giving to discuss land reform implementation processes and the different difficulties and problems social actors encounter to successfully use devolved resources. Second, the establishment process of the WUA and its outcomes is discussed. In section 6.4, land and water reform implementation efforts in the catchment are analysed on parallel. The reallocation of farms and land and the establishment of the WUA are discussed. In this section an effort to critically reflect on the next step that needs to be well thought and address to possibly implement successful reforms in South Africa is presented. Finally in the last part of conclusions, a conceptual reflection is discussed in section 6.5.1 followed by recommendation in section 6.5.2.

6.1. Sociotechnical relations of power in the Little Thukela catchment

The historical distribution of land and water resources accompanied by the social construction of infrastructure and the socially constructed relations where power is shared and intertwined and through which water control is exercised, are all crucial factors that

partly explain resource distribution and use, along socioeconomic patterns in the Little Thukela catchment. In consequence it is noted that sociotechnical relations of power *create* and are able to *recreate* the context in which organising practices and reform processes are taking place.

The context of the Little Thukela catchment reflects the social and racial disparities of South Africa's political past. With the exception of a couple of farms, commercial farmers still have their historical land shares and some have increased their area. With the water registration process driven by DWAF in 2000, commercial farmers ensured their historical (water) riparian rights and some of them even used this "reform" process to register more water. Water infrastructure has kept in the hands of commercial farmers, and they have continued to develop it in recent years with the construction of two new dams: the Lindequespruit and the Mtsugwana. Former Irrigation Boards (IBs) are in general integrated by the same users, and their management and functions have not changed and will not change even after the official establishment of the Central Okhahlamba WUA as detailed in chapter 5. "The WUA will be like an institutional umbrella in which the IBs are sub-districts or departments" (pers. comm. Secretary of the IBs).

Four IBs integrate Little Thukela's WUA: the Little Thukela IB, the Winterton Irrigation Settlement (WIS) IB, the Sterkspruit IB and the Lindequespruit IB. IBs were established in 1910 and since then, they have been water management institutions through which commercial farmers are organised and share multiple collective water control practices.

The main task of IBs is water management. Each of them is in charge of monitoring of water flows, operation and maintenance (O&M) of the water, waterworks and water infrastructure, collection of levies and management of finances. Nevertheless, crucial activities are planned and strategise through the IBs for the sustainment and improvement of water access for IBs members. One of these crucial activities has been the development of water infrastructures through dams. In consequence, IBs have been historically used as a platform for commercial farmers to strategise and secure water resources that are vital for their economic activities.

In 1986, Sterkspruit IB commercial farmers built the Bell Park dam. Later in 2005, Lindequespruit IB farmers built their own dam. Most recently in 2008, the Mtsugwana dam was built through a strategic alliance between Sterkspruit, Little Thukela and WIS IB commercial farmers. The later was built after the BBE mandate was passed by law and in consequence, it could have been shared by HDIs though no water share is destined for these users.

Though commercial farmers independently strategise and adapt to land and water reform to secure resources for their well being as detailed in chapter 3.4, IBs have been clearly the strategic arm of commercial farmers to enhance water control and secure more water resources for future developments. As shown in chapter 3 and 5, commercial farmers have been successful in that quest even under land and water reform processes that directly contradict their interests. It is thus appreciated that sociotechnical water control systems that have been historically under the control of commercial farmers in the research area, have effectively adapted and contested reform processes and as a result, there has not been a significant change on water control. This decisive fact reminds the work of Giddens (1984), which explains that power within social systems, enjoys some continuity over time and space.

Sociotechnical relations are constructed through time and space with the development and collective management of common projects and practices that are implemented by commercial farmers independently and/or through the IBs. These relations reflect water control but they are also used as means to reinforce control and thus, power. This implies that if sociotechnical relations are changed, water control and power may change as well.

At national level the fall of apartheid meant the end of the political will to support commercial farmers and on the contrary, the new government is supporting public policies that seek the transformation of South Africa's rural structure. Nonetheless, this has not yet translated into the transformation of sociotechnical relations of power in the research area that may *recreate* access to water and control.

The question then is if current public policies through land and water reform processes are capable to transform the sociotechnical relations that highly determine the context and the outcomes of reform? And if so, what is failing and how it could be better implemented to achieve redress objectives? In the following sections and with the use of the different study cases of this thesis, it will be explained why sociotechnical relations have not been successfully changed and what is needed to give room to transformative land and water reform processes in the Little Thukela catchment.

6.2. Answering question 1: Organising practices and strategies of commercial farmers

The commercial farmers group though often referred in this thesis as a general group, have internal differences. Amongst themselves, differences in land and water allocations and strategies are experienced. Commercial farmers from Little Thukela and Sterkspruit have been historically powerful groups. The first, because of their geographical position in the strongest river of the catchment and the second, because of their access to water infrastructures. In contrast, Lindequespruit and most of all, WIS farmers have been in a less advantaged position to access and control water.

This study has shown that the balance of power and water control shifts as water infrastructures are developed. With the construction of the Lindequespruit dam in 2005, Lindequespruit IB farmers have gained water control in their sub-catchment. With the construction of the Mtsugwana dam in 2008, Sterkspruit farmers have been the most benefited. In addition, WIS farmers have gained water control as they receive water directly from the Mtsugwana dam. On the contrary, Little Thukela IB farmers have been the less benefited and though they have invested in the Mtsugwana dam, they cannot take water directly from the dam as explained in chapter 2.3.

Amongst commercial farmers and IBs, different strategies are exercised to secure and improve water control. *Water registration* has been used as an opportunity to register water and in some cases to register even more rights. In general, this strategy allowed commercial farmers to maintain former riparian rights. In consequence, though water registration is supposed to be part of the water reform processes, it has rather legitimized riparian rights securing water for commercial farmers.

The development of the '*pool*' strategy originally developed by Sterkspruit farmers with the Bell Park dam and most recently also applied for the Mtsugwana dam, shows the innovative capacity of commercial farmers to protect their formal water rights in times of water reform.

In order for DWA to implement any reallocation of water, they first need to call for what is known as a ‘compulsory water rights registration’ (pers. comm. DWA officials). When this happens farmers have to report: (1) the total amount of water they are entitled to and (2) the actual amount of water they plan to use. Those ‘leftovers’ that are without use are the first water that gets to be re-allocated because it is assumed that this water is lost in the system. Nevertheless, if farmers trade leftovers between themselves through the pool, there is no water left without use. As a result, the ‘pool’ strategy is seen as a water strategy implemented by commercial farmers to protect their formal water rights.

A crucial strategy has been the development of water works through the construction of concrete structures by individual commercial farmers and/or IBs. This has given the opportunity to commercial farmers to secure their water rights through dams. In addition, multiple strategies to acquire dam permits are exercised as detailed in section 3.4: construction of the dam before the permit, contract of a consultancy that deals with all the details, from the hydrological studies and the engineering design to negotiations with DWA to get the permit, etc.

The case of the Mtsugwana dam construction process illustrated the organising practices and water strategies some commercial farmers have developed. The case has shown how socioeconomic coalitions are formed to build water infrastructures to improve water reliability during times of scarcity, as well as for expansion. It has also exemplified how *decision reasoning* is influenced and manipulated by powerful actors to win democratic consensus and decisions that benefit certain interests. Moreover, it has exemplified how formal rules and restrictions are changed or circumvented in accordance to the interest and benefits of powerful users (c.f. Meinzen-Dick and Pradhan, 2002). This proves the strong socio-technical and economic and politico-institutional control (c.f. Rap, 2004) some commercial farmers hold in the areas of water management of the future WUA.

In summary, commercial farmers implement multiple and creative organising practices and strategies to maintain and even expand their water control. These have been detailed and explained in chapter 3 and 5, thus responding to the first question of this thesis. The study has shown that commercial farmers have highly innovative agency to adapt to land and water reform. In consequence, the multiple vehicles of change have been neutralised by commercial farmers diffculting reform processes and its outcomes.

6.3. Answering question 2: Circumventing land and water reform in the Little Thukela catchment

In this section, conclusions are drawn from the two resource transfers studied as well as from the water institutional decentralisation process of the WUA. The section is organised as follow: first conclusions from Potshini and Amaswazi land transfers are presented, followed by conclusions from the WUA.

6.3.1. Devolving land and water resources

In chapter 4, two case studies of land and water transfer were analysed. Land reform programs target a core principle: the structure. With the devolution of resources through the transfer of farms, sociotechnical water systems and relations of power may be changed as explained in section 6.1. Giving this acknowledgment, the government has been trying to give a structural response to a structural problem. In the process, the former ruling class is bought out and then land is redistributed to former disadvantaged communities. Hence, farms

are given to a large number of black beneficiaries, entire communities like Potshini and Amaswazi in this thesis, instead of private land titleholders. In this process, a change of the skin colour of the owners is achieved but also the concept of private ownership is replaced by communal rights.

Land reform has been implemented in divergent ways in both cases. Exception to the rule is the main feature and formal institutional arrangements are interpreted and circumvented in multiple ways by different actors. This creates difficulties to understand what is happening on the ground. It also suggests how difficult it must be for local actors that have little education backgrounds to understand what is happening in their own land and why.

In Potshini, it was observed that multiple variations of land reform implementation are exercised. There is confusion between who is the 'decentralised' local institution that has the responsibility to manage the land transferred. A grazing land committee, incapable of exercising its authority is in place, while at the same time, the Municipality appears to also have management responsibilities.

The establishment of the committee as long as the transfer of the deeds and management responsibility to the Municipality are seen as a clear State effort to undermine the agency of traditional authorities related to land administration. Nonetheless, efforts have fallen short before customary traditions that have shaped, contested and circumvented the rules established by formal institutions (grazing land committee). It is noticed that though the Municipality and the Grazing land committee are the formal institutions and should have management control in land administration, their formal rules are not respected and have failed to position themselves as the outcome of local law (c.f. Benda-Beckmann *et al.*, 1998) whilst non-beneficiaries, community leaders and traditional authorities influenced decisions.

In Amaswazi, hybrid institutional arrangements, "which combine elements of traditional or customary set with newer, more formal arrangements initiated by the state" (Cousins, 1995: 10) proved to be, as well, unsustainable if compared to the case of Potshini where the customary traditional institutions have been cast out of the picture. It is observed that traditional authorities have difficulties to accept formal institutional arrangements and their derived guidelines as they conflict with their 'traditional' interests. Thus, hybrid institutional arrangements where only the organisation of the structure is changed, but where little space for manoeuvre is left for changing economic and social objectives within formal top-down LRAD projects may have little opportunities to perform collaborative management.

Under this framework, traditional social actors have chosen the best legal order that protects their interests (c.f. Meinzen-Dick and Pradhan, 2002; Bavinck, 2005) and thus, they have abandoned 'hybrid' institutions. In Amaswazi, it is observed that the current lack of collaboration and rather antagonism between traditional authorities and the Trust may be further affecting the already weak management exercised by the Trust (c.f. Ntshona and Lahiff, 2003).

Both case studies show that newly established resource management institutions within the grid of communal land administration are ambiguous, conflictual and highly contested. One detail that needs to be included in the crafting and reasoning of State implementers is that at the side of the establishment of new, 'democratic' resource management institutions, TA and political patronage systems between municipalities exist (Kwezi, 2010). To establish

institutions as if they are outside or untouched by political relations, systems of patronage and the historical power of the TA seems like trying to cover the sun with one finger.

In addition, the skewed beneficiaries selection (c.f. Kepe, 1999) exercised in both communities, shows the major complications this generates for institutions. As DRDLR picks some members from communities as beneficiaries, the rest of the community integrated by non-beneficiaries inevitable challenge this selection. Non-beneficiaries almost automatically pose obstacles to the newly established institutions and the rules that the selected members tried to put in place. These non-beneficiaries have also joined forces with traditional authorities (TA) that see newly established institutions as a contestation to their traditional powers over land administration. Thus, both groups have joined forces -as experienced in both communities- to shape and recreate institutional arrangements and rules in their favour.

The outcomes from this institutional battle have been far from positive in both case studies. On the contrary, the different communal conflicts over land, institutions, rules and power have left communities without the necessary institutions and organisation to manage and profit from resources devolved.

It is important to note here, that the case of land transfer in Potshini shows that land was given for a specific purpose, which is grazing land, but the government has not accompanied the transfer since it was given (c.f. Tilley and Lahiff, 2007; Tilley et al., 2007). Other governmental and non-governmental institutions have had to improvise to handle land degradation problems that are partly the result from a lack of institutionalisation in Potshini. Thus, a sum of factors have joined which impedes the successful landing of reform in Potshini: first, the skewed selection of beneficiaries, the limited land given (600 ha) to many beneficiaries (77), the uncertainty of the role of the TA within devolved land, unclear formal institutions (is it the Municipality in charge of land management or is it the Grazing land committee, but if it's the later, why they do not have the title deeds? etc.) and the deficit of governmental facilitation, communication and information given to beneficiaries in Potshini that could have helped them to understand and improve the land transfer for themselves.

The case of Amaswazi has been partly different. Land was given accompanied of other multiple resources such as water, infrastructure and capital. Thus, beneficiaries have had different tools and resources with which they could develop commercial agriculture. This shows that the crucial problem has not been a lack of resources like other cases of land reform in South Africa and in my own country, Nicaragua, where land was given and farmers were left with pieces of land they were not able to produce because of lack of tools, capital, seeds, water, etc. Thus, in Amaswazi, the problem has not been about lack of resources. The problem has mainly been about whom, how and for what purpose resources are managed. In that process, governmental support has failed to set the picture clear for beneficiaries, Trustees and TAs. This has considerably aggravated a process that from its conception has been precluded with obstacles.

It is believed that the question on how to deal with traditional authorities is relevant to achieve democratic and institutional decentralisation objectives to effectively manage land and water resources. In both communities, but especially in Amaswazi, one crucial obstacle for the successful management of the farms has been the power competition and contestation generated by the TA with formal institutions (e.g. The SLT). Overlapping institutions in both communities have proved that there is only room for one institution to manage devolved

resources. Essays to create hybrid institutions or to not include the TA have both resulted in conflictive management and in the setting of ambiguous institutions and rules. The question on who has to leave it is not a subject that can be answered with this thesis. Yet, what it can be concluded is that insecurity and confusion over communal land demonstrates a critical need for effective implementation of this type of rights-reform.

On parallel, it is believed that LRAD programs which condition resources to operate for commercial agriculture precluded other discussions regarding alternative uses or the wider needs of communities (c.f. Tilley and Lahiff, 2007). Though government is supposed to promote democratic and participatory projects, beneficiaries have had little space to decide over the purposes of use of land and develop alternatives to fulfil needs, other than commercial agriculture. This top-down mandate has also generated contestations amongst beneficiaries and actors that have summed up to other, already accumulated contestations (e.g. selection of beneficiaries, land use, division of profits, etc.).

Finally, it is reckoned that though the resource paradigm argues that ‘equity of resources’ may enhance individuals ability to pursue well-being (Sen, 1992), it is observed that these alone have not yet materialized for the reasons already mentioned, in the transformation of the livelihoods and related socioeconomic status assumed.

This seems crucial to be considered for further resource reallocation in the catchment. Potshini is a case where resources are limited, land is constrained and land use evolution patterns have proven to evolve in opposition to agricultural development (as shown in figure 8 and 9). On the contrary, Amaswazi is a case where resources (though communal) are available. Land, water and divergent infrastructure both to use water and for farming are there. Yet, when resources have been transferred to communities, other factors have undermined satisfactory management. These should be of major focus on State implementation for land and water reform.

6.3.2. Decentralising water management institutions

When it comes to reflect on the decentralised process of the WUA, it is noticed that giving the socio-political unlevelled playing field, the WUA was set up to fail and the capturing of the institution by commercial farmers could have been anticipated.

The process of establishment of the WUA shows that the rules of the WUA game had already been established by commercial farmers, DWA (e.g. IB transformation guideline) and central government through the NWA (1998) by the time the HDIs members joined in. Thus, it is noticed that in an institutional transformation process, which is partially driven to integrate HDIs, these are excluded from process design, giving the lead to commercial farmers who conquered the WUA domains of interaction from the beginning.

Despite DWA efforts to establish a balanced platform for water management, it is seen that both inclusion as well as representation are unbalanced in the MANCO of the WUA. Two HDIs that are supposed to represent the emerging farming sector are included. On the other side, the commercial farming sector has four representatives. That clearly makes two against four. Above this, a problem of representation is seen as the two chosen HDIs do not consider themselves emerging farmers, as they do not practice this activity. Thus, it is appreciated that both inclusion as well as representation reflects problems. First of all, commercial farmers double the numbers of ‘emerging farmers’ representatives and then, these are not capable of

represent the emerging sector as they have other interests that are not necessarily related to agriculture. As stated by Long (1992), actors are only partially involved in the projects of others.

The integration of the two HDIs representatives in the MANCO of the WUA is not enough (c.f. Mayoux, 1993). It is perceived that the process needed better facilitation so that HDIs could actively participate and negotiate in the MANCO, or at the least, DWA intervention should have ensured these key features: inclusion and representation. This shows how commercial farmers have captured processes. Institutional ‘transformation’ has been resumed to adding two HDIs to an already organised process. Members have to be better accompanied in the process and involve in the whole casting of the WUA. In addition, a different inclusion and representation seems to be needed, as HDIs members have been selected by their colour of the skin or sex and not necessarily according to their water use. More attention is needed to this and to the crafting of the MANCO as the future opportunities to gain access to water by HDIs may depend on its establishment.

The WUA is meant to be a management institution where space for local reallocation of resources and/or to address strategic needs is out of the question. Thus, the WUA is seen as a platform in which discussions over water re-allocation is out of the scope of WUAs. Resource reallocations need to be implemented through other vehicles like State departments, as it has been done so far. The WUA is rather an institution in which water management activities are practiced, but it is also a platform in which needs are presented and negotiated to propose development projects to other institutions at higher levels like the CMAs and DWA. It is thus, in the proposal of needs and in internal negotiations that HDIs must enjoy inclusion, representation and training to facilitate active participation in those processes.

The bulk of WUA will eventually defend agricultural water in broader platforms like the catchment management agencies (CMAs). Thus, it is crucial that the needs of rural communities and emerging farmers are well represented and their voices included in the WUAs as a first step to later defend rights in other platforms. By law, CMAs are entitled to discuss water allocations and they could re-allocate water amongst sectors and actors as they are responsible for issuing and modifying water licenses (DWAF, 1999). Nevertheless, if the emerging sector is not able to voice its needs in the WUAs, opportunities to negotiate in CMAs with even more powerful sectors seem illusory.

Finally, the institutional framework in place for the decentralisation of the WUA has failed to facilitate a balanced integration of all members in the MANCO of the WUA. As shown in chapter 5.1.2, the ‘IB transformation guideline’ failed to specify that HDIs had to be involved in process (planning) design. The conception of the transformation process is that commercial farmers need to transform IBs if they want to continue with their irrigation. In consequence, the official document is rather used as a guide for commercial farmers so they can transform the IBs to WUAs and thus, control the whole process and the institution.

Nonetheless, it is question if this may be the best way to direct institutional transformation processes, in which the purpose is the inclusion of HDIs? An alternative to this could be the opposite. Communities and especially, emerging farmers that have real interests in gaining land and water resources to develop economic activities could be approached and trained first. They could be first included in the areas of historical irrigation of IBs as members, through the structural transfer of resources. Yet, transfer of resources need to be better

accompanied by government and the establishment of land management institutions must be rethought, taking into account power disparities and competing institutions such as the TA in communities as concluded in section 6.3.1.

This could be later accompanied by the inclusion of commercial farmers, which now have in each IB, HDIs members that form part of the water systems they manage. This follows the conception that to have balanced WUAs, IBs have to be transformed first and experienced their own reforms that would oblige IBs to change their own water systems and functions to share resources. This alternative way ensures that sociotechnical relations of power change at the level of IBs, pointing at the core of commercial farmers strength: their collective organisations through which they are organised, strategise and develop water infrastructures to enhance water control.

In the establishment of the Central Okhahlamba Winterton WUA, the contrary is observed. As the possibility to enlarge the area under control of the WUA must be considered in order to include HDIs users (DWA, 1999), it is noticed that commercial farmers used this official mandate to have one WUA instead of four. This meant the extension of control of the WUA, which is dominated by commercial farmers and simultaneously, it avoided the inclusion of HDIs in each IB. As a result, water management, organising practices and water systems have continued as they have always been and the IBs farmers have not experienced major changes. They have just continued to work as usual and view the WUA as a separate institution that does not touch or it is not involved in their water systems.

This may have been different if WUAs would have been created for each IB. Yet, by stating this it is not argued that the formation of four WUAs instead of one would have causally meant an active participation and negotiation processes by HDIs. Instead, the objective is to highlight the fact that it could have been a better option to ensure participation by more HDIs and opportunities for them to change sociotechnical relations of power and present organising practices that are possible -partly- thanks to the existence of the IBs which are untouched in the current establishment of the WUA.

In summary, the emerging farming sector has demonstrated clear difficulties to use the WUA as a balanced negotiation platform for future water reallocations. Thus, the WUA is a successful negotiating platform for future use, but *only* for commercial farmers. As noted by Mosse (2008: 948) “because water is so deeply embedded in society, negotiating new institutions for water management proves to be a complex and contested task”.

The study shows that contrary to achieving equity and redress objectives printed in the NWA (1998), the decentralised establishment of the MANCO of the Central Okhahlamba Winterton WUA under the participation and empowerment paradigm, has empowered commercial farmers. HDIs or communities (‘women’, the ‘poor’ and the ‘socially-racially excluded’) have been instrumentalized rather than empowered. This may be translated in unfavourable consequences for the emerging sector and black communities in the WUA, but also in other platforms like the CMAs.

Thus, it is concluded that the noble purpose of equity and of redress of the inequitable distribution of resources for the South African people do not have yet the response expected. South Africa might be one of the most progressive countries in the world when it comes to water policy thinking (Anderson *et al.*, 2008). Yet, this work has shown the contradictions

between the legislation, the public policy and the capacity of execution in concrete realities. Commercial farmers have been able to neutralise the vehicles of change whilst defending their interest. Thus, social change is not going to happen. Advances may be possible in the measure commercial farmers interests are accommodated. Equity would be achieved to extent commercial farmers interest allow it. Thus, the WUA as it is currently integrated in the Central Okhahlamba Winterton WUA is not a viable institution that favours emerging farmers and communities interests.

6.4. Decentralising resources and institutions

The above three sections have aimed at answering the main research question of this thesis. It has been discussed how resource management institutions and decision-making power has evolved and adapted. In section 6.2 it was emphasized that commercial farmers have developed multiple innovative strategies and organising practices that have neutralised different reform efforts. In section 6.3, the different obstacles, difficulties and challenges faced by communities and land reform beneficiaries were discussed. Moreover, outcomes on the WUA decentralisation processes have been discussed, emphasizing in the particular processes of the case that have generated those outcomes. Thus, the motivation of this section is to reflect on the public policies that have been chosen to reorganise South Africa's rural structure.

As a result, the question is if current public policies through land and water reform processes are capable to transform the sociotechnical relations that highly determine the context and the outcomes of reform?

As explained in this chapter, government has been given a structural response to a structural problem. This has been motivated and justified by the belief that a change in the structure, meaning to say, that a change in the sociotechnical ownership of resources may change relations of power in rural societies. As a result, it has been assumed that the transfer of resources to communities would be the answer to the inequities of the past.

This thesis has argued that this is not enough. The transfer of resources to communities and/or the adjunction of HDIs into unbalanced platforms would not do the job of overcoming inequality. Resource transfers and the decentralisation of institutions alone would not 'wash away the past'. This has proven to be insufficient in the Little Thukela catchment and the reasons that explain why it has not worked have been discussed in previous sections.

The noble purpose of equity and of redress of the inequitable distribution for the South African people do not have yet the response expected. This thesis demonstrates the contradictions between the legislation, the public policy and the capacity of execution in concrete realities. The institutional decentralisation processes for the management of communal land has proven the unsustainability of these institutions under the particular tribal circumstances in which institutions are supposed to function. The WUA, which is supposed to be a vehicle of change, has been neutralised by historical powerful users: commercial farmers. Thus, the WUA is a successful negotiating platform for future use, but only for commercial farmers.

Does this mean that WUAs would not work? Are we investing in wrong vehicles that have demonstrated to be platforms captured by commercial farmers and that are rather used as legitimatisation platforms in which change and empowerment of HDIs are not achieved?

This thesis argues that WUAs and decentralised resource management institutions in communities could work if: 1) institutional support and monitoring to beneficiaries is given, 2) education and appropriate mentorship on farming, irrigation and water management is facilitated, 3) clear institutional arrangements and institutions on land and water management are established, 4) the role of traditional authorities in land management and administration is clarified, 5) inclusion and representation aspects are ensured in ‘democratic’ and ‘participatory’ institutions and finally, 6) if land, water, infrastructure and other resources are interlink and facilitated to facilitate the mobilisation of resources to achieve defined socioeconomic outcomes.

The thesis has proven that in the absence of these conditions, reform implementation fails its objectives. Much emphasis has been placed on understanding and crafting the conditions that institutions may enjoy to be successful (Vermillion, 1994; Vermillion and Sagardoy, 1999; Meinzen-Dick *et al.*, 2002). Though this is important and it is acknowledged as a crucial point that needs to be better facilitated by government, it is equally important to understand internal power differentials amongst community members and reform beneficiaries to implement reform processes. If the drivers of reform -State officials- are aware, and acknowledge local power dynamics and social organisation of communities, they may foresee possible difficulties and obstacles. This may improve implementation efforts to establish democratic institutions and participatory forums that act as drivers of reform to redress inequity.

In addition, there is a need to question if land and water reforms are the only ways to achieve equity in wealth? State departments may take into account that most people in rural areas or communities do not necessarily identify themselves as farmers (Kemerink *et al.*, 2009; Kwezi, 2010). Moreover, as it has been shown in the case of Amaswazi, beneficiaries were left with no options in the transfer of land and water from the second farm acquired. They had to fulfil DRDLR condition to use resources for commercial agriculture thus avoiding other possible uses and/or benefits for communities. If *successful* standards are limited to commercial agriculture and thus, reallocation of resources is conditioned to that objective, then priority should be placed on facilitating internal conditions to generate a ‘black commercial agriculture class’ that will need water resources to improve farming activities and thus, water reallocation for productive use will be needed.

Nonetheless, to define what is successful and according to whom is a moral ethical question that should be left to possible or future beneficiaries. In either case, land and water reform processes should be seen as spaces to create multiple opportunities or as means to several ends (c.f. Walker, 2008).

Reallocation by itself, entails serious considerations as both resource transfer cases presented in this thesis, along with the structural division of labour characteristic of South Africa’s rural society, show that there are many internal difficulties in transfer cases that still need to be tackled to achieve successful reallocations of resources. Thus, this questions the suitability of further water reallocation in the catchment. In questioning this, it is not intended to state that reallocation is not needed, as shown elsewhere in this thesis, communities suffer from water scarcity and/or have a water infrastructural deficit that undermines their access for productive water use. Rather, it is hoped that resource transfer processes acquire more attention to improve the understanding towards land and water internal institutional and management difficulties faced by communities.

6.5. Conceptual reflection and recommendations

6.5.1. Conceptual reflection

The analytical framework presented in chapter 1 was built with the assistance of diverse but complementary concepts. Conceptual reflection is now given to discuss whether the presented concepts fit the analysis of complex sociotechnical relations, institutions and institutional arrangements in the field.

To analyse sociotechnical relations and the different strategies and organising practices of commercial farmers, the actor oriented approach and the sociotechnical approach were used. Within these approaches, the concept of water control, power and agency were used in the field as they helped the researcher to anticipate and link access to water and infrastructure, relations of power, decision making. This was important as it improved the clarification of the 'big picture' and the understanding of commercial farmers practices.

The concept of actor network theory (ANT) was specifically useful with the analyses of the relations between the creation and development of infrastructure by commercial farmers and how these shaped social relations and power. Thus, this concept was particularly useful with the analysis of the construction of the Mtsugwana dam in which water systems were changed, but also relations of power and hydraulic property were changed. Thus, the case was able to show that humans and objects are in effect related and infrastructures do change relations of power and control within social systems.

As the thesis was focused on processes, the concepts of sociotechnical and politico-institutional control helped to understand why and how processes take certain directions and not others. This was also linked with concepts of legal pluralism that explain that different legal orders are used to favour specific interests and objectives. Thus, I believe both concepts, power which is implicit in sociotechnical and politico-institutional control, with concepts of legal pluralism were sufficient to understand social processes and outcomes such as the ones that this thesis aimed to understand.

The concepts of legal pluralism were particularly important in the understanding of the different institutions present in communities. Implementation processes have been unclear and thus, difficult to understand. Thus, concepts of legal pluralism were particularly useful to understand why certain actors that represent certain institutions in communities used certain regimes of representation (discourses) and advocate for specific authorities and norms (c.f. Zwartveen *et al.*, 2005).

In general, I believe that concepts used recognize institutions, as dynamic arenas were different social actors meet. It is assumed that institutions may break down but can also be re-arranged (or recreated). An important feature of the sociotechnical approach was that it allowed the understanding of the origins of power relations within time -history- and space. In other words, it argues that sociotechnical relations of power and power regimes are actively shaped and re-designed according to new contexts. The findings of this thesis have proved that indeed, this has been often the case. This proves that water control in the research area is highly dynamic.

The thesis' strategy focused on data collection in the field, and it is only the information that has been made available by the fieldwork that has been taken in consideration. This has been

contrasted with literature review, IBs documents, minutes and historical and anthropological studies according to necessities of the cases. As land and water reforms are most of all driven by the government, government officials were also interviewed to contrast information and analyse their perceptions and strategies on the matter. Nevertheless, as the main focus was to understand reform implementation processes, difficulties, challenges and its outcomes in concrete realities, significant attention was given to this part, thus not sufficiently attending other documentation that may have complemented and better supported information and/or helped to understand implementation process and land transfers.

6.5.2. Recommendations

The cases of land reform presented in this thesis were a challenge to understand for the author. Reform has been implemented in divergent ways in both cases. Exception to the rule is the main feature and formal institutional arrangements are interpreted and circumvented in multiple ways by different actors. This creates difficult to understand what is happening on the ground. It also suggests how difficult it must be for local actors that have little education backgrounds to understand what is happening in their own land and why. In consequence, it is highly recommended to improve transfer of information and communication between State authorities and all actors, even if they do not form part of the committee members or other institution in charge of management. This is important because informed beneficiaries may pose less aversion to change or on the contrary, it may be easier for them to support certain decisions and not others if they are aware and understand what is happening. This may contribute to institutional management and/or diminish local conflicts.

Further research on the case of Potshini might be needed. It remains unclear for the author how the land officially restituted to a land claim community that subsequently organised themselves as a legally recognised entity (the grazing land committee), still ends up as a legally recognised form of commonage that falls under the jurisdiction of the municipality. This may still be a matter of further investigation.

Hydrological data for the Thukela WMA is available and/or has been studied by DWA. In the same way, it is also available in general for the Little Thukela catchment. Nevertheless, two issues are noted: First, local requirements have been calculated according to the compulsory registration process that took place in 2000. At that moment, as explained in chapter 3.4, commercial farmers strategized, and the registered water not necessarily coincides with actual use. In addition, other requirements like the use of local communities were not taken into account. Second, according to the ISP report of DWA, local requirements exceed the local yield by 30 million m³ per annum. In contrast, other consultancy reports (see annex 5) say that MAR (mean annual runoff) to the confluence of the Lindequespruit with the Little Thukela are 262 million m³ per annum. It is thus noted that a new water registration should take place and communities and other users should be included in the estimation of local requirements. In addition, it is noticed that overall data for the Little Thukela is available but it is clear that as the catchment has been already over-allocated to commercial farmers, water resources are not even available for them and thus, water registration and distribution of rights has *not* happened in the past according to water availability. Thus, better hydrological information of the whole catchment, but also of the different streams and rivers of the catchment should be available to support future distribution of water resources and management.

Processes of institutional water reform should be better facilitated by DWA. As it has been explained in chapter 5, institutional reform is not just a matter of adding HDIs to an already organised process. Members have to be better accompanied to the process and involve in the whole casting of the WUA. In addition, a difference of inclusion and representation seems to be needed, as HDIs members have been selected by their colour of the skin or sex and not necessarily according to their water use. Though it is argued that they are representing the emerging sector, neither of both is or considers him/herself as an emerging farmer. More attention is needed to this and to the crafting of the MANCO as the future opportunities to gain access to water by HDIs may depend on its establishment.

Finally, coordination is needed between State departments. As it has been argued in this thesis, water reform depends on land, infrastructural and institutional reform to be achieved. So far, State departments have been working each one by its side, without coordinating projects and reform together. Because of this, it is easy to find cases like Amaswazi in which land and water has been transferred yet, beneficiaries are not even aware they have to register water under their new name, that they have to pay levies, and even State departments -in this case DWA- is not aware of the water reallocation. To avoid chaotic implementations and more difficulties to new beneficiaries, this coordination is urgently needed.

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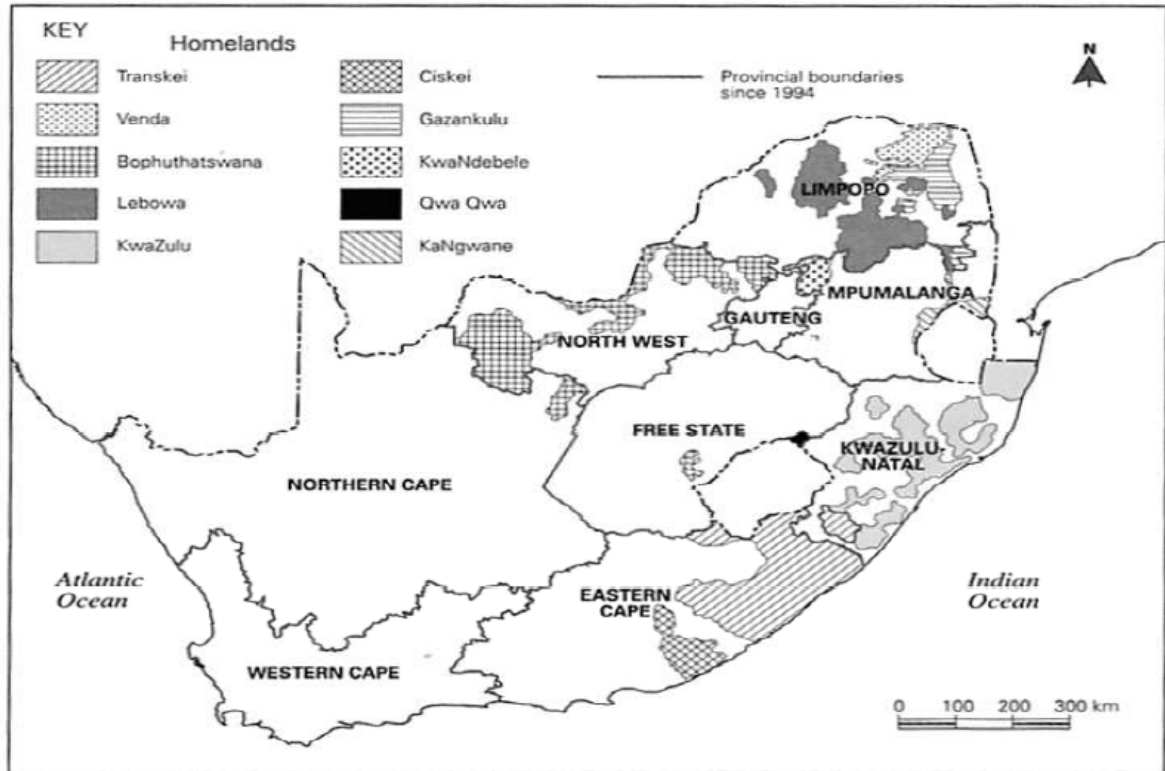
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Annexes

Annex 1. Map of the Republic of South Africa. Source: Geology.com (2007).



Annex 2. Former Bantu areas. Source: Gervais-Lambony (1997).



Annex 3. Rainfall of the Thukela catchments by region.

Source: Schulze, R.E., Dlamini, D.J.M. and Horan, M.J.C. 2005. The Thukela Catchment: Physical and Socio-Economic Background . In: Schulze, R.E. (Ed) *Climate Change and Water Resources in Southern Africa: Studies on Scenarios, Impacts, Vulnerabilities and Adaptation*. Water Research Commission, Pretoria, RSA, WRC Report 1430/1/05. Chapter 10, 191 - 209.

Table 1. Monthly and annual statistics of rainfall (mm) in the Mountain Region

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Mean	200.0	184.1	176.6	69.7	23.5	9.3	10.9	35.5	57.8	96.2	144.7	187.6	1195.7
St. dev	82.6	92.8	101.4	44.1	31.1	15.6	17.7	41.0	74.2	53.0	81.9	84.8	308.3
% C.V	41.3	50.4	57.4	63.3	132.5	168.1	161.6	115.6	128.5	55.1	56.6	45.2	25.8
Driest in 10	121.5	78.9	64.3	20.0	0.0	0.0	0.0	0.0	10.9	49.7	51.0	96.1	845.5
Median	184.4	171.1	157.8	63.3	12.4	3.0	1.9	21.5	32.8	85.3	141.0	171.9	1232.7
Wettest in 10	326.3	315.9	311.5	115.7	63.1	31.4	29.8	94.4	127.4	163.6	221.0	279.4	1558.2

Table 2. Monthly and annual statistics of rainfall (mm) in the Highlands Region

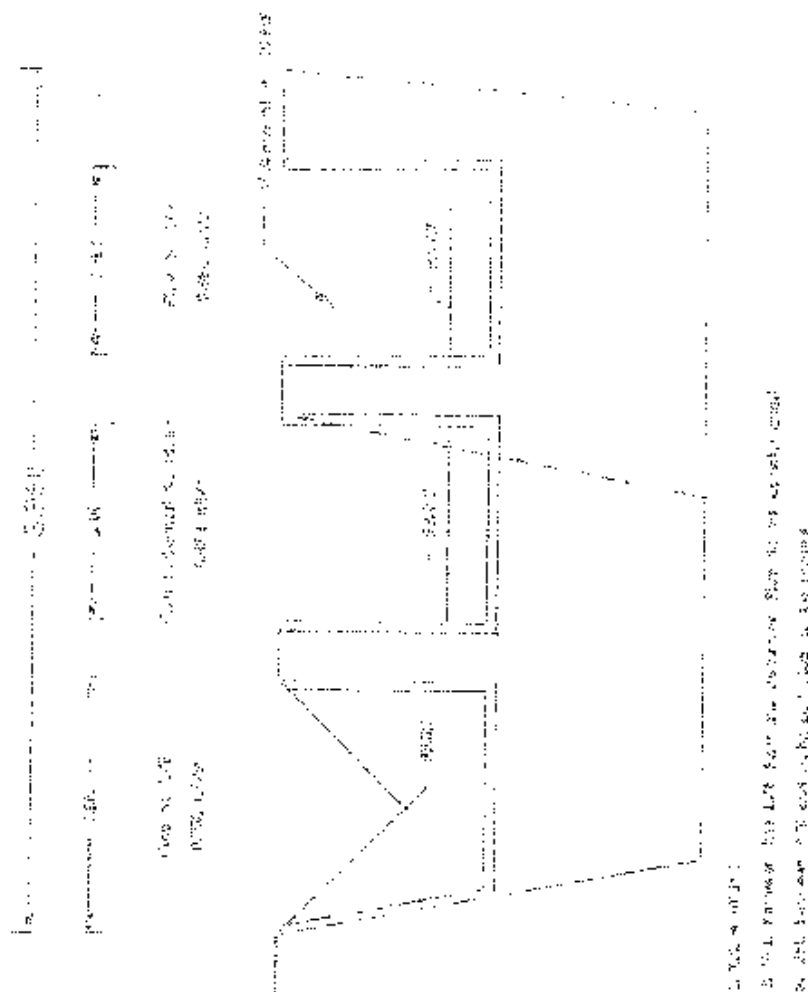
	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Mean	144.3	111.8	109.5	55.3	17.7	10.6	10.1	30.4	47.1	69.9	137.2	143.3	887.2
St. dev	58.4	54.0	53.6	31.9	22.5	22.0	13.6	30.5	56.9	35.5	63.5	60.4	176.2
% C.V	40.5	48.3	49.0	57.6	127.2	207.0	134.4	100.6	120.8	50.8	46.3	42.1	19.9
Driest in 10	74.9	40.5	52.7	15.7	0.0	0.0	0.0	0.0	8.9	29.0	61.7	67.2	667.2
Median	143.6	105.6	98.7	51.0	8.3	1.3	2.5	17.8	24.6	63.2	124.8	142.4	885.2
Wettest in 10	221.1	191.8	173.1	90.0	56.3	28.3	34.2	83.7	106.6	121.8	232.3	208.0	1117.1

Table 3. Monthly and annual statistics of rainfall (mm) in the Interior Basins Region

	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC	ANN
Mean	137.5	107.4	85.1	39.7	16.1	6.6	7.9	19.0	40.3	86.6	113.5	135.6	795.3
St. dev	71.9	63.3	45.1	28.1	20.1	9.9	16.1	20.4	46.0	53.4	53.7	76.3	162.2
% C.V	52.3	58.9	53.0	70.9	125.2	149.5	203.9	107.1	114.0	61.7	47.3	56.3	20.4
Driest in 10	56.7	25.1	31.1	0.3	0.0	0.0	0.0	0.0	1.1	27.2	50.7	53.8	587.0
Median	143.0	100.9	81.9	39.0	8.9	0.8	0.0	14.1	31.2	73.2	114.8	128.1	821.9
Wettest in 10	226.6	198.7	148.0	87.1	43.5	23.2	21.0	48.9	79.8	160.5	189.2	236.7	991.6

Annex 4. The division of Little Thukela river between the big and small canal and the river.

Division of Long Dam by Little Thukela River



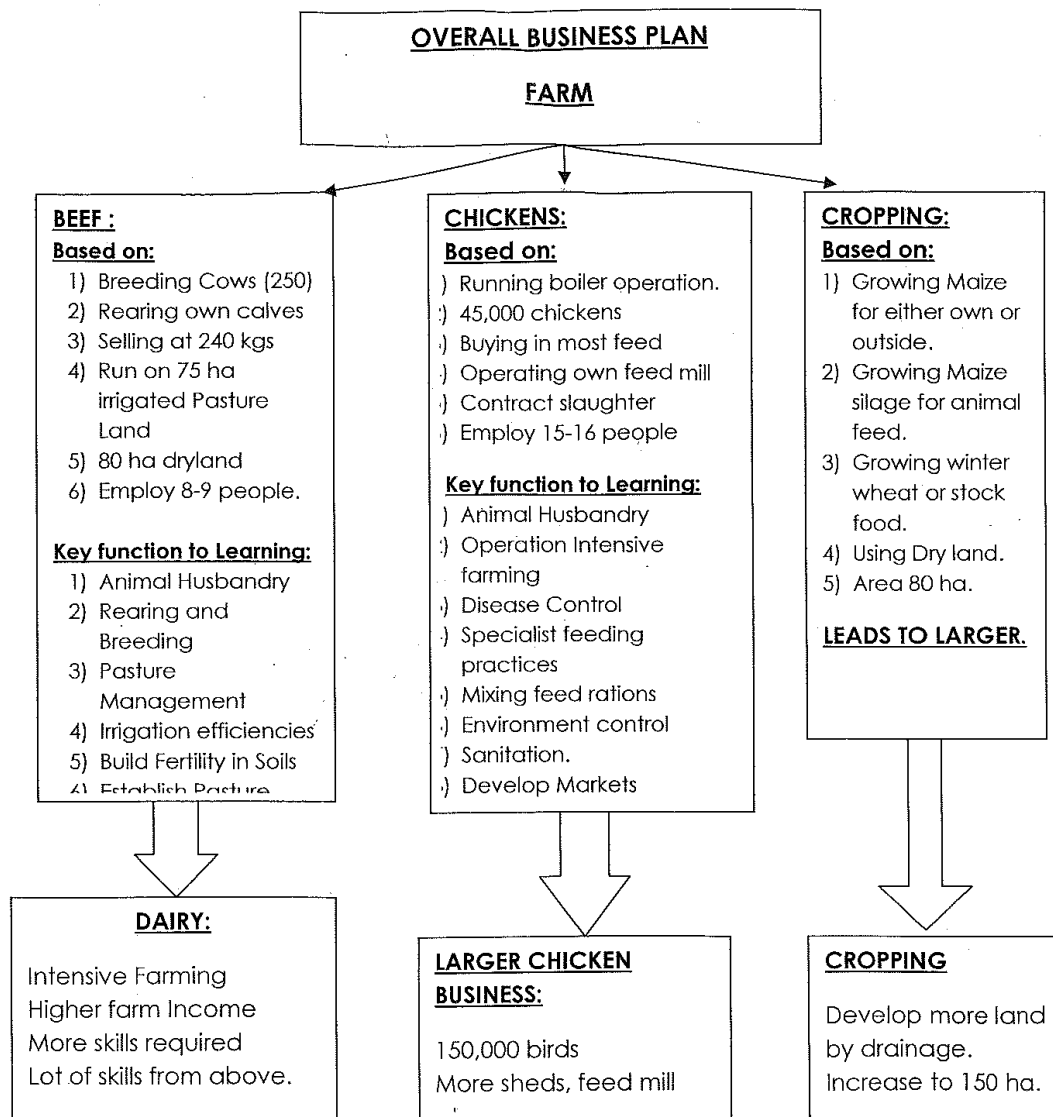
Annex 5. Overall Water Resources study by the MBB consultancy for the construction of the Mtsugwana dam.

<u>Overall Water Resources</u>				
A <u>First Analysis</u>				
<u>Winter Irrigation</u>				
Assume driest 4 months				
<u>Runoff (driest 4 months)</u>				
MAR to Lindequespruit confluence				262 mil m3
<u>Average year</u>				
Runoff (driest 4 months)	6.6% MAR	=	17.3 mil m3	
IFR (as per detailed analyses)			4.2 mil m3	
Net runoff				13.1 mil m3
<u>1 in 5 dry year</u>				
Runoff (driest 4 months)	2.5% MAR	=	6.6 mil m3	
IFR (as per detailed analyses)			4.2 mil m3	
Net runoff				2.4 mil m3
<u>Irrigation demand</u>				
5752 ha @ 400 mm		=		23.0 mil m3
<u>Storage details</u>				
	cap		est area	
Bell Park	7.5 mil m3		1,400,000 m2	
Off channel Upper Little Tugela	3.95 mil m3		400,000 m2	
Off channel Lower Little Tugela	2.295 mil m3		250,000 m2	
Heartsease	5 mil m3		850,000 m2	
Msukwane	3 mil m3		370,000 m2	
Totals	21.745 mil m3		3,270,000 m2	
<u>Storage losses</u>				
Annual evaporation				1350 mm
Evap estimate March to Sep		=	53% annual evap	
			716 mm	
Ave pan factor			0.85	
Lake evap			608 mm	
Annual ave rain @ 100%			976 mm	
Rain March - Sep 31%			300 mm	
in a dry year, say 60%			180 mm	
Net lake evap			428 mm	
On all dams, evaporation losses			1,400,839 m3	
For other losses add 20%			280,168 m3	
Total losses			1,681,007 m3	
			1.68 mil m3	
<u>Balance</u>				
<u>Average year</u>				
Balance			10.15 mil m3	i.e. a surplus
<u>Dry year 1 in 5</u>				
Balance			-0.59 mil m3	i.e. a shortage
<u>Second analysis</u>				
(Not entirely accurate but is an indication)				
From detailed model 1 in 5 year drought				
Existing storage			13.75 mil m3	
Storage shortfall at Lindequespruit Confluence			14.9 mil m3	
But this includes shortfall at Bell Park				
(which is not considered realistic by users)			4.7 mil m3	
Net storage			10.2 mil m3	
New storage			8 mil m3	
Shortfall in 1 in 5 drought			2.2 mil m3	

Annex 6. Pre and post Mtsugwana dam water allocation sheet.

Total HA. Scheduled	L.T.I.B.			W.I.S.B.		New Dam		
	Sub 1 Ha.	Sub 2 Ha.	Sub 3 Ha.	Sub 2 Ha.	Sub 1 Ha.	Sub 2 Ha.	Sub 3 Ha.	Sterk Ha.
27.26				27.26		7		87
25.41				25.41		11		157
34.71				34.71				40
77.92				77.92		110		47
83.88		23		60.88				150
0								
12.23				12.23		160		
31.79				31.79				20
0								
0								
90.6		18		72.6		50		15
0								
56.6				56.6		113		259
130				130				30
4.27				4.27				10
35	35					60		50
38.13		5		33.13		10		66
2	2							
100	100				20			
0						80		
186	186				60			
21.13				21.13				
4.35				4.35				
121.77				121.77		80		
20			20					
0								
0								
10				10		21		
82.32		57		25.32		50		
53.01				53.01				
27.61				27.61				
5	5							
5	5							
15	15							
12.53				12.53		15		
164.57		70		94.57				
5	5							
35.64				35.64				
0								
90	90				26			
288	288				157			
130	130				30			
120	120				30			
15			15					
5	5							
46			46					38
165.6		16		149.6		226		
32	32				76			
510			510					85
40			40					40
25.05				25.05		2		
10	10							
43.61		14		29.61				
92.85		37		55.85		38		
0								
120	120				20			
44	44							
40.85				40.85				
74			74					25
74			74					25
50.42				50.42		10		
3.68				3.68		1		
32.8				32.8				
120	120				30			
1361		1361						
3691.59	1312	1601	779	1360.59	449	1025	213	931

Annex 7. Smahla Land Trust Business Plan.



Annex 8. Smahla Land Trust property.

