



MONASH University

Ruling the Game of Institutional Water Governance

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An analysis of water access, power and control
in South Africa

By

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ABSTRACT

The post-Apartheid water policy framework of the first democratically elected government in South Africa was centred on the political vision of overcoming past racial inequalities in water access. With the National Water Act 1998 and the National Water Resources Strategies, the new government answered the question of how to govern water resources more fairly in everyday practices with a formal institutional strategy of regional and local level water governance.

The devolution of water management authority to subsidiary Catchment Management Agencies on provincial level and Water User Associations on local level was an essential part of this strategy while adopting ideas of collaborative governance and Integrated Water Resources Management.

This thesis examines how this political vision has transpired into everyday realities of three water user groups' livelihoods in two study areas in two Provinces of South Africa. It critically investigates through which mechanisms local people access water and how the involved processes align with their complex social relations with other people's lives and livelihoods within the South African context of socioeconomic inequality and high poverty levels.

Using a qualitative multi-sited case study approach, this thesis involved over 100 participants traversing societal micro and macro levels. In the research process I engaged with government actors, the recently established regional and local water institutions, consultancies, as well as academic research institutions, while the majority of research participants came from the three water user groups of large-scale white commercial farmers, black upcoming (so called emerging) farmers and the rural and urban poor.

The empirical findings reveal that opposite to what the new water legislation had promised, the newly established institutions were rather a formal platform entrenching privileged access of South African commercial farmers to water for economic purposes in practice, instead of breaking it. Arguing that this institutional approach was ill suited for transporting the normative political vision into everyday livelihood realities, this thesis finds that power asymmetries between the involved actors are the core explanatory factor to understand how different actors played the game of water governance to their benefit.

Drawing on social and critical institutional theory, but mainly applying theories of power, this thesis unmasks supposedly collaborative decision-making processes in local level water governance institutions, highlighting the chasm in South African water governance between structural factors of policy and legislative frameworks on paper and agential factors in practice. This research concludes that water access in the two study areas, regardless of whether for large-scale agribusinesses or small-scale subsistence farmers, is subject to power plays and still highly unequal favouring the old agricultural elites.

As over ninety Water User Associations have been established in South Africa to date, and more are to come, the findings presented in this thesis have societal relevance for future water policy implementation the country, and elsewhere.

DECLARATION

This thesis contains no material which has been accepted for the award of any other degree or diploma at any university or equivalent institution and that, to the best of my knowledge and belief, this thesis contains no material previously published or written by another person, except where due reference is made in the text of the thesis.

Signature:



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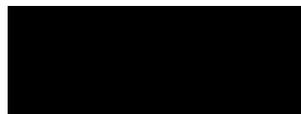
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The undersigned hereby certify that the above declaration correctly reflects the nature and extent of the student's and co-authors' contributions to this work. In instances where I am not the responsible author I have consulted with the responsible author to agree on the respective contributions of the authors.

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LIST OF ABBREVIATIONS

ANC	African National Congress
Cbm	Cubic meter
CF	Commercial Farmer
CMA	Catchment Management Agency
CMF	Catchment Management Forum
CSIR	Council for Scientific and Industrial Research
CWM-WMA	Crocodile (West) – Marico Water Management Area
DFiD	Department for International Development (UK)
DWA	Department of Water Affairs
DWS	Department of Water and Sanitation
EF	Emerging Farmer
HDIs	Historically disadvantaged individuals
IDP	Integrated Development Plan
ISP	Internal Strategic Perspective
IMF	International Monetary Fund
IWRM	Integrated Water Resources Management
MAR	Mean Annual Runoff
MSA	Municipal Structures Act
n.d.	not dated
NWA	National Water Act 1998
NWP	Northwest Province
NWPR	National Water Policy Review
NWRS	National Water Resource Strategy 2004

Pers. comm.	Personal Communication
Pers. obs.	Personal Observation
RSA	Republic of South Africa
SA	South Africa
SATI	South African Table Grape Industry
SANP	South African National Parks
SLF	Sustainable Livelihoods Framework
UN	United Nations
WSGD	Strategy for Water and Sustainable Growth (of South Africa)
WMA	Water Management Area
WRC	Water Research Commission (of South Africa)
WRM	Water Resources Management
WSA 1997	Water Service Act 1997
WSA	Water Service Authority
WSP	Water Service Provider
WUA	Water User Association

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CHAPTER 1 - SETTING THE SCENE OF THE GAME

In South Africa, water for irrigation purposes is key to local production systems and crucial to sustaining the livelihoods of large-scale commercial farmers, smallholder irrigation farmers and small-scale subsistence peasants in rural communities alike, although in very different ways. The control of and access to water are therefore key to local livelihoods, national food security and social development (Mollinga 2000; Msibi and Dlamini 2011).

Since the end of the Apartheid regime (1948-1994), the South African government has introduced a governance framework to address past, current and future challenges of water. This is because the policies of societal segregation of the white South African Apartheid regime in which race, gender and class were the dominant factors, also shaped water access in the country (Tapela 2012). Accordingly, water access was highly unequal (Laube 2008). A white minority of European descent controlled the water resources and almost no black men, let alone women, used water for non-subsistence productive purposes or had any formal water entitlement (van Koppen et al. 2011). Besides a lack of access to water for economic agricultural purposes, black people had only very limited access to water for subsistence livelihood purposes. As a result, “at the dawn of democracy, an estimated 12 million black people did not have access to safe water, and around 20 million did not have adequate sanitation - this of a population in the order of 36 million people” (ibid., p. 2). This historical background provided the context for the new water governance framework of law and policy in post-Apartheid South Africa.

With the 1998 National Water Act and other legislative packages, the South African government initiated an in-depth reform process of water resource governance to tackle the country's water challenges. The three main conceptual domains of South African water governance are equity, efficiency and environmental sustainability (National Water Resources Strategy 2; conf. also Jonker et al. 2010). Sustainability relates to a growing understanding in South African political spheres of decision-making of the deep interdependency of humans and natural ecosystems (Roux 2011). Efficiency relates to the fact that with an average annual rainfall of 475 mm - a rate well below the world's average of 860 mm - South Africa is a water scarce country, in which the prudent use of water for economic purposes is crucial (Laube 2011). Additionally, a high intra-annual and spatial variability of precipitation increases the need for efficient governance mechanisms for surface and groundwater resources (Asmal 1998; Turton et al. 2003). Equity in particular links to improved access to water and its livelihood benefits for those historically marginalised by the racial policies of resource access under the Apartheid regime (DWS, National Water Act 1998).

The 1994 government has answered the question of how to govern water resources more fairly with an institutional strategy of regional and local level water governance. Following the ideas of the dominant paradigm for water management - Integrated Water Resources Management (IWRM) - the devolution of water management authority to subsidiary Catchment Management Agencies (CMAs) at the regional level and Water User Associations (WUAs) at the local level was an essential part of this strategy (DWA 2004a). The implementation of this institutional structure was supported by a set of national laws and regulations governing socio-political processes of establishment and operation of the new institutions. This approach envisioned to contribute to a “sustainable use of water for the benefit of all users” (DWA 1998, National Water Act of South Africa 1998). The latest National Water

Policy Review (NWPR 2013) of South Africa set the goals of this policy as: “reduction of poverty and inequality across the country and that the water needs of poor communities are met and protected to support the development of sustainable livelihoods” (DWA 2013, NWPR 2013 p. 9; see also Schreiner et al. 2002). In the policy statement, sustainable livelihoods refer to the means of making a decent living, producing food and earning an income to support themselves and their family in ways that meet their basic needs and maintain a healthy living environment (Chambers 1997). The South African legislation thus acknowledged in their political strategies the importance of the intrinsic connection between the access to sufficient amounts of safe water and the ability to pursue an active livelihood (Kulindwa and Lein 2008).

This thesis is located within the equity domain of South Africa’s water governance framework investigating the connection between the lives and livelihoods of three water user groups and how they relate to access to and control over water for productive purposes through a WUA or other formal mechanisms in the absence of a WUA.

Access to water is central to the socioeconomic development of any society (Swyngedouw 2002). In South Africa’s economy the largest user of water is the commercial and largely export-oriented agricultural sector consuming approximately 65 % of the total water available for human usage (PMG 2016). But on a societal micro-level of South African communities, families and households, access to water for drinking and productive purposes is crucial for basic food and livelihood security and for socioeconomic development through small-scale communal projects and subsistence food gardening. In other words, a highly developed, water-intensive agricultural system exists side-by-side with poor rural communities and villages, informal settlements, with oftentimes limited access to water infrastructure, physical water, as well as sanitation facilities. Therefore, the political organisation of water access and the actors and institutions involved in water governance processes play a key role in South Africa’s water policy for delivering future water security at all levels.

Combined with large income disparities and other socioeconomic asymmetries between rich and poor (Swatuk 2008), this makes South Africa one of the most unequal societies on the globe with the world’s highest Gini coefficient¹ of 0.63 in the 2013 Human Development Report of the UNDP. Twenty years after the end of the Apartheid regime, for many South Africans (mainly the urban poor and rural poor) having constant access to water for human consumption, water for sanitation and hygiene, but especially for productive uses such as subsistence agriculture, has remained an aspiration, but has not become a reality yet (ibid.).

¹ There are different ways of expressing inequality. Quantifying it relative to income and wealth distribution, as the Gini index does, is one way to exemplify the vast discrepancies between those who have and those who have not. It is measuring the deviation of income distribution among households and individuals within one country from what is considered as a completely equal distribution. A value of 0 represents such absolute equality, whereas a value of 1 presents absolute inequality. South Africa’s value of 0.63 given here is pre-tax and pre-social service transfers (HDR 2013).

In line with the above, the control of and access to water resources remains one of the most pressing topics in today's South Africa. Water protests (and overall service delivery protests) break out regularly, especially in informal settlements, semi-urban neighbourhoods and rural areas (Förster et al. 2017; pers.obs.).

At the heart of South Africa's strategy to address these challenges lies its formal approach to water law and policy. Key elements are an emphasis on achieving greater equity concerning water access, which is expressed in the country's national water and sustainability policy and the idea of redressing past inequalities through an institutional mechanism of supposedly inclusive and collaborative water governance on the local level, the Water User Association. These are described in the National Water Act 1998 as "cooperative associations of individual water users who wish to undertake water related activities for their mutual benefit" (National Water Act, NWA 1998). Through negotiated and deliberative processes within newly established local Water User Associations the access to and control over water for productive purposes was anticipated to be "radically transformed" (National Water Policy Review, NWPR 2013). WUAs were thus framed as a vehicle for transforming water access through fostering more democratic decision-making over water related issues bringing together all local water users, whether they have a formal water entitlement or not (Seshonka 2004). The National Water Management Strategy of South Africa (NWRS 2, p. 61) constitutes the purpose of WUAs as to "effectively manage local water resources for the common interest of their members, particularly for historically disadvantaged groups." This mainly relates to water for economic purposes of mostly large-scale irrigation.² However, participation in collaborative decision-making processes and a shared control over water resources were thought to have a developmental and empowering character targeting the black majority of South Africans previously excluded (NWPR 2013). The Water User Association was envisioned as a central vehicle for improving the livelihoods of the poor (Goldin 2008; Jonker 2014). Besides the idea of participation and collaboration in matters of water, the DWS had prioritised the representation of water users in local and regional decision-making structures of newly established formal institutions; a transparent access by water users to information; and to provide accountable institutions which would govern water to the benefit of all users (NWA 1998; NWSA 2004). In other words, water policy in South Africa conforms closely with ideas of sustainable development and good governance through local level institutions and the application of sustainability to water resources development articulated by the UN, the OECD and other international developmental agencies in the Sustainable Development Goals.

² The South African Water Services Act 2004 and the Municipal Structures Act have mandated local municipalities with the provision of drinking water and sanitation services. But many South African municipalities do not have sufficient financial resources and human capabilities to fulfil this mandate of being the Water Service Provider (WSP). In some cases this resulted in WUAs providing water to municipalities or even directly to water consumers, becoming the WSP in practice, while the municipality on paper remained the Water Service Authority (WSA) paying the water service provider for the bulk water provisions. However, the quality of the water delivered depends on the specific constitution of the WUA. In many cases it only stipulates for irrigation water, but not for water complying with South African standards for drinking water.

However, the institutional implementation of South African water policy faces serious shortfalls and backlogs (Schreiner 2013), with little substantive progress on the goal of transforming water access for productive purposes being made within the last 18 years, especially for agricultural smallholder irrigation schemes of the poor and historically marginalized (Swatuk, 2008; Schreiner 2013; Jonker 2014, pers. comm.).

Despite national and international researchers engaging with this matter, their quest to find answers for the lack of change in water access has in many instances produced similar explanations: the slow pace of policy implementation is due to limited financial resources and human capabilities of the South African government structures to 'do the job' (see for example Schreiner 2013). This is certainly a valid finding and one I will empirically support in the following Chapters of this thesis. Nevertheless, rarely have studies dived into the social realities on the ground and in the watershed, into the context³ in which institutions of natural resources governance are often described to be 'embedded' (Merrey et al. 2007; Goldin 2013). Seeking explanations for the copious challenges the South African government is facing to establish the new water institutions and to make them work in practice in the social, economic and political contexts is an angle rarely taken up by scholarly research on South African water governance. As such, an often overlooked notion is that WUAs were anticipated as vehicles for changing access and control of water to provide the initial conditions for socioeconomic development⁴ of the black and colored population; they thus were envisioned to facilitate a new water society by introducing a set of formal principles and rules anticipated to elicit a desired change. The post-Apartheid water institutions such as Water User Associations were normatively 'designed' as institutional platforms to overcome generation-long patterns of racialized water access and control. In other words, they were designed to enable participation, water user collaboration and anticipated as to empower black farmers in decision-making about water. This, I will critically examine in the following Chapters.

This research had set out with the goal to gain an understanding of how WUAs operate and if, how and why they were an appropriate vehicle to carry the normative political vision to "radically transform" (DWA 2013) access and control over water for productive purposes for the historically disadvantaged black population into everyday practices of water governance.

³ Context in this thesis is defined borrowing the definition of the Cambridge dictionary (web-based version, 2017). In this definition the context is understood as a causal element contributing for something to happen: context is "the situation within which something exists or happens, and that can help to explain it".

⁴ Admittedly, socioeconomic development is influenced by many factors outside the water domain. However, Kulindwa and Lein (2010) and Mollinga (2000) rightfully point out that especially for the rural and urban poor, access to safe and clean water for drinking, household purposes and sanitation and hygiene are the basic requirements for a decent living and thus also for economic advancements. Furthermore, for millions of South Africans mostly in rural areas, water for small-scale agriculture to produce a basic food supply the crucial importance of access for survival becomes clear (Backeberg et al. 2006).

A first empirical hint of how to possibly answer this question I found talking to a senior official from the national Department of Water and Sanitation (DWS) in South Africa, responsible for institutional governance. As a key informant of this research, he told me that, “Water User Associations are not working, because the white guys are still dominating”. This statement was recorded after the first round of data collection in 2014 and thus indicated rather early in this inquiry that power relations were at the heart of the research problem. That the institutional architecture of WUAs was not working as anticipated is also a well-established finding in scholarly literature (Faysse and Gumbo 2004; Benedict et al. 2009; Orne-Gliemann n.d.; Kemerink et al. 2011, 2013). Yet, it is a phenomenon less explored empirically. Testing the above assessment of the official of the DWS against the empirical findings from two case studies in two South African Provinces is the main task of this thesis. Accordingly, this statement has become the underlying research problem and a central theme for this investigation.

Accordingly, I aim to provide empirical answers to the question of how and why “white guys are still dominating”, i.e. how power manifests itself in processes within WUAs and which internal and external factors influence this. As the South African water policy reform specifically set out to improve water access for agricultural purposes of the poor and historically disadvantaged, I investigated processes of Water User Association establishment and operation from the perspective of those governed, through the lens of livelihoods of local water users. I thus shift the investigative focus of emphasizing structure-based perspectives of policy and law and formal institutions too often employed as an explanatory level for a limited efficacy of South African water governance, towards incorporating an actor-based perspective highlighting the crucial need to understand the processes and contexts of people’s livelihoods. In line with this, I will critically ask the question for whom are the WUAs working effectively and for whom they are not, and offer an explanation of why that is the case. Analytically, the Sustainable Livelihoods Framework, institutional theory and governance thinking, as well as social theory and theoretical approaches to power provide an appropriate eclectic lens to study how the livelihood contexts of local people manifest in power relations, which shape processes of accessing and controlling water through formal institutional mechanisms.

This research therefore critically analyses how three different groups of actors (large-scale commercial farmers, black upcoming small-scale farmers [so called emerging farmers] and members of poor communities) access and control water for productive purposes through the institutional mechanisms of WUAs and possibly other relevant formal and non-formal mechanisms enabling water access and how those processes relate to their livelihoods. Using the research strategy of a qualitative multi-sited case analysis, I explore how power relations manifest in institutional processes of water access and control while explicitly taking into account the realities of local people’s lives and livelihoods. Accordingly, this study was designed to provide evidence-based recommendations for the future of WUAs in South Africa. However, the findings presented in the following eight Chapters also bear relevance for policy strategies involving local-level natural resource governance institutions elsewhere in the world.

1.1 RESEARCH NICHE

This socio-political⁵ side of everyday water governance through local actors in local institutions is under-emphasized in both international literature and political strategies to implement water governance institutions at regional and local levels (Biswas and Tortajada 2010). There has been little research on whether Water User Associations (WUAs) serve as effective mechanisms for increasing water access and control by marginalised people in South Africa. This is especially true when it comes to the actual localised everyday decision making processes over water for productive purposes within formal institutions (Meissner et al. 2013). Indeed, in the water and sustainability literature, it is often taken for granted that these institutions provide the ‘best’ mechanism for participation, representation, stakeholder collaboration, shared decision-making and empowerment of local people (Mollinga et al. 2010).

WUAs are the local unit within the institutional structure of South African water governance (Herrfahrtd-Pähle 2010). Most South African WUAs mainly supply water to large-scale users, such as commercial agriculture, but in some instances they also directly deliver water to municipalities and households in residential areas (Senior water resources manager Breede-Gouritz CMA, September 2014, Worcester). This includes informal settlements, households in small towns, as well as residents of better situated areas like large farm estates, for example. Thus, WUAs play a crucial role in local people’s livelihoods regarding access to water (Förster et al. 2017). They are also central to the development goal of improving water access opportunities for those historically marginalised (Quibell et al. 2012; Jonker 2014 pers. comm.).

This makes it important to investigate the question of whether WUAs present an appropriate mechanism to support the improvement of water access of the poor through deliberative mechanisms of participation and collaboration in formal institutions. The social processes around the decision-making among water users within WUAs are poorly understood in current international and South African research-based literature (Meissner et al. 2013; Kemerink et al. 2013). Moreover, a systematic investigation of power relations in and around water governance institutions anchored in the results of a theory-informed case study is lacking (Biswas and Tortajada 2010).

Further significance of this research stems from the practical fact that in South Africa only two CMAs to date have been given operational status, but more than 90 Water User Associations have been established (DWS n.d.) in different Provinces of the country. Despite the practical importance of WUAs in contrast to CMAs, international and South African scholarly literature on the institutional

⁵ Socio-political in this thesis describes the interaction of the social sphere and the political sphere in practice. It means that a social action or social interaction between actors in accessing and controlling water is, in principle, shaped by the underlying rules made by political representatives, which were mandated in a democratically organised state by the vote of the state citizens. Broadly speaking, socio-political means social action within the formal boundaries of policy, law and regulations. Consecutively, also use the term socioeconomic in this thesis. This serves to point out that everything is social. Without people our economic systems wouldn’t function; there would be no politics and no institutions. Using the term ‘social’ before ‘political’ or ‘economic’ highlights this (see also Archer 2000).

implementation of South Africa's water policy to a large degree has focussed on Catchment Management Agencies (Meissner et al. 2013; Karar 2014 pers. comm.), rather than focusing on the local level of WUAs. Within previously published research, the main emphasis was to a large degree put on the normative institutional design of how CMAs were supposed to be established, how they would operate within the nation-wide institutional arrangements, and also on what they were designed to achieve, instead of on how they would actually operate in practice⁶ (Jonker et al 2010; Meissner et al. 2013). Similarly, the relatively small amount of international literature on WUAs in South Africa covers the challenges of establishment and everyday operation only to a very limited extent, not theoretically diving into the heart of the matter⁷ (for example Faysse and Gumbo 2004; Seshonka et al. 2004).

Therefore, a theory-informed in-depth analysis of how exactly power manifests itself in and around WUAs and shapes characteristics of water access is lacking. *In* WUAs here means for example the rules and processes of becoming a member, decision-making and the assignment of voting rights, and ultimately, the physical distribution of water. *Around* WUAs emphasizes that local institutions of water governance cannot be analysed without incorporating the complexity of everyday social life. WUA establishment and operation can be best understood as a patchwork result of "historical formations driven by social and economic changes and constants over time, and the interplay between global and local factors, the traditional and the modern, and between formal and informal arrangements"(Mosse 1997, p. 15; see also Cleaver 2007, 2012). Therefore, supported by empirical evidence gathered in two case study areas in South Africa - the Western Cape Province and the Northwest Province - this thesis takes a critical and analytical view of WUAs in policy and practice.

By giving local people's livelihoods and their access to water through the WUA a central position in the analysis, I examine how water governance through WUAs is established and how it operates in relation to local livelihood needs. After all, to create more sustainable livelihoods for those historically disadvantaged was (NWA 1998) and is still (NWPR 2013) a central aim of the Government's water policy (ibid.; Jonker 2014). Contributing to the existing scholarly knowledge on this nexus, this thesis builds upon two detailed and nuanced case studies of social processes grounded in local people's lives.

⁶ Meissner et al. (2013) reviewed 189 international publications including peer-reviewed articles in scientific journals and books, publications from the South African government (including the National Water Act, White Paper, policy documents and guidelines), working papers, conference papers, conference proceedings, as well as masters and doctoral theses and scientific research reports. 119 of them (86%) dealt with questions around CMAs; seven with the Apartheid farmer organization of Irrigation Boards (as institutional predecessor of WUAs) and only nine centred on the topics surrounding Water User Associations.

⁷ More detailed scholarly works on institutional water governance in South Africa and its anticipated developmental effects of improving water access for those historically disadvantaged include Kemerink et al. (2013); Brown (2013); Kemerink et al. 2011; Wilson and Perret (2010) and Orne-Gliemann (n.d.).

1.2 SIGNIFICANCE SCOPE AND OBJECTIVES OF THE RESEARCH

Within these research boundaries, the overall aim of this study was to investigate the institutional game of accessing and controlling water. The mechanisms through which local water users access water for productive purposes, how institutional mechanisms shape that access, and how these processes relate to their livelihoods are central to this thesis. Analysing power relations among the actors involved manifest in this game is necessary for explaining its outcomes. As WUAs in South Africa were anticipated as institutional vehicles for providing improved access to water for productive purposes to those historically deprived, this overall aim is well justified within the South African context (NWA 1998; NWPR 2013).

In order to achieve this aim, research objectives were established as to:

1. explore the overarching water governance structure in South Africa;
2. examine the livelihood context of three water user groups and explore the actors' resources and capabilities;
3. investigate characteristics of establishment and operation of the institutional access mechanism; and
4. provide an analysis of how the three water user groups use their resources and capabilities as sources of power to access and control water.

To achieve these objectives I employed a qualitative multi-case analysis. Using in-depth, semi-structured interviews and focus groups, as well as document analysis, I cross-examined empirical results from two study areas in two South African Provinces. Analysing the formal rules of the game for water access in institutionalised water governance, I present an analytical overview of legal acts and policy documents relevant for the establishment and operation of South African institutional water governance architecture. This contributes to achieving objective one.

Examining the livelihoods context of actors and thus their resources and capabilities allows for exploring the foundations and origins of possible power differences and thus links to objective two and three. In order to achieve objective three I developed a set of criteria for democratic water governance from the existing literature (TARPCO criteria) and utilised it as an ordering framework for the analysis of the findings and organisation of the results Chapter 5 and 6. I introduce these criteria in Chapter 2. Researching how the WUA works in practice, while bringing the findings under objectives one to three into a constructive dialogue with each other, this thesis will contribute to a better understanding of the ways in which power manifests itself within the processes of WUA establishment and operation.

The two cases chosen for this inquiry presented a unique opportunity to investigate the institutional structures and processes of WUAs in post-Apartheid South African water governance. Furthermore, the water sector reform in South Africa provides an sound opportunity to study how institutionalised implementation of local level water governance in the form of a WUA 'plays out' for different water user groups on the historically difficult ground of water supply and irrigated agriculture in the country. For the primary case in the Hex River Valley in the Western Cape Province in South Africa, a Water User Association had been established in 2007 enabling me to explore aspects of WUA establishment, but more so, their operation regarding water access and control in an agricultural context.

In the second study area, located in the Groot-Marico catchment in the Northwest Province, a WUA establishment process had been commenced in 2002, but failed in 2011. Completing the empirical picture of WUAs by providing findings on the failed establishment process, reasons for this failure I reveal in this thesis.

Multiple analytical levels are considered in this thesis to grasp multiple layers of politics and policy implementation in South Africa. As such, the 'cases' presented in the following Chapters are more than local instances. They fit within the national context of laws, history, regulations and institutions; they take into account the local level socioeconomic context and related it to the social interactions of water users, while considering national and local legislations. Comparing empirically relevant features from both cases presented a great opportunity to produce social-scientific evidence that holds the potential to inform future WUA establishment and operation in South Africa. As over 90 WUAs have already been established in South Africa and more are to come, this research aims to inform future implementation of water policy in South Africa and elsewhere. Indeed, WUAs are increasingly viewed right around the world as *the* solution for more participatory and sustainable water governance balancing increasing competition amongst users at the local level (Kemerink et al. 2013), a viewpoint to be critically examined in this thesis. For this purpose, I develop a set of criteria for analysing institutional governance called TARPCO in the following Chapter. TARPCO stands for transparency, accountability, representation, participation and collaboration, which mirror the normative governance principles of South African water policy and legislation and the normative vision of the NWA 1998. As such, these criteria were anticipated to shape WUA establishment and operation (DWAF 2007).

While I acknowledge that the findings generated might not be universally applicable, they have generalizable relevance for academics, decision-makers and practitioners in other countries and localities involved in natural resource governance. As such, the findings of this thesis present a contribution to the on-going scholarly discussion on what constitutes effective institutions for water governance. It also contributes to the current debate in South Africa about which form of governance at which level is likely to achieve improved access for those previously marginalised (Jonker et al. 2010). Another contribution of this work lies in the ways and results of investigating power in local institutions of supposedly collaborative water governance. I reveal a web of power relations existing at the intersection of local *contexts* (historical, social and economic); the ways in which local actors live their lives and the resources and capabilities available to them to pursue certain livelihoods (*agency*); as well as the formal rules determining the institutional mechanisms of water access and control originating from national legislation and policy as well as from the local WUA constitution (*structure*).

1.3 INVESTIGATING POWER RELATIONS IN INSTITUTIONS OF WATER GOVERNANCE IN A SOUTH AFRICAN CONTEXT

Facing a 'wicked problem' (Rittel and Webber 1973) such as the governance of water, one must acknowledge that there is no coherent theory that would be able to analytically grasp its complexity. However, water is a "total social fact" (Mauss 1950) as it traverses all dimensions of societies (Oliver 2010). When governing water on a societal level, this traversing nature of water and its complex interlinkages with all aspects of social life, stands most often in stark contrast to rather formal political approaches chosen to govern it. In the same light, scholarly discussions in the last 20 years on either 'top-down' or 'bottom-up' approaches to policy implementation most often overlook the polycentric nature of water governance and institutional arrangements (Goggin et al. 1990; Morison 2009). Whether the top or the bottom is the starting point, both approaches assume a rather linear mode of governance. However, some contend that the making and implementation of a policy is a commotion of purposes and accidents, of what is achievable and possible within constellations of actors in various dynamics of interaction (Clay and Schaffer 1984). Lankford and Hepworth (2010) make use of the metaphor of a 'cathedral and bazaar' to describe this contrast between water governance on paper and actual socio-political processes on the ground. They explain a rather centralised institutional approach of water governance with a cathedral: a state-steered process of developing laws and policies⁸ that regulate the establishment and operation of new institutions of water management like River Basin Organisations or local Water User Associations. Within such institutions decision-making processes regarding water are guided by national policies and laws representing a rather linear, state-tailored and regulatory mode of governance⁹ (Kooiman 2003). Such approaches suggest that 'good governance' built on robust institutions that are designed to achieve accountability, transparency and citizen participation (Jaspers 2003) will also lead to 'good outcomes' (Mollinga et al. 2010). Well-designed institutions are seen as critical to regulating resource access (Peters and Pierre 2007), preventing the degradation and depletion of the resources (for example forests, fisheries, wildlife and water) through collectively managing common pool resources (Ostrom 2007) in order to create sustainable livelihoods (Woodhouse 2002). Policy reform following this mainstream understanding of institutions (Cleaver 2012) often involves a complete realignment of institutional structures, or establishing wholly new, decentralised institutions of (water) governance on a local level (Horlemann and Dombrowsky 2011) envisioned to provide incentives for collaboration among resource users (Heikkila et al. 2011). To build such a 'governance cathedral', 'crafting' or 'designing' the right kind of institutions (Ostrom 1992) has become central to conventional approaches to govern water and other natural resources.

⁸ A process that is developing countries often influenced by international actors like donor organisations, NGOs or respective government departments of other countries (Cherlet and Vernot 2013).

⁹ Following Benz et al. (2007), governance in this thesis is in its broadest sense understood as the "coordination of societal action". Water governance, thus, I define as the socio-political coordination of societal action around water. Chapter two and three elaborate on this in greater detail.

However, I argue in this thesis that this 'design paradigm' stands in stark contrast to the highly diverse, complex and ever-changing nature of social action around water (see also Kooiman 2003; Halbe et al. 2013). Similarly, the 'bazaar' in Lankford and Hephworth's (2010) analogy describes a polycentric and complex mosaic of nested societal units producing a messy social reality of water governance (see also Lewis 2009). In other words, the diversity of social phenomena and complex social structures shape social action and the establishment and operation of institutions (Archer 2000; Cleaver 2012). Given the socially traversing nature of water issues, this is especially true for local institutions of water governance (Ribot 2009). Indeed, international evidence suggests that the way policy 'plays out' in practice depends to a greater extent on conditions and contexts found in reality than on the way the policy was normatively 'designed' (Houtzager 1999). Lipsky (1980) has shown that the form a policy takes in practice and how it affects local people's lives depends on those who implement the policy and how they interact within often complex contextual arenas. In a similar line of thinking, Kooiman (2003) points out that our social realities are not created by 'either-or relationships', but by complex 'and-and relationships' (see also Boelens and Zwarteveen 2005). This notion is central to this thesis, because institutions in the game of water governance are one such example of a complex arena of social realities and and-and-relationships. Within processes of negotiation over access to water in such institutions, power plays a central role (Mosse 1997; Merrey et al. 2007; Epstein 2014). Although power is one of the most central concepts in social and political sciences (Haugaard and Clegg 2012), it is most often an underemphasized factor in research on water governance institutions (Brisbois 2015; May 2015). In this thesis, I examine the sources and the exertion of power in processes of water governance and I also attempt to uncover rather 'invisible' workings of power (Lukes 2004).

In this light, this cross-case analysis informs the process of establishing Water User Associations in South Africa and elsewhere. It focuses on complex processes of institutional water access and control and examines underlying power relations inherent in these processes. In doing so, it takes a plural theoretical perspective in order to analytically 'grasp' the socio-political complexity of how people make a living and how their livelihoods relate to a formal mechanism of (supposedly) collaborative water governance.

The empirical results presented in the following Chapters challenge ideas, which assume that collaborative institutions of natural resources governance can be crafted by political designers on paper, which will lead to good governance outcomes for local people in practice. Such ideas largely overestimate the influence of formal rules on people's behaviour while downplaying the role of agential conflict and power asymmetries in shaping the outcomes of water governance, as well as underestimating contextual factors, such as economic patterns or history.

1.4 THE METAPHOR OF THE GAME

I employ the metaphor¹⁰ of a 'game' as the guiding theme for the whole thesis. A game conceptually resembles the intersection of the rules of the game (structure), the actors in this game (agency) and the context in which the game is played (context). Using a game as the conceptual main frame for this thesis interlinks these conceptual components to the organisation of the Chapters. I analyse the legal and institutional structures of water governance in South Africa in Chapter 4, providing the rules of the game. I investigate the livelihoods of three local water user groups and their agential resources and capabilities available to them to play the game mainly in Chapter 5 and 6. All three Chapters as well as the concluding remarks present their findings in relation to the historical, social and economic contexts (national and local).

However, game theory can enable insights into any, social, political or economic phenomenon, which involves individuals or groups with different goals and preferences, who make decisions that will influence each another's achievement of the aspired goal (Myerson 1991). As such, it is well-suited as an overarching theoretical analogy for the organisation of the Chapters, while also adding analytical value to the concluding Chapter.

From a game theory perspective, the outcomes of a situation or problem (game) are determined by the actions of the participants in the game (players or actors). The actions each player¹¹ can take are shaped by first, their resources and capabilities to play the game, and second, by the rules of the game allowing or forbidding (and potentially penalizing) certain actions. The game in this thesis is to access and control water politically organized in the local institution of WUAs. The game board are the two study sites. The strategy each player employs for the game, is determined by the livelihood resources and capabilities available to the individual or group. The participants of the game in this thesis are large-scale commercial farmers, emerging and small-scale rural farmers and the poor living informal settlements. The referees in this game are government actors in the water sector, mainly the Department of Water Affairs and Sanitation.

Now, borrowing from Giddens (1984) there are constitutional rules and regulative rules. Constitutional rules define what a game *is*. Using the game of chess as an example, constitutional rules define what the game of chess is about. They constitute the goal of the game, the shape of the game board, the number of boxes, the numbers of figures to move on the game board and the number of players who can play. Subsequently, regulative rules are those defining how to play the

¹⁰ This metaphor I adapted from Boelens (2008).

¹¹ At this point, it is necessary to mention that game theory is based on a behavioural postulate of a egoistic-benefit-maximisation of each player. The strategy of each player is thus to maximise their payoffs, regardless of the outcomes for the others playing, while also assuming that the other players would act in the same self-centred manner (Podimata and Yannopoulos 2015). Also, game theory models are in essence mathematical models for problem analysis and decision making to study conflict or cooperation among rational individuals. As such, they, at least in this sense, do not necessarily go well with qualitative research approaches, which is the reason for not using game theory to guide the analysis of the findings, but as an overarching theoretical analogy for the Chapter and the thesis as a whole.

game: how each player can act, the movements of his or her figures on the board and the consequences of certain actions. They are the regulatory boundaries of how each player can act. Both, constitutional and regulative rules provide the 'structure' of rules for what actors in the game are allowed to do and which actions are forbidden. Acknowledging that social action is never linear, but dynamic and in constant flux, theoretical thinking is always an abstraction of reality, but they provide useful for analytic purposes.

Linked to this, the use of the 'the game' as an overall metaphor for the Chapters comes from the topic of this investigation: the fact that in SA the DWS has developed a new set of constitutional and regulative rules for post-Apartheid water governance, which outline how different actors can access water. Further value of game theory for this study is due to my theoretical focus on power relations, thus entailing conflicting interests and interest implementation strategies. Actors can use their power to re-interpret rules, manipulate their formulation or simply ignore them. This is, of course, given that the potential referee of the game does not sanction such actions. Subsequently, if one player does not know the constitutional and regulative rules of the game, but has no other choice than to play with other knowledgeable players, he or she is likely to lose the game, because of a lack of knowledge of what this game is about and how to move. Powerful players can thus rule the game in different ways.

1.5 THESIS OUTLINE

This thesis is organised into seven Chapters.

Following this introduction, a literature review in **Chapter 2** presents the context of the research problem outlining relevant aspects of South African water governance implementation. A focus is given to the institutional implementation of Water User Associations while also discussing the underlying idea of South African water governance, Integrated Water Resources Management (IWRM). Providing the theoretical and conceptual lens of this thesis, I discuss international theoretical literature concerning social theory, institutional theory and power theories. Based on this discussion, I develop my own systematic framework (TARPCO) to analyse the WUA regarding its democratic collaborative governance character. The analytical themes of TARPCO (transparency, accountability, representation, participation, and collaboration) I also use as an ordering framework to organise the sections providing the analysis of the processes *in* and *around* the Water User Associations across both cases.

In **Chapter 3**, I present this thesis' social - scientific approach and research methodology. It starts by explaining this thesis' qualitative case-based research approach and continues by elaborating on the social scientific methods used for information gathering, the selection of cases and participants, approaches of data collection and data analysis. This Chapter links the local research context and research problem to the chosen methodology and theory applied.

In **Chapter 4** (Rules of the Game), I provide an analysis of the structures of water governance with relevance to South African Water User Associations. Offering insights into water- and WUA-related policy and legislation, this section presents rules of the game of water access and control through formal mechanisms of water governance. This formal set of rules determines the game arena and relates the actors in this game to one another (to a certain degree). As such, they are the foundation for analysing empirical data from the field contrasting and comparing everyday water governance processes of access and control in and around the WUAs in both cases, with the normative intentions of policy and law.

Findings from the first case study of the Hex River Valley in the Western Cape Province of South Africa are presented in **Chapter 5** (Contextualising the Game and its Actors). It is further divided into three subchapters. The first subchapter provides an analytic description of the general livelihood context in the Hex River Valley. I present, for example, socioeconomic patterns of economic production and labour relations found to be dominant in the Hex Valley, while taking into account historical legacies of the Apartheid era, which, for example, affected the livelihoods of thousands of farm workers in a similar manner. It thus lays out the 'contextual bed' in which the WUAs are 'embedded'.

In the analysis of the specific livelihood context, the second subchapter is devoted to presenting the empirical findings of the how three groups of local actors (large-scale commercial farmers, upcoming black farmers and poor people living in the settlements) live their life and which factors influence their livelihoods in the game of accessing and controlling water. Central to this subchapter is firstly, an analysis of actor's endowment with resources and capabilities to pursue a certain livelihood. These resources and capabilities are crucial assets in the highly competitive game of accessing and

controlling water. Secondly, using analytic narratives which portray a typical day in the life of a member of each of the water user groups, I deepen the understanding of how people live their life in relation to each other and in the context of accessing and controlling water for productive purposes. This is of importance to the power-based discussion in the following Chapters of this thesis. The human, social, economic, financial, physical and natural resources and capabilities that can be drawn upon by each water user group to pursue their livelihood, are the same resources and capabilities which are sources of power to access and control water within an institution intended to organising social behaviour of water users according to a formal set of rules.

Subchapter three (Of Rules and Games) is devoted to the institutional analysis of the Hex Valley Water User Association taking into account relevant characteristics of its establishment and operation regarding water access, control and distribution. The TARPCO criteria provide the conceptual fundament for this analysis. I use them to organise the Chapter systematically channelling the findings from the livelihoods analysis into well-known categories of institutional and governance theory. In South African legislation, these criteria also represent the normative benchmarks of the South African government to be achieved, while reforming water access and control in the country. Consequently, I investigated how these criteria have reflected in the national water policy and law, as well as the Constitution of the Hex Valley WUA potentially guiding its establishment and operation in everyday practice of water governance. Critical questions include: has this approach led to the creation of a transparent, accountable, representative, participatory and collaborative institution of water governance benefitting previously disadvantaged in terms water access and control? What role did the actors (including the governmental actors) play and what has that to do with the historical, social and economic context?

Following the presentation of findings from the primary case in the Hex River Valley, in **Chapter 6** I offer my analysis of relevant characteristics from the secondary case of the Groot Marico catchment in South Africa's Northwest Province. It follows the same logic and is thus organised in the same three subchapters as Chapter 5. However, the analysis of Case 2 is purposefully not as detailed in contextual width and depth as the primary case. The theoretical categories of the conceptual framework used in the first case study, I also apply to analyse findings from the second case. But due to the practical finding of 2014 that the establishment of the Marico Bosveld WUA was never officially finalised, a slightly different methodological approach was necessary in order to investigate relevant factors for this non-establishment. This research approach is explained in Chapter 3. However, the investigation of the failed establishment process of a WUA in the Groot Marico catchment provided supportive empirical evidence one of this thesis' main arguments of the overlooked, yet crucial relevance of power relations to processes of local institutional water governance.

Finally, **Chapter 7** presents a synthesis across the cases and concludes the thesis. I argue that power dynamics and erroneous perceptions about IWRM and newly established institutions delivering social change lie at the heart of answering the question how Water User Associations work and how that interrelates to local people's livelihoods.

CHAPTER 2 - BUILDING A THEORY FRAME AND CONTEXTUALISING THE GAME

2.1 INTRODUCTION

In order to answer the question of how WUAs are working this thesis turned its theoretical attention towards exploring the ways in which this formal institution of water governance interrelates with local livelihoods in two cases in two Provinces of South Africa while investigating the role of power in the game of accessing and controlling water.

This Chapter is organised into four sections. First, I discuss what social theory can contribute to better understand issues of power in institutional water governance in South Africa. Drawing upon the mutually constituting elements of social theory of structure and agency, I present the first element of this thesis' nested theory frame. Second, discussing theoretical ideas of water governance and of critical institutional theory, I argue that institutions of water governance are products of a multitude of historical, socioeconomic and socio-political factors rather than of formal institutional design. As such, I emphasize that the interaction and relationships of people in the established institutions are central to how institutions work in practice, although I assert structural aspects of policy and law to be also crucial to local level water governance. Furthermore, the historical and socioeconomic context 22 years after the end of the Apartheid regime is crucial to understand and analyse these interactions, and thus, to explain what they means for water access and control. To explore this context in relation to the actors, the use of the Sustainable Livelihoods framework is discussed. Third, reviewing theoretical concepts of power, this section identifies useful approaches for the examination of power in local institutions of water governance. Finally, a synthesis is proposed, merging the concepts into one core theoretical framework guiding this research thesis.

2.2 STRUCTURE AND AGENCY - THE RULES OF THE GAME AND ITS PLAYERS

Trying to bring social theoretical approaches and the Sustainable Livelihoods Framework into a constructive dialogue with theories of power requires a brief discussion of the theories' underlying concepts as relevant for this study. To integrate the well-known theoretical concepts, I use Rueschemeyer's (2009) idea of a 'theory frame' consisting of nested theoretical concepts with the aim of adequately grasping the complexity of the problem. This 'nestedness' of theoretical approaches here mirrors the conceptual layers of the research problem into a macro level dimension of water law and policy; a meso level dimension of institutional governance through WUAs; and a micro level dimension of social actors competing for water embedded into the local context.¹²

The way in which the constituent parts of this theory frame will contribute to the thesis as a whole will become apparent in the course of this Chapter.

Theoretical conceptions of social action occupy a central position in social philosophy and social sciences (King 2004). At the heart of social theory lies the contested question of why humans behave in a certain way. Some social theorists have emphasized the centrality of societal structures such as political systems, a system of legal rules, socioeconomic systems, social norms, cultural beliefs and practices for understanding and explaining social (inter-) action and societal outcomes (Parsons and Shils 1957; Ritzer 2013). Their usefulness for this thesis lies in the accentuation of structural factors of policy, law and rather formal institutions in shaping social action. Such thinking, however, largely underemphasizes the role of social interactions between actors in socio-political processes. As "water governance is about people" (Oliver 2010), investigating only structural factors would mean to be analytically blinkered.

However, other scholars in the field of social theory and sociology put emphasis on the importance of individual and collective actors as the driving force behind social action and thus, as the preferred explanatory unit for the analysis of it (Weber 1925; Homans 1974; Coleman 1990). This rather actor-oriented branch of social theory assumes that human beings (referred to as agents) in their daily activities are key to understanding societal action (Archer 2000).

Again, other scholars have developed social theories that call attention to the interplay of both, societal structures and individual agents. Such rather integrative theories (Giddens 1984; Archer 2000) propose that everyday life phenomena of social action are an outcome of structural factors *and* agential factors (Ritzer 2013). Giddens theory of 'structuration' for example contends an inseparable dualism between structure and agency (Giddens 1984). People behave according to laws, but they re-interpret them within their everyday livelihood contexts. Archer (2000) emphasizes this dualistic nature, but argues for an analytical distinction between structure and agency, even though highlighting their connectedness in the real world (Cleaver 2012). However, structure and

¹² Dividing and thus limiting the research problem into a macro-, meso, and micro-level surely misses out many other problem contexts and layers. The international dimension, relevant politics and societal discourses in South Africa for example are omitted. However, reducing a research problem into researchable units, while leaving out others, is a standard exercise in scientific research to narrow down a research focus.

agency are not just things that exist; they are emergent properties of human action. In other words, policy, law and state institutions are what the people make of it, while having created them in the first place.

However, the more ontological than practical dichotomy between structure and agency (Dowding 1994) rests partly on the seemingly all-encompassing category of structure. Structure often ranges from habits, norms, cultural belief systems, social classes, to socioeconomic patterns, legislation, policy and institutional units of a state or international units of governance. In this thesis, however, the term structure refers exclusively to policies, laws and institutions of the state, such as the Department of Water Affairs and Sanitation or a CMA or WUA. The National Water Act 1998, I regard as a structure, the CMA which implements it is also a part of the analytical category of structure, the same as the internal Constitution of a WUA. The over-freighted category of structure needs to be more concrete and precise.

However, Coleman (1990) shows that social action is always complex, context-dependent and embedded into structural meso- and macro-level contexts. I introduce the category of 'context' in order to cover historical, social and economic factors in my analysis and to conceptually differentiate between structures and other factors. This helps to 'free' the term structure from its contextual over-load. This thesis subscribes to structure and agency as mutually constituting dimensions of socio-political action (see also Cherlet and Venot 2013; Giddens 1984), while introducing the additional category of 'context'.

The use of differentiating between the three categories, besides making them more precise, is their relation to theoretical approaches to power. I use them as qualifying adjectives for power; conceptually I use them as a link to the three well-known concepts of power: the agential power to do something in the first place (power-to); the power that lies within a structure of rules for those with the knowledge of how to use them for their benefit (power within); and a form of power of involved actors to influence the livelihood capitals of others (power-over). The latter also has a dimension of South Africa's historically-laden, socioeconomic interactions of water users in post-Apartheid South Africa. For example, historical patterns of colonial and Apartheid white dominance and black exploitation in production and labour relations were still visible in both study areas. Their repetition over time had created social patterns perceived as 'the order of things', for example white ownership and privileged use of water for productive purposes. During the Apartheid, this was backed up by a system of legal rules institutionalising white privileged water access. During this research, black upcoming farmers still followed this historically grown narrative and referred to the water available, as 'their water', meaning white commercial farmers' water. Even people employed by the water institutions of CMA and WUA, followed this historical narrative giving the commercial farmers a higher standing in the hierarchy of water access and control. The category of context is thus emerging from agency and structure interactions specific to South Africa.

This context, I have found to be what Foucault describes as a rather invisible 'field of force' of power. It is constituted by people's interactions while pursuing their livelihood strategies, which again are shaped by the historical patterns of race-based socioeconomic production and labor organisation in South Africa. These factors also shaped the establishment processes of the WUA, their operation concerning decision-making over as well as the physical distribution of water and has, in the first

place, influenced the constitutional and regulative rules codified in the National Water Act 1998 and those rules contained in the model constitution for WUA operation.

Here, one aspect of social theory concerning structure and agency is key to this investigation. Attempts to understand the role of structural and/or agential factors in social action, has often occurred in a negative dimension (Saar 2010). In many instances, a social philosophy and social theory has always been one of “balancing losses and costs that arise from the non-convergence of sociality and individuality” (Saar 2010, p. 198). So understood, for the individual (or at least for some) there is a certain price that comes with the formation of a social order, of a political system or the establishment of formal political institutions of water governance, such as South African WUAs. The ‘*qui bono*’ question of social and political sciences comes into play here. Investigating *who benefits* from establishing a certain societal structures, such as laws and state institutions, and to try to understand why and how that is the case, is central to research in social and political sciences. As such, key questions for this thesis include: how have the three water user groups at the two study sites benefitted from water governance through WUAs? Why is that the case? And, which agential, structural and contextual factors can be used to explain this?

As such, my line of argumentation in Chapters 5, 6 and 7 oscillates in between those three theoretical categories of structure, agency and context while using them to further differentiate between dimensions of power. I have thus derived conceptual ideas for the analytical themes of power from international academic literature, while enriching them with theoretical notions emerging from the analysis of the empirical data. The game of accessing and controlling water in South African water governance thus consists of an interactive continuum made up of those three deeply interwoven dimensions, which determine water access in everyday realities of institutional water governance.

2.3 THINKING ABOUT WATER GOVERNANCE AND INSTITUTIONS: DISTILLING THEMES FOR THE ANALYSIS

The landscape of water governance around the world has shifted in the last decades. Common types of centralized command-and-control government changed, as a more diverse range of actors entered the sphere of governing water (Brisbois 2015). Such governance has increasingly become an important element in scholarly and political discourses about the state, society and societal action since the 1990s (Kooiman 2003; Jonker et al. 2010). This rests partly on the realisation that in a more globalised and interconnected world in terms of flows of finance, natural resources, labour, production, consumption patterns and services, the role of a nation - state, seen as the dominant influential for global processes, is shifting (Franks and Cleaver 2007). For the governance of water this means that access to water resources and water supply services is often beyond the classical realm of centralised government departments. This creates a situation in which citizens have to interact with an array of different units of society for the services they expect. The public sector, private entities, voluntary arrangements (or hybrids of the three), are of importance for the governance of water on national, regional and local levels involving a multitude of actors from different levels of society (Benz et al. 2007).

The call for a more inclusive approach to governance is rooted in the increasing complexity of problems faced by societies, as well as decreasing capacity of governments to respond to global political trends that cross political, social and economic boundaries and changing norms regarding the role of public and private actors (Brisbois 2015). To address increasingly wicked problems (Rittel and Webber 1973) around the societal coordination of water, different models of institutional co-governance, including co-management (Armitage et al. 2009), community-based natural resource governance (Mulale et al. 2013) and collaborative governance (Koontz 2004) have been employed. Within decentralised institutions trying to build mutual understanding, trust and consensus among a great variety of actors in face-to-face meetings typically in a new local institution created by government (Ansell and Gash 2008), such approaches are thought of to be more 'grounded' than classic top-down governance modes and thus to have greater legitimacy among local actors (Sabatier et al. 2005).

However, to progress further it is useful to take a brief look back on classical understandings of governance in general. The UNEP (2006, p.11) offers a widely accepted definition: "Governance is the exercise of economic, political and administrative authority to manage a country's affairs at all levels (...). It comprises the mechanisms processes and institutions, through which citizens and groups articulate their interests, exercise their rights, meet their obligations and mediate their differences." This definition outlines distinct dimensions of governance: economic, political and administrative. Whereas economic governance focuses on decision-making related to economic activities of production and consumption, political governance is described as focusing on decision-making concerning the development and formulation of policy and legislation. Implementing institutions and regulatory guidelines of policy and law is often referred to as administrative governance. However, in everyday practice those dimensions overlap and interact with each other, because within the process of exercising political authority it is people that interact with each other, making water governance inherently social and political.

In international academic literature the most well-known definition of water governance comes from Rogers and Hall (2003, p. 10): “Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services at different levels of society.” From 2000 onwards a set of normative principles that portray a certain desirable outcome of governance processes like accountability, transparency, decentralisation, representation and participation in decision-making structures have come to the forefront of international literature on water governance (UNDP 2006; Mollinga et al. 2010; UNESCO 2015). Undoubtedly, such democratic principles have crucial practical value; both as codes for conduct and as an outcome of certain processes, they hold immense importance for expedient and (water) governance according to democratic principles. However, while such ‘good governance’ of water seems like a desirable goal that most can agree on, the question of how to achieve it in daily practices of decision-making in a smaller sub-catchment or in a local institution - like a Water User Association for example - is often left unclear (Biswas 2004; Mollinga 2008), or rather not taken into consideration when designing institutional arrangements for such good governance (see Molle 2008; Molle et al. 2008). From a global perspective, the UN Millennium Development Goals have explicitly highlighted the importance of ‘good governance’. At the UN’s ‘Global Forum on Reinventing Government - Building Trust in Government’ held in Vienna 2007, the final document released said that “one of the most important aims of the United Nations’ Programme of Reinventing Government is to promote good governance towards the realisation of the MDGs” (UNPAN 2007). This also relates to the fact that, the absence of ‘good governance’ is increasingly debated as an inhibiting factor towards achieving equitable water access, and efficient and sustainable management. In that view a global water crisis is not a crisis of physical scarcity, but a crisis of governance (UNEP 2006; Molle et al. 2007; Merrey et al. 2007).

However, such discourses on the principles of ‘good governance’ (Biswas and Tortajada 2010) have in common the implicit understanding that ‘good governance’ would also lead to ‘good outcomes’ neglecting that transparency for example does not appear magically, but is an outcome of complex social and political processes. Policy travels a long way until it hits ground, and the outcomes of such processes are all but certain (Cleaver 2012). Promoters of good governance tend to assume not only good outcomes, but tend to largely overlook that actors in the governance game of accessing and controlling water need the capacities¹³ in the first place (to participate, to achieve transparency and benefit from it, or, to collaborate with others) *before* such outcomes can be achieved in complex social realities that are characterised by highly diverse socioeconomic, socio-political and socio-ecological contexts. Designing the supposedly ‘right’ political, legal and regulatory and administrative rules, does not automatically give the people the resources and capabilities to understand, access and utilise them. In the realities of South African everyday life regarding water governance, people often do not know what political or legal mechanisms, processes and institutions exist, which govern their access to water, let alone how to use these mechanisms for their benefit (Förster et al. 2017). The lack of knowledge of one actor often opens up ‘room to manoeuvre’ for powerful individuals, groups, and lobby organisations exploiting the knowledge gap of others for their benefit. If the supposedly governmental referee in this governance game for

¹³ Capacity in this thesis is defined as: the ability to use resources and capabilities to achieve something.

water lacks the capacity to enforce certain rules and regulations, this 'room' becomes even larger (Brisbois 2015). This is true for many people in countries all over the world, especially for the resource-poor and marginalised individuals and communities in the developing world (UNDP 2006).

Nevertheless, rooted in a traditional 'predict and control paradigm' (Halbe et al. 2013) of legal reforms and policy implementation of central governments, the often implied consensus of good governance leading to good outcomes disguises a lack of enquiry and theory-informed understandings of how water governance arrangements actually work out in practice. Ostrom in 1992 (p. 14) already warned (despite her own academic emphasis on institutional design principles) that new institutions might not work in practice "as they do in abstract models unless the models are well specified and empirically valid and the participants in a field setting understand how to make the new rules work." This thesis argues for a need to take a step backwards in order to move forward here: it is not only about making the rules work; it is about making them in the first place. The way such rules are developed and formulated often excludes the marginalised and vulnerable; resource-poor people from access to decision-making structures in practice and thus, so do the processes these rules are governing.

Besides the overall trend of changing patterns in the way societies tackle challenges of water governance from a more government-centred to a more multi-actor and decentralised approach, a remaining issue is that in most countries of the world state authorities are still - at least to a large extent - controlling and regulating processes of water storage, distribution, treatment and possible re-use through certain state-steered institutions and through cooperation with other entities like private companies (Swyngedouw et al. 2002). State-steered socio-political structures therefore in many instances shape the way resources are accessed and used (Molle et al. 2007).

Related to this, Ostrom in early 1993 (p. 1907) prophesised that "for the next several decades the most important question related to water resources development is that of institutional design rather than engineering design." However, it is essential to question the causal logic behind the 'engineering design' and 'institutional design' and critique both as similarly simplistic. Within an engineering paradigm it is assumed that societies are able to bend nature according to human will and demands through human-made infrastructures, for example forcing a river through a cascade of dams, canals and pre-shaped riverbeds to follow a certain direction. The logic for an institutional-design-paradigm is similar: through a set of legal rules applied to an aspect of social interactions, the outcomes of such interactions can be purposefully shaped by the rule of law. Through legislation, regulations and policy guidelines, governments set a network of institutional rules that seek to shape the dynamic way in which actors may or may not behave. A critical question, however, is, can social behaviour, can collaboration among stakeholders be legally prescribed and designed?

Collaborative governance is a mode of governing that includes state, private and civil society actors (Koontz and Thomas 2006; Ansell and Gash 2007). It is primarily related to actor collaboration on a national scale, but not limited to it. Collaborative decision-making processes assume a behavioural postulate shifting from representation and participation to collaboration guided by Habermasian notions of deliberate communication processes in democracies (Habermas 1981; Cleaver 2012). Such normative logics of social action, however, idealise a communicative rationality characterised by being broadly inclusive, rational, honest, informed and more equitable dialogue-based

interactions (Murray 2005), in other words they ‘play down’ or ignore social conflict and power inequalities.

The rapid emergence of collaborative approaches to natural resources governance since the 1990s, in particular water governance, has been labelled by some scholars as “the era of the collaborative state” (Koontz and Thomas 2006, p.111). Socio-political collaboration for Kooiman (2003, p. 34) is “doing things together in an organisation”. However, regarding the microcosm of a wider socio-political world determined by complexity, dynamic relations and diversity that such institutions represent, the ‘together-part’ remains a challenge in practice (May 2015). Indeed, international research on local institutions of collaborative natural resource governance indicates similar implementation challenges to those encountered with local level water governance (May 2015). Decision-making, sharing of responsibilities and creating accountability (Bloomquist and Schlager 2005), the embeddedness into larger and inflexible governance bureaucracies (Ananda and Procor 2013) and also a lack of fit between the newly established institutions and the social processes that they try to govern (Bixler 2014) are often highlighted in this regard.

However, the perspective taken here is that collaboration is akin to participation, with collaboration being a more active form of involvement (Berry n.d.). Participation has become an academic and political buzzword and can mean anything from simply ‘taking part’ and thus being physically present at a meeting, to a more active form of participating. This includes making one’s voice heard; having a say in decision-making; having guaranteed voting rights or a veto-right to certain decisions; joint consultation and negotiations and thus, to collaborate with other actors involved to achieve a shared control over processes that regulate resource access (Arnstein 1969; Pollard and du Toit 2008; Mulale et al. 2013).

Berry (n.d., p.2) considers collaboration¹⁴ as a “somewhat more active notion of participation in which individuals or groups (usually referred to as stakeholders) debate, consult, and make decisions associated with an endeavour”. Such a notion of collaboration fits well with the actual definition of WUAs in the South African National Water Act 1998 (Chapter 8, preamble): “They operate at a restricted localised level, and are in effect co-operative associations of individual water users who wish to undertake water-related activities for their mutual benefit.” This speaks to a peculiar sentence in the National Water Act that stands right before the above quoted legal definition of WUAs (Chapter 8, preamble): “Although water user associations are water management institutions their primary purpose, unlike catchment management agencies, is not water management.”

¹⁴ On the one hand, ‘co-operation’ comes from Latin word ‘cooperatus’ as past participle from the verb ‘cooperari’, which means ‘to work together with’. On the other hand, ‘collaboration’ is the noun from the Latin verb ‘collaborare’ which contains the root of today’s English word ‘labour’. It stems from the combined words of ‘com’ or ‘cum’ meaning ‘with’, and ‘laborare’ meaning ‘to work’. So ‘collaborare’ translated into modern English is ‘to work with someone’ (Harper 2016). However, debating the etymological nuances of the two terms was not the purpose of this thesis. Combining Berry’s (n.d.) notion with the etymological roots of both, I use, in the absence of a more appropriate alternative, the word collaboration in the sense of ‘working together’ and thus in the same sense as cooperation.

Notably, when 'individual water users' are supposed to 'cooperate' in an association they have to work together, and as such, members have to debate, consult, negotiate and make decisions 'for their mutual benefit' regarding water. If the aim is not water management, but to do 'water related activities' (whatever that may mean), then the ultimate goal contained in those two, sentences is: working together to mutually benefit from joint decision-making over water related matters. This clearly describes collaboration in water management as a constituting element in South African water governance.

However, a replication or corroboration of existing unequal water distribution patterns in newly established and supposedly collaborative institutions of water governance is a common finding in recent national and international academic literature on South African WUAs (Wilson and Perret 2010; Brown 2013). However, this is diagnosing a symptom, not addressing the cause. Related literature often overlooks the underlying root cause, namely power asymmetries (Clever 2012; see also Mulale 2013). Power dynamics or power asymmetries are briefly mentioned in many of the publications referenced above, but are not substantiated by theory-informed investigations focusing on the question of how exactly power manifests itself.

In particular, the local institutional level of water governance has received a considerably small amount of social scientific research attention, despite being the very level at which everyday water governance decisions regarding water access are made (Shankland 2000; Merrey 2007; ESP 2010; Gupta et al. 2013). "Practical diagnosis" of the challenges encountered with South African institutional governance of water, "remain in their early stages" (Wilson and Perret 2010, p. 184). There has been little research on how a formal system of governing institutions on a local level in South Africa interrelates with livelihoods of individuals. In order to bridge this research gap, interactions between institutionalised policy and livelihoods of people need to be better understood (Shankland 2000). We therefore have to rethink water governance and its institutions and realign them with the 'bazaar' of social relations and social interactions (Lankford and Hepworth 2010) between people and their livelihood strategies, while seriously taking into account power differences of the actors involved.

Water governance in this thesis is understood as the totality of legal structures and policy documents, instruments for policy implementation, state actors and processes used to coordinate social dynamics of water access and use, traversing from an international level to the local level (see also Lafferty 2004). In short, water governance is the societal coordination of socio-political action around water (Benz et al. 2007). Thus, this thesis uses an analytical framework for water governance that understands it not as a collection of abstract principles of good governance, but as an interlinked process of many context-dependent factors with real outcomes for real people. So understood, governance as an overarching concept allows for analytically encompassing multiple levels of societal action. The macro level sphere of formulating policy and law; the meso level of policy implementation through certain institutions; and a micro level at which social processes of water access and control are happening. All that is governance (see also Giddens 1984; Kooiman 2003). I thus broaden the perspective on water governance connecting the too often separated levels of policy, institutional architectures and their interaction with local people's lives embedded into local contexts.

South African water governance builds on the above-mentioned 'good-governance-design-paradigm' for water governance institutions and many of the aspects discussed above feature prominently in the South African water governance approach. However, in practice, the formal institutional approach "ran into serious difficulties" (Swatuk 2005, p.876; see also Schreiner 2013) and the establishment and operation of institutions faces several challenges and suffers from substantial backlogs (Förster et al. 2017). Despite the prominent idea in international and South African literature of a lack of financial and human capacities on government level to implement the policy in practice, while underestimating the complexity of the task (a finding well-grounded in empirical evidence) (Woodhouse 2002; Perret 2006; Schreiner 2013; Brown 2013), the issue of underlying power issues and their impacts on institutional functioning remains largely unaddressed.

Elaborating on South Africa's 1994 water governance reform, it is useful to take a closer look at the underlying conceptual idea for this water reform - Integrated Water Resources Management (IWRM).

2.4 CHALLENGES OF INTEGRATED WATER RESOURCES MANAGEMENT (IWRM) IN SOUTH AFRICA

The underlying philosophy for the formulation of South Africa's new water governance framework was Integrated Water Resources Management (IWRM). Since adoption of the Dublin Principles of Water¹⁵ in the preface of the 1992 Earth Summit in Rio de Janeiro, IWRM has been hailed heavily within the global political arena (Anderson et al. 2008). The Global Water Partnership (GWP) defines IWRM as "coordinated development and management of water, land and related resources in order to maximise economic and social welfare without compromising the sustainability of ecosystems and the environment" (GWP 2011). IWRM is an approach to water governance that was advocated as to encapsulate ideas of equity, efficiency and sustainability to water, aiming to integrate social, economic and environmental factors across sectors in a holistic approach (Oliver 2010). It furthermore advocates a participatory approach to water governance and the devolution of decision-making power to decentralised, regional and local units of water governance (Rahaman and Varis 2005; Goldin 2008; Pollard and du Toit 2008). Over the last twenty years, IWRM has become the dominant paradigm in water governance of both developed and developing countries around the world (Merrey et al. 2005).

International scholarly discussions about IWRM have only emerged during the 1990s and 2000s, while at the same time IWRM was employed to inform water policy formulation in more than thirty countries around the world (UN Water 2008). The topic of how IWRM is conceptualised and how such conceptualisation affects its efficacy in practice has been contested ever since.

According to Barlow (2007) it was powerful global players like the World Bank, IMF and the UN that shaped political consensus around water management promoting IWRM in giant global forums like the World Water Forum in the Netherlands (2000), the World Summit of Sustainable Development in South Africa (2002), the World Water Forum in Japan (2003) and three years later the World Water Forum in Mexico. In order to push this agenda seen as 'hiding' privatisation of the water service sector and commodification of water as an economic good under the cloak of IWRM, global institutions like the GWP or the World Water Council have been founded by the above-mentioned organisations (ibid.). However, the GWP's attempt to conceptualise IWRM cited above has been in the centre of critique and various attempts have been made to concretise it. Critics argue that without a proper definition of what it is and what it is not, implementation of IWRM will remain elusive. Some authors - although for quite different reasons - have argued the GWP's definition is too narrow and needs to be broadened (Rahman and Varis 2005; Merrey 2005), while others view it as too wide (Biswas 2008; Molle 2008), making it an all-embracing nirvana approach (Molle 2008), which by no means is conceptualised enough to present a guideline for policy implementation on national and sub-national levels (see also Tapela, 2002; Moriarty and Butterworth 2003; Swatuk

¹⁵ The Dublin agreement of 1992 defined the following principles of water: 1) freshwater is a finite and vulnerable resource, essential to sustain life, development and the environment; 2) water development and management should be based on a participatory approach, involving users, planners and policy-makers at all levels; 3) women play a central part in the provision, management, and safeguarding of water; 4) water has an economic value in all its competing uses, and should be recognised as an economic good. Especially no. 4 has been contentious ever since.

2005; Ingram 2013). In a similar line of thought, Biswas (2008) points out that it has over the last twenty years remained an elusive concept, which may provide an underlying roadmap for water governance; but it does not provide instructions on the direction or destination for those 'driving' the policy implementation in practice. Others more critically have declared IWRM as "inefficient and counterproductive at best" (Shah, n.a) or rejected it outright (Biswas 2008). IWRM-based water governance has been criticised for delivering results that oftentimes fall short of promises and that water problems "continue unabated or even worsen" (Ingram 2013, p. xv). Lautze et al. (2011, p.6) for example point out that water governance based on IWRM is "more prescriptive in nature, having largely pre-defined outcome goals", whereas real world societal action is shaped by a multitude of social processes with rather uncertain outcomes.

Shah (2000) argues that: "Drafting water laws is easy, enforcing them is not. Renaming regional water departments as basin organisations is easy; but managing water on basin level is not. Declaring water as an economic good is simple; but using price mechanisms to direct water to high-value uses is proving complex". Accordingly, a considerable number of critical researchers and scholars from different international contexts have concluded that challenges with IWRM-based water governance occur with the stage of effectively implementing it in practice. Interestingly, the challenges and practical problems mentioned above for IWRM implementation are similar to those mentioned for collaborative water governance outlined above (Merrey, Meinzen-Dick, Mollinga and Karar 2007), and also similar to the diagnosis of South Africa's water governance (Manzungu 2002; Swatuk 2005, 2008; Roux 2011; Meissner 2013a; Kemerink 2013; Schreiner 2013). Goldin (2013) identifies exclusive and still dominant knowledge regimes as restricting reform and rather cementing old networks and historical patterns of exclusion. Swatuk (2005) highlights that water policy implementation in South Africa faces difficulties in terms of devolution of duties and responsibilities of water governance to local authorities (see also Dube and Swatuk 2002; Tapela 2002). Furthermore, achieving improved access for the development of more sustainable livelihoods of those historically deprived of water remains a considerable challenge in South Africa (Laube 2011; Schreiner 2013).

The South African water governance approach was internationally saluted as one of the most progressive frameworks in the world based on IWRM (Anderson 2008), whereas its implementation faces great challenges, especially when it comes to the establishment of water governance institutions (van der Zaag 2004; Swatuk 2005, 2008; Collins et al. 2008; Wilson and Perret 2010; Brown 2013). Poor integration of existing local, traditional institutions into newly established ones led to mistrust towards novel structures of water governance or even to total refusal, as Swatuk (2005) has observed in South Africa. Similar patterns have also been discerned by Dube and Swatuk (2002) in the Sabe River Basin. Research projects in Tanzania (Ngana et al. 2003) and Malawi (Nkhoma and Mulwafu 2004) concluded that awareness through sound participation and communication strategies is essential to effective IWRM as a measure of water governance. Peter van der Zaag (2004) goes so far as to suggest that the creation of wholly new institutions in South Africa was a mistake.

In South African academic literature there exists a silent consensus that the complexity of the task to fulfil the ambitious political mandate of the new legislation has overburdened existing political administrative capacities in reality (see also Roux 2011; Mochotli 2010) and the South African

approach had tried “too much too fast” (Schreiner 2013, p. 1; Manzungu 2002; Schreiner et al. 2009). This is especially true for the inclusion of small-scale water users in newly established water user associations resulting in a lack of democratic participation and representation in decision-making processes over issues of water access and use (Seshonka et al. 2004; Faysse and Gumbo 2004; Swatuk 2005; Tapela 2011; Kemerink et al. 2013).

An internationally well-established finding is that old power differences oftentimes prevail between actors within novel institutional bodies and that established interests remain dominant to the disadvantage of small stakeholder interests (McCool 1994; Swyngedouw 2007; Molle, Wester and Hirsch 2007; Bilib et al. 2009; Ioris 2012; Kemerink et al. 2013). As a solution Shah (n.d.) suggests, “The key to successful IWRM implementation is integration of local resources and the local context”. This view is also central to this thesis’ understanding of water governance and is supported by research findings from around the globe (Rahman and Varis 2005 in India; Akpabia et al. 2007 in Nigeria, Varis et al. 2008 in Thailand and Senegal; Anukularmphai 2009 in Thailand; Bilib et al. 2009 in Chile; Varis and Lathela 2010 in India and Senegal; Ioris 2012 in Brazil; Kemerink et al. 2010 and 2013 in South Africa; Ribot 2009 in South America; Förster 2017 et al. in South Africa).

With respect to irrigation management (which is one of the main purposes of most WUAs in today’s South Africa), it seemed to be a common finding that challenges with WUAs as an institutional mechanism leading to improved access of marginalised people development are known (Brown 2014). Kemerink et al. (2011; 2013) have conclusively traced different normative reference frameworks of interacting actors and a lack of trust and commitment as important aspects for why WUAs in their study area proved to be more exclusive than inclusive to historically disadvantaged people. However, they avoid naming the underlying power asymmetries, which manifested in institutions of local level water governance.

2.5 POWER AND INSTITUTIONAL GOVERNANCE

Power is among the most fundamental ideas in social sciences (Haugaard and Clegg 2012). Understanding power is crucial to an analysis of socio-political dynamics of negotiation and decision-making over natural resource governance (Swyngedouw 2008; May 2015) as involved actors draw on prevailing formal rules and their resources and capabilities to create a certain outcome (Saravanan 2010).

Despite power being a dominant idea of social theory and a “central concept of social sciences” (Haugaard and Clegg 2009, p. 1), power analyses are highly under-represented within the field of natural resource governance (Mollinga et al. 2010; Brisbois 2015). However, they have recently regained academic attention (Berry and Mollard 2010; May 2012; Epstein et al. 2014; Brisbois and de Loe 2015). From a rather practical perspective, the 2017 World Development Report of the World Bank centred on the topic of power in natural resources governance. The authors identified a central question: how do power asymmetries manifest in governance structures and what can be the role of governance in mediating them (World Bank 2017).

However, one reason for the relatively low-level academic interest on issues of power might be the increased focus on an international level on ‘new institutional theories’. New institutionalist approaches tend to claim that by following a set of rules, norms and shared strategies within a designed and rather formal institutional environment, collaborating actors are able to keep individual selfishness at bay and thus obtain greater benefits for the group as a whole, as a collective (Dietz et al. 2002). It is assumed that actors in preferably homogenous groups - through communication - are able to develop trust and cooperation extricating themselves from ‘tragedies of the commons’ of egoistical overuse of a resource (Hardin 1968) by forming collectively binding rules (Ostrom 1993) that would prescribe certain collaborative behaviour. Such romanticised thinking about collective action often reflects Habermas (1987) normative social philosophy, which emphasises consensus and downplays conflict. In his theory of communicative action, he argues that in institutional reform and practical establishment of new institutions, power asymmetries between actors interacting within the institutional sphere can be contained and mediated “through the creation of new spaces for communication and a written constitution” (cited in Brown 2013, p. 173). Although this is highly appealing concept in a normative sense, it nevertheless leaves several important questions unanswered. What about a group of highly heterogeneous actors? What about a group of water users that is characterized by vast power differences and asymmetries in the endowment with resources and capabilities (for example information and knowledge), which are needed to access and influence processes of establishing and operating local institutions of water governance?

In recent years, new institutional approaches like theoretical frames of common-pool-resources (CPR), Ostrom’s Institutional Analysis and Development (IAD) Framework (Ostrom 2007) have gained considerable momentum in academic circles dealing with natural resources management (Epstein et al. 2014). Agrawal (2004) points out that a common feature among them is their rather implicit inclusion of power into analytical frameworks. They have thus faced increasing criticism for failing to account adequately for issues of power and inequality among actors and how they impact on processes of environmental governance (Agrawal 2013). Mosse (1997) asserts that “historically-specific structures of power rather than simply calculated pay-offs (or traditional wisdom) underlie the norms and conventions of collective resource use, and account for the occurrence and

endurance of local institutions of resource use” (p. 470). Clement (2010) furthers Ostrom’s IAD-Framework by inserting a power dimension. Brisbois (2015) and Brisbois and de Loe (2015) also argued for the centrality of power issues in collaborative water governance processes while at the same time pointing out its underemphasized character in international literature. May (2015) describes power differences between actors of collaborative governance as a reason for the often diagnosed misfit between policy on paper and policy in practice. This bears similarities to the diagnosis of IWRM-based water governance in South Africa and I will highlight this point further in the later Chapters.

The analysis of power relations in institutions of collaborative governance in this thesis has to consider contextual livelihood factors linked to water access, because “water is a resource deeply embedded in societal processes, actively deployed and regulated, shaping people’s lives and livelihoods (...)” (Mollinga 2008, p. 11). Agrawal (2004), Mollinga (2010) and Saravanan (2010) provide examples of such analysis. In their approaches it is not a hierarchical mode of command-and-control governance on separate levels of society (Kooiman 2003), but an overlapping of different levels ‘leaking’ into each other. In my analysis of the interrelation between the WUA and local livelihoods, I similarly consider macro-level policies and regulatory guidelines, meso-level institutions of collaborative governance as well as the dynamic contexts of everyday life as relevant. It is what happens within institutions between people that determines how they access and control water, but it is the local context that gives ‘what happens within’ its meaning.

Cleaver (2012) provides the theoretical ground for understanding institutions (particularly institutions of natural resource governance) beyond their design, purpose and anticipated results lined up along a set of outcome - based indicators (see also Sen 2005). Rather, she proposes to understand institutions for natural resource governance within the practical context of local realities and livelihoods. This opens up the perspective for other influential factors for outcomes of institutional processes outside the box of ‘mainstream institutionalism’ (Cleaver 2012). Franks and Cleaver (2007) highlight that designed or crafted institutions of water governance might not operate the way they were ‘designed’ to, but instead, that they represent a complex tapestry of, just to name a few, historical, socio-political and socioeconomic factors and processes deeply rooted in the local context. In other words, local institutions of water governance normatively designed to shape the outcomes of social action, in many instances rather resemble the social realities on the ground than this normative political vision.

Nevertheless, power is still often overlooked in scholarly and political discourses that focus on the question of ‘how to get the institutions right’. Maybe this is because power asymmetries have the potential to render even the most well-articulated systems of rules for good governance meaningless in practice (Förster et al. 2017). Or maybe, because it is such a contested concept that is analytically ‘hard to grab’ (Saar 2010); or maybe because power analyses are often complex and are difficult to translate into practical policy recommendations (Berry 1994)? Maybe it is all of the above. Therefore, important questions for this thesis involve: getting the institutions right for whom? And also, getting access right for whom?

2.5 THE TARPCO CRITERIA

The principles of good governance mentioned in the sections above present desirable goals to be achieved by expedient water governance institutions (Merrey et al. 2007; Karar 2008). In effect, they have been translated into South African water policy in the establishment guidelines for WUAs (DWAF 2007) and feature prominently in the NWA 1998 and the NWRS 2. Transparency is surely regarded as a central ingredient for democratic governance processes in general. It is also a practical principle of South African governance outlined in the 'Batho Pele principles'. The Department of Public Service and Administration developed the Batho-Pele principles (Pegram et al. 2006) for governance practices in South Africa and they address the transformation of public services and government institutions into authorities that put people first¹⁶ in their everyday operations. 'Openness and transparency' and access to 'information' are listed as essential for administrative-political procedures stating that every citizen should be given accurate and full information about how national and sub-national government institutions operate and which roles and responsibilities they have (Department of Public Service and Administration, DPSA 2014).

The guidelines issued by the Department of Water and Sanitation to be followed while establishing WUAs similarly list: information sharing; knowledge building; equal representation according to demographic realities; cooperation; local participation and monitoring and control as critical principles. These principles were to be taken into account within a debate to "foster a spirit of joint and participative decision-making", especially collaborating in terms of water for agricultural purposes (DWAF 2007, p. 8). As such, they resemble the well-known principles of good governance, like transparency, accountability, representation and participation of actors collaborating in decision-making over water access. They are vital for any governance process in a democratically organised state (Pollard and du Toit 2008), and they also resemble the IWRM criteria. Additionally, principles, crucial for any democratically organised state are: political legitimacy gained from collaborative processes (Brisbois 2015); the representation and participation of less well-resourced and educated people in decision-making structures (Förster et al. 2017); the existence of written rules (Habermas 1986) in the form of a structure of laws and regulatory policy guidelines, as well as the existence of written procedures and agreements on roles and responsibilities of actors, budgets and activities for the operation of decentralised institutions of water governance (Benedict et al. 2009). Furthermore, equal access to and shared control over the resource (Saravanan 2010); the resources and capabilities of state authorities to enforce the legal rules ensuring accountability and, linked to that, the existence and functioning of a dispute settlement process to resolve conflicts over water distribution (ibid.).

These categories are normative expressions describing desirable conditions and practices for 'good' or democratic water governance. However, they have also been employed as indicators to analyse institutional governance arrangements (Haider and Rao 2010).

¹⁶ In the Basotho people's language Sesotho, 'Batho Pele' means 'people first'. Principles of these codes of conduct are: consultation; service standards; access; courtesy; information; redress.

However, I also utilise them to characterise power asymmetries between actors, as empirical findings from Case 1 have clearly indicated. For example, the small-scale farmers, in both cases, complained about a lack of information and knowledge. They and other participants of this study explained that the large commercial farmers would withhold information deliberately from them (such as knowing how much water is available in the catchment and thus, how much is left to be potentially allocated). This, they described, would make it impossible for the smaller farmers to assess whether a commercial is telling the truth, by saying ‘there is no more water available’. Limited knowledge and information and largely limited openness and knowledge sharing means power in negotiating water access and distribution, allowing commercial farmers to dominate the discourse within the WUA. Furthermore, deliberately withholding central information becomes a source of power of those holding the knowledge over those who do not. Transparency is closely related to human capital of knowledge and education. Using the TARPCO criteria as an ordering framework therefore links to the Sustainable Livelihoods Framework capitals. Employing both to inform the data collection, they also contributed to investigating power of the three water user groups, because the same capitals people build on to pursue their livelihoods are the same capitals they potentially use to access and control water *in* and *around* the WUA.

Using these criteria to interrogate the institutional implementation in South Africa, also has a pragmatic reason, which links TARPCO to the research context: the criteria are explicitly mentioned in the water policy as central goals to be achieved by establishing new institutions. As such, the following themes distilled out of the literature review above¹⁷ will be used to guide the analysis and presentation of empirical data collected in order to interrogate processes of establishment and operation of WUAs in both study areas.

2.5.1 TRANSPARENCY

Internal

- Accessibility and sharing of information about:
 - procedures and rules within WUA (decision making; water distribution; payments) and the
 - roles and responsibilities of involved actors.
 - Who is responsible? Who is accountable? What criteria exist for being a member and which rights and responsibilities do members have?
- Information sharing of managers and MANCO members about the
 - overall water availability and water use patterns and
 - water allocations of members, water tariffs and the overall budget of WUA.

¹⁷ The sections above provided the relevant literature sources used to develop the TARPCO criteria. Further sources not explicitly mentioned in this Chapter, which I used to develop these themes are: Jaspers 2003; Moriarty & Butterworth 2003; Merrey et al. 2005; UNDP 2006; Tropp 2006; Jonker 2007; Transparency International Kenya 2011).

External

- Accessibility of information for affected citizens about WUA establishment procedures place is crucial.
 - Were other actors in the area of WUA responsibility informed of its establishment and operation and by which means and through which kind of media?
- Accessibility of information about operations of WUA
 - What do they do? To where do they deliver water? How much water do they control? Who gets what, when and how?
- Furthermore important are: information sharing of managers with water users supplied by WUA which are not members of WUA, and
- knowledge about water rights of others and having information about legal water access rights.

2.5.2 ACCOUNTABILITY

External

- The existence of a written set of constitutional and regulative rules on national level (legislation and policy guidelines);
- existence and efficacy of mechanisms for external monitoring of WUA operation (controlling of procedures);
- presence of strong, independent civil society organizations, including non-governmental monitors and watchdog organizations;
- political legitimacy of the internal set of rules governing water access and control are achievable and
- oversight in the form of reporting to DWS or CMA exists.

Internal

- The existence of a written set of constitutional and regulative rules for WUA establishment and operation;
- existence and use of internal monitoring mechanism and control of performance;
- accessibility of information in the allocation of water permits and user rights and the
- existence (and accessibility) of a dispute settlement mechanism.

2.5.3 REPRESENTATION

- The existence of legal provisions to be represented in national law and WUA constitution directly or indirectly;
- actual representation in decision-making structures;
- a decision-making board representative of demographics realities of local water users.

2.5.4 PARTICIPATION

- The extent to which national legal frameworks and the WUA constitution provide opportunities for participatory decision-making;
- existence and effectiveness of processes that ensure participation by key stakeholders, including sanctions for failure to facilitate stakeholder participation;
- extent to which government engages with, creates space for and supports the participation of civil society, dependent HDIs and poor communities and the
- extent of capacity of the relevant government bodies to engage with water governance processes on WUA level to monitor and control participation; and
- having a say and to make one's voice heard.

2.5.5 COLLABORATION

- Central to collaboration are an active engagement in decision-making procedures (working together to democratically reach consensus);
- working together in developing the constitution, in water planning and development, in sharing information and in distributing the water;
- influence on the outcomes of decision-making by working together in the WUA: who sets the agenda for meetings? Who calls for a vote? Who has what kind of voting right? Who else can influence the process?

I am interrogating institutional arrangements of South African water governance through the lens of these TARPCO criteria as principles for expedient water governance (Merrey et al. 2007). The question for this thesis was: how have they been achieved in the everyday water governance game of accessing and controlling water through formal mechanisms in local institutions for each of the water user groups?

In order to do this, recognizing the intrinsic connection between such governance, water access and livelihoods becomes central. The resources and capabilities needed to ensure access to water in reality, not just on paper, are determined by the success of people's livelihoods. If one doesn't have a job earning money and one doesn't have means of transport, travelling to a WUA meeting to influence decision-making over water becomes almost impossible. The success of a livelihood strategy thus (besides other factors), determines the power to participate in processes of water governance.

2.6 THE SUSTAINABLE LIVELIHOODS FRAMEWORK

The Sustainable Livelihoods Framework (SLF) provides a way of conceptualising livelihoods of people and their resources and capabilities to pursue them (Scoones 1998; DFID 2002). Initially, it was presented as an approach for practical development work with poor rural communities in order to understand the complexity of livelihoods and the multitude of factors that influence livelihood decisions. Chambers and Conway (1992) provided the intellectual inspiration. In their interpretation, a livelihood referred to the means of making a living, including tangible assets like natural resources, as well as intangible assets such as bodily health and capabilities like knowledge. It subscribes to a systematic approach trying to understand factors - named 'capitals' - that influence people's livelihood strategies in order to identify priorities for action (Carney 1998; Moriarty and Butterworth 2003). These capitals are human, natural, economic/financial, social and physical capital (DFID 1999). However, the livelihood context is furthermore influenced by a general biophysical context of climatic and hydro-geological factors, seasonal changes and certain shocks like droughts for example, which would for example affect the livelihood resource of water availability (Langridge et al. 2006). Furthermore, the SLF also considers policy, law and institutions as factors influencing the livelihood capitals (like a WUA for example) (Shankland 2000). Actors then choose a certain livelihood strategy based on available resources and capabilities, which in turn are utilised as sources of power to achieve certain outcomes in institutional processes. Translated into the language of social theory this means that agential resources and capabilities are central to pursuing a certain livelihood and that their application is influenced by structural factors of policies and law implemented by certain state actors within certain contexts. In addition, how people make money, how they potentially spend it influences the livelihoods of other people. The SLF can thus be understood as a conceptual expression of the interplay of agency and structure and the outcomes in terms of livelihood capitals as expressions of resources and capabilities of power.

The fact that livelihoods and the resources and capabilities to pursue them have crucial relevance for institutional water governance and the way such institutions work in practice, is acknowledged by different experts from the field (Nicol 2000; Merrey et al. 2005; Lankford and Merrey 2007; Mollinga 2008). Furthermore, research in different parts of the world indicates that water policies work most expediently if based on the needs of people (Moriarty and Butterworth 2003) and their livelihood strategies (Sen 1999; Anukularmphai 2009; Duflo and Banerjee 2009). Robert Chambers (1997) asked the viable question, "Who's reality counts?", arguing that the realities of the poor should establish the basis for any development strategy. The recognition has gained ground that processes of (water) policy formulation need to be based on a sound analysis of people's livelihoods the policy will impact on (Meinzen-Dick, Mollinga and Karar 2007). Similarly, in his seminal work on human rights and capabilities Amartya Sen proposes that resources and capabilities present the appropriate pivot variables for research that concerns human dynamics of resource governance (Sen 2005, 2009; conf. also ODI 2001). As this is true for governance, policy or strategy development, it is even truer for an analysis of already existing institutions implementing South African's water policy, which explicitly builds on the concept of sustainable livelihoods and declared "the development of sustainable livelihoods" as the overarching goal of the post-Apartheid water legislation (NWPR 2013, p. 9).

The centrality of the SLF to this thesis' analytical thinking, is also expressed through the remarkable resemblance of resources and capabilities to categories I use to conceptualise and operationalize power. In Ribot and Peluso's (2003) 'theory of access' for example, power is understood as "the ability to benefit from things". 'Things' include material objects, persons, institutions, and symbols constituting a web of access, through which actors make use of certain 'mechanisms' to access water. These mechanisms are sources of power. They refer to technology, financial capital, markets, knowledge, authority, social identity and social relations that can shape or influence access and assign the actor a position in a web of power embedded in certain contexts (Ribot and Peluso 2003; Ribot 2009). Their concept of 'mechanisms' resembles the idea of 'capitals' in the SLF and both mirror different theoretical ideas of what constitutes power.

Nevertheless, the SLF shows some conceptual shortfalls regarding the link between policy and livelihood capitals, relating to what kind of institutions the SLF refers to and how 'access' to certain capitals is characterised (see also de Haan and Zoomers in 2005). Another point of critique is a limited differentiation between the capitals, as well as a possible interrelation between the capitals (Shankland 2000). However, resources and capabilities are not static or rigid categories. They are conceptual categories describing a dynamic and rather 'fuzzy' reality; as such, they overlap in practice. In practice of everyday water governance, an interrelation of certain resources and capabilities exists (Sullivan et al. 2003a). The human capability of adequate health for example enables a member of a poor community to physically attend a water forum or a meeting of a WUA; in turn, attending this meeting might improve this persons' knowledge, seen as human capability, which again might empower her or him to participate in future meetings more meaningfully (Berry and Mollard 2010; Goldin 2010). These interconnections are taken into account in my later analysis of the research findings concerning power.

Another limitation of the SLF is the lack of a conceptualisation of 'access'. Access to resources and capabilities to make a living are considered crucial in the SLF, but this role is not sufficiently accounted for. Franks' and Cleaver's (2007) approach to institutional analysis from an agential perspective also focuses on an interrelation of resources and capabilities of an individual or group to make use of certain 'mechanisms of access'. These mechanisms are understood as the "processes by which water access is negotiated and shaped within various governance arrangements" (p. 295), which in turn shape the outcomes for actors of water governance (see also Saravanan 2010; Clement 2010). Using the SLF has been defined by Shankland 2000 (p. 7) as "the processes of identifying the resources and strategies (...), the context in within which they operate, the institutions and organisations with which they interact and the sustainability of the livelihoods outcomes which they achieve, provide a way for picking through a path through the complexity at the micro level." In other words, the SLF focuses on individuals and groups, agents, and puts them into relation to policies, legislation and institutions. This also fits well with the policy language of the South African government and the national water legislation.

As such, using the SLF presents the 'conceptual entrance' to the micro level of this research investigation, while linking it the macro level of water governance policy and law and a meso level of state institutions such as Catchment Management Agencies of Water User Associations. This is displayed in the conceptual framework at the end of this Chapter.

2.7 FRAMING WATER ACCESS AND POWER

Access to water is also widely recognized as a prerequisite for poverty reduction and socioeconomic development (Sullivan and Meigh 2003; Kulindwa and Lein 2008), but in today's complex and changing world, competition for water from many different sectors can divert attention from its crucial role in the improvement of human livelihoods of poor people (Kramm and Wirkus 2010). It is all too often neglected that access to water is a vital necessity for human well-being (Llamas and Rogers 2005). It has been shown that the access to rather intangible goods for the basic human needs of adequate water, food and shelter; and to enjoy good health are fundamental capabilities of human life (Sen 1983, 1999, 2009; Nussbaum 2013; Rosa 2013). Based on her extensive field research in South Africa, Goldin (2013) also identifies as central ingredients for social development and sustainable livelihoods: being informed, being able to read, write and communicate, as well as the capability to choose a strategy in life that one has reason to value.

However, in formal, institutionalized systems water access is - to a certain degree - controlled through a structure of legal prescriptions - the rules of the game. Two dimensions of water access are central: the first dimension is a rights-based access resting on a legally justified claim, i.e. a legal water entitlement. Concerning water access, formal property rights come into play. Property rights can be seen as a social relationship between a right holder, other people, and an institution to back the claim (Meinzen-Dick 2008). In many cases, such claim derives its legitimacy from statutory law. However, even a socially acknowledged claim over a certain amount of water, needs the ability to realize such claim in everyday practice, whereas formal laws are often utilized to control the resource and patterns of distribution (Ribot 2004).

Boelens (2008) has developed ideas describing access and control in relation to rights based on his research findings in Andean irrigation communities.

Table 1: Water rights and attached privileges (adapted from Boelens 2008)

Access and operational rights: access to water and water infrastructure	Control rights: right to take part in collective decision-making
Right to withdraw and use part of the water flow.	Right to take part in decision-making about management and system operation: decision concerning water distribution; irrigation schedules; flow rates; water use purposes; organisational forms; organisational forms; post and responsibilities etc. - within the frameworks of the systems regulatory arrangements.
Right to use the water infrastructure to obtain water and direct to a community or farm plot.	Right to take part in decision-making about the inclusion and exclusion of members.
Right to access information on the management of the system.	Right to take part in decision-making about changing or expanding the hydraulic system and irrigation technology.
Right to be eligible and to occupy positions in the water users' organisation, to represent users, and to implement decisions regarding water distribution and management, including punishment and enforcement or rules following infringement.	Right to take part in decision-making about transferring the rights to use part of the water flow, the source itself or the hydraulic infrastructure, to third parties.
Right to take part in cultural, organisational and political activities related to the water management.	Right to take part in decision-making about changing the internal rights and regulations.

This table surely contains relevant elements to any organisation or institutional form of distribution system for natural resources. However, what I point out is the role of rights in this regard. Boelens (2008) generally strongly emphasizes the centrality of people's social and cultural connections while exploring water access and control; this table, however, overemphasizes the role of rights. With or without rights, people access water every day irrespectively whether a powerful entity labels this legal or illegal.

With legal and formal systems being in place, people access water 'informally' or 'illegally' everywhere on this world. In many cases, mostly for the poor and marginalized on this planet, this is because they have no other way of obtaining water (UNDP 2000). And legal systems are by far not the only and not necessarily expedient systems of ensuring access to water resources, because only the existence of a dominant narrative of something being 'formal' and 'legal', the water access practices of others are framed as the opposite. Traditional water rights and customary systems that have emerged over hundreds of years before the introduction of any formal laws (for example in the case of South Africa or Australia) and they are crucial regulators of water rights. In other words, the fact that an entitlement or right to water rooted in the local, cultural or spiritual context (or being 'informal') and thus not recognized by the legal system of rules, does not make them less real for people in their everyday livelihoods (Missingham 2011). However, in many instances, besides having

legal water use rights, having access to means of distributing the water are also crucial. The legal dimension plays an important role here, because often the access to physical distribution infrastructure is coupled to the ownership of land: holding legal land rights within an irrigation system means access to water (see also Kramm and Wirkus 2010).

However, a fundamental requirement for obtaining water within a formal institution is information and knowledge about how this institution works according to a set of legal rules. In order to realize one's rights, one must know about their existence in the first place, and then how to use them for one's benefit. Knowing the rules, after which the game of water access and control is played, means power, as I will show in the following chapters. For people living in remote rural areas for example, or in areas where no formal schooling system exists, or the people who are unable to afford education, such knowledge is power in negotiations about water. Furthermore, the poor often lack other basic resources and capabilities to do 'things' or to be involved in processes, for example to participate in such negotiations (in a Water User Association for example), simply because they lack the physical means of transport or the financial resources to pay for local transport (Goldin 2013; Förster et al. 2017). Surely, the ability to travel to a water authority or a meeting is just as important as the ability to read and write to fill out a form to order irrigation water. Also, if no connection to the distribution infrastructure exists, the knowledge of how to fill out the form is likely not to result in actual physical access to water. In summary, a legal right means little, if a person does not have the power to realise it in everyday practice. With the words of social theory, the structural dimension of water governance needs agential resources and capabilities to be realised in practice.

With recourse to Giddens (1984), rights, legal structures of rules and actors' resources and capabilities, influence, in concert, water rights on paper and also, how they are enforced, complied with, adapted, manipulated, circumvented or ignored in everyday practices. This interaction between structure and agency stands at the core of how societies, grand and small, function (see also Archer 2000). It is thus not surprising that ideas of property rights, collective action, decentralized institutions or participatory and collaborative water governance have emerged as central issues in policy debates and development initiatives around water. However, social relations stand at the heart of any water institution, organization, agency, association, community, and group or in between two people. This also brings in relations of power, because such water rights and the processes involved in their potential realization in the practical context of local institutions (such as Water User Associations) also organize the exclusion or inclusion of actors. However, such institutions are also fundamentally shaped by those processes, and thus a result of the way power is organized in the practice of water governance (Cleaver 2012). In their 'Theory of Access' Ribot and Peluso (2003) argue that property as a 'bundle of rights' refers to socially acknowledged claims, but that a bundle of rights is only one factor in a larger array of institutions, social and political-economic relations, and strategies that shape natural resource access. Access in this thesis thus follows Ribot and Peluso's (2003) definition as "the ability to benefit from things". In other words, an actor must have the power to access water; and as such, access is rather a 'bundle of powers' than a bundle of rights.

Empirical findings from both cases will reveal power as a field of force oscillating within the space between structural, agential and contextual sources of power that actors draw upon to influence the game of water access and control in local water governance in South Africa.

2.8 POWER THEORIES

The operation of power can be thought of in several ways: power as domination of a person or a group over another by influencing their power-base (power-over) (Dahl 1957; Weber 1978); power as capacity for action (power-to) (Parsons 1963; Ahrendt 1970; Moriss 2006; 2009; Saar 2010) and power inherent in certain societal structures and networks, as well as in certain processes (power-within) (Galtung 1968; Barbalet 1987; Gaventa 2005; Mann 2012). Social relations of power can be direct and specific (Dahl 1957), or rather indirect and invisible (Lukes 1979) and socio-politically complex and omnipresent (Galtung 1968).

This links to theoretical approaches to power to social theoretical thinking drawn upon in this thesis. A social-philosophical nature of power has often been thought as arising from the perceived collision of a certain socio-political order and individual subjects or groups (Saar 2010; Galtung 1986; Swyngedouw 2008). Philosophical debates on what is and what constitutes power have thus been located at the intersection of societal structures and individual (or group) agency (Kaspersen 2007). The formation of some kind of political order and the social action that it is supposed to bring order to, are in the centre of philosophical discussions on power for centuries (Saar 2010). As such, power as the axiom of structure and agency is “represented in practically all sociology” (Barbalet 1987, p. 1).

However, a linear understanding of power as domination in which instance, according to Dahl (1957), A forces B to do what B would not otherwise do; or power understood as “A affects B in a manner contrary to B’s interests” (Lukes 1979, p. 27), is prominent. Power as domination has the negative connotation of a zero-sum game (Parsons 1963). Power of one person or group is mostly seen as or resulting in another persons’ or group’s loss. This is clearly an expression of power. However, an understanding of power as capacity¹⁸ for action has a more comprehensive and more positive focus and is thus more suitable to be used in research that deals with wicked problems of water governance through formal institutions. Saar (2010, p. 9) has for example argued that an eclectic understanding of power is necessary, because “the operation of power takes place in many different ways” reducing the explanatory weight of any mono-causal concept of power. Accordingly, this thesis follows Foucault’s notion that power is a “multiplicity of force relations” (Foucault 1978, p. 9). Similarly, power has often been pinpointed as manifesting itself as a web or a matrix of power (Galtung 1968; Lukes 1979) that is made up of different clusters (Haugaard and Clegg 2009) or different bundles of power (Ribot and Peluso 2003). To conceptually cater for this notion, I argue that power is highly contextual and that one way to exercise power is to create conditions or control circumstances in which others have to act (see also Barbalet 1987). A plural understanding of power as outlined above fits the complexity of multifaceted social realities of wicked problems and neatly links to the dualistic concept of structure and agency. In other words, the rules of the game are crucial, but it is its players who give them meaning and relevance in everyday practices. This furthermore is in line with this thesis theoretical view on institutions of water governance as highlighted above.

¹⁸ Capacity in this thesis I have defined as the potential for action determined by the endowment with resources and capabilities to do something.

In the following, I present a theoretical synthesis for the analysis of power relations in collaborative institutions of water governance. In doing so, three types of power are introduced for this thesis: structural, agential and contextual power used to access and control water. These are used to systematically organize each of the third subchapters of both case studies.

2.9 STRUCTURAL POWER

This thesis adopts Giddens' (1984) notion that rules, are best understood as "procedures of action, aspects of praxis" (Giddens 1984, p. 21). This implies that rules have the potential to guide social action including the control of power relations among agents or actors by other agents enforcing such rules (Saar 2010). Borrowing from Barbalet again (1987, p. 31), exercising structural power means to "create conditions or control circumstances in which others are implicated". I also call this shopping-mall-power, the power to set circumstances in which others have to act. Elaborating on this metaphor of a shopping mall, malls are built after a construction plan that allows for visitors to explore the shops on predetermined routes. If someone goes out on a Sunday shopping tour into the nearest large shopping mall, he or her cannot walk around freely; the movements are controlled by those who built the shopping centre in the first place: they have conceptualised the ways in which they allow people to walk through this centre, regardless of whether the visitors are aware of this. In large IKEA stores all around the world, for example a visitor is forced to take a certain route through the store: after passing the bathroom section, he or her needs to pass the kitchen section and afterwards the office section and so on before 'being allowed' to exit.¹⁹ Influencing the context in which other actors act is thus a form of power and can 'act in concert' with other forms of power (Mori 2003; Bressers and De Boer 2013).

However, I also acknowledge that legal rules and guidelines can be a source of power. Rosenau (1990, p. 186) for example describes authority as akin to power. Authority relations for him are "patterns of [an entity] wherein some of its members are accorded the right to make decisions, set rules, allocate resources, and formulate policies for the rest of the members, who, in turn, comply with the decisions, rules and policies made by the authorities". However, I understand this definition not as describing authority, but power. To 'make decisions' and to 'set rules' which others have to comply with is not merely expressing authority, but genuine power (see also Brisbois 2015). This is what Barbalet (1987, p. 1) calls "structural resources" of power and is evidenced by the notion that powerful agents might be able to 'play the game' of supposedly collaborative water governance more skilfully. This might be because they have sound knowledge of how to use the rules of the 'game' to their advantage; and/or because they had set such rules themselves upfront creating a system of rules under which others have to act. Powerful agents might also re-interpret these rules in their practical application in a certain context (Saravanan 2010).

¹⁹ After many customers complaints, the company of IKEA built 'shortcuts' into its stores that allow bypassing on section, but the signs for such ways were well hidden and relatively small. However, without knowledge about such shortcuts, a typical visitor would take the long route through one section.

However, rules are viewed by Giddens (1984) as both constitutional and regulative. Subsequently, rules in this thesis describe codified laws that constitute, for example, what kind of legal entity a WUA is and what its mandated functions are, but, more importantly, address regulative rules for establishing a WUA in the first place. As such, these regulative rules are the codes of conduct for socio-political processes. In this regard in the South African water legislation the most important legal documents regarding WUA establishment and operation are the National Water Act 1998 and the model Constitution for WUAs in the country. The former advises that the latter is developed as a result of collaboration of involved users. Furthermore, criteria to be followed in the establishment processes of WUAs were issued in the form of policy documents such as the National Water Resource Strategy 2 and the Establishment Guidelines for WUAs, which are reviewed in Chapter 5.

Linking this further to the South African context, the idea for the over 90 Water User Association established in South Africa was that a WUA is an institution of local water governance: it in-states for example a set of rules for decision-making, sets rules for voting rights and the number of votes for its members through its Constitution (which in itself draws legitimacy from the National Water Act 1998) and ensures the distribution of water through operating an either state-owned or privately owned irrigation scheme. In the same light, its establishment and operation draws upon two dimensions: first, a structural one comprising national law, policy implementation guidelines issued by the DWS, as well as its internal constitution; and second, an agential dimension of the resources and capabilities endowed to each actor or group of actors deciding over the access, control and distribution of water. The third dimension is the context in which actors interact. As such, Water User Associations in South Africa were established and are operating according to a set of rules. These rules stem from a) the National Water Act and the National Water Resource Strategy 2 (constitutional rules), b) from guidelines and principles for WUA establishment and operation issued by the Department of Water and Sanitation (constitutive/regulative rules) and c) from the WUA Constitution regulating who is allowed to become a member; who is represented in decision-making on the Management Committee, as well as the setting of voting procedures and individual voting rights (regulative rules). Again drawing on Giddens (1984), both, constitutional and regulative rules are labelled authoritative structures in this thesis, because the South African state in the form of the DWS is the politically mandated authority to establish such rules and institutions. The Management Committee (MANCO) of a WUA is thus actually part of the government. The question for this thesis was thus: to which degree have the actors been able to influence the development and formulation of constitutive and regulative rules?

2.10 AGENTIAL POWER

This thesis conceptualises agents as actors endowed with resources and capabilities to act in a certain way. In this sense, agency in this thesis does not refer “to the intentions people have in doing things, but to their capability of doing those things in the first place” (Giddens 1984, p. 15). For Morris (2006; 2009), as for Clegg (1989), also like Foucault (1978), power is a concept of resources and capabilities, which are actor-inherent as well as a result of the situatedness of an individual (or group) within socio-political contexts. For Clegg (1989, p. 19) “actors are situated beings”, who would find themselves in processes of social interaction in institutions that “are constituted by the rules of the game” (see also Haugaard and Clegg 2012). Correspondingly, “agency relates to action” and “action depends upon the capability of the individual to ‘make a difference’ to a pre-existing

state of affairs or course of events” (Giddens 1984, p. 14). In other words, agency is related to power, and such power depends on the strategic deployment of a combination of structural and agential resources and capabilities embedded in a certain context.

I propose a resource as a materialized or socially derived something that actors can draw upon to achieve a desired outcome. These resources can be: financial (money) and physical (for example a computer, means of transport) (Ribot and Peluso 2003; de Haan and Zoomers 2005). Another important physical resource in the South African context is land, because the access to land oftentimes still determines access to water (Förster et al. 2017). Furthermore, I suggest that social connectedness (social capital in the SLF, degree of organization around issues of water amongst a group of actors) is a socially derived resource, because it enables actors in water governance to pool their resources strategically before and within negotiations around water access (Saravanan 2010; see also May 2015). Capability describes a physical or cognitive ability to act (see also Franks and Cleaver 2007; Sen 2009). Knowledge is *the* central cognitive ability of individuals and groups in decision-making procedures around water, as the existence or non-existence of knowledge may enable or constrain meaningful participation or collaboration (Goldin 2008).

Agential sources of power I define as the resources and capabilities available to a person or group to do something (power-to). This is further differentiated into theoretical categories relating to the livelihood categories of the three water user groups. I have thus operationalized the well-known categories used to analyse people’s livelihoods (human, social, economic, physical and natural) of the Sustainable Livelihoods Framework to also provide themes for the analysis of their agential sources of power. This is because the categories used to analyse livelihoods resemble the categories of power prominent in international scholarly literature dealing with power in its various forms. However, practically, this power is drawn upon by people to do something. ‘Something’ can be exchanged with a process relevant in everyday water governance, for example ‘accessing information’. Information, however, can only be actively accessed by using physical or social resources and capabilities, such as technology (computer or smart phone), means of transport (to drive to the next government authority to obtain information) or through social channels (using other people’s knowledge).

To put it differently, a piece of information about water legislation in South Africa needs to be understood and used in order to become a source of power. For example, without the human capability to read legal texts in the English language and to understand the legal ‘nitty-gritty’ contained in the paragraphs this piece of information is hardly usable. Furthermore, if a person does not possess knowledge contextualising this piece of information, for example the knowledge about the process of a WUA establishment in the catchment he lives, he will likely not read the Act with an expedient focus, because he has nothing to apply his knowledge to. The power to do something is thus constrained by the context in which it occurs. In principle, the function of eliciting a desired social behaviour of following the rules for the benefit of a common social order is associated with legal rules. Nevertheless, as I will show in the following sections, this depends on the actors in water governance and the context in which they act, rather than on the rules that seek to prescribe such behaviour.

2.11 CONTEXTUAL POWER

Power is embedded in local contexts and local contexts can be a source of what Lukes (1979) describes as 'invisible power'. Every day social interactions of controlling and accessing water in WUA-based water governance are characterised by a kind of diffuse power embedded in the livelihood contexts of local actors or agents. As Clegg (1989, p. 359) convincingly argues: "power is not simply a thing vested in a specific person or agency but a field of force (...)". This makes power 'invisible' in some instances as some interests might be directly or indirectly "privileged by certain structural conditions without having to actively exercise power, thus rendering power hidden or invisible" (Brisbois 2015).

Historical legacies, social and political coalitions and behavioural patterns of local actors of water governance have proven to be quite persistent under the coat of new institutions. In other words, the well-trodden behavioural paths of, decisions-making, coalition building, agenda setting and administrative procedures will likely be 'walked again' as an interplay of involved actors and established contextual factors in a new institution. In economic theory, it is emphasized that the costs for staying on a certain path are lower than alternating behaviour and for example, administrative processes (Pierson 2000). In a sociological understanding institutions are also understood as self-enforcing systems, with rules becoming increasingly taken-for-granted (Clemens and Cook, 1999) which function as 'the way to do things'. Reproduced by other actors they will over time become 'the way we have always done things' becoming an un-outspoken 'order of things' and present a kind of invisible manual of social action (see Thelen 1999). This 'way we have always done things' also relates to historical patterns of production and labour relations between those offering their work force and those, who take it enumerating the person initially offering his or her work force. It surely also relates to the questions of: how owns the land? Who owns the production capital and the natural resources needed to produce something? All this creates a context of social, economic and political patterns of 'how things are done' that is reproduced through repetition.

Another form of contextual power refers to the ability of some actors to influence the circumstances, which shape the resources and capabilities for social action of others. In this thesis this means, to directly influence the livelihood capitals of others. However, such contextual power is expressed through notions of power that arise local historical and socioeconomic patterns. Thus, contextual power manifests as a function of structural and agential sources of power (ibid.).

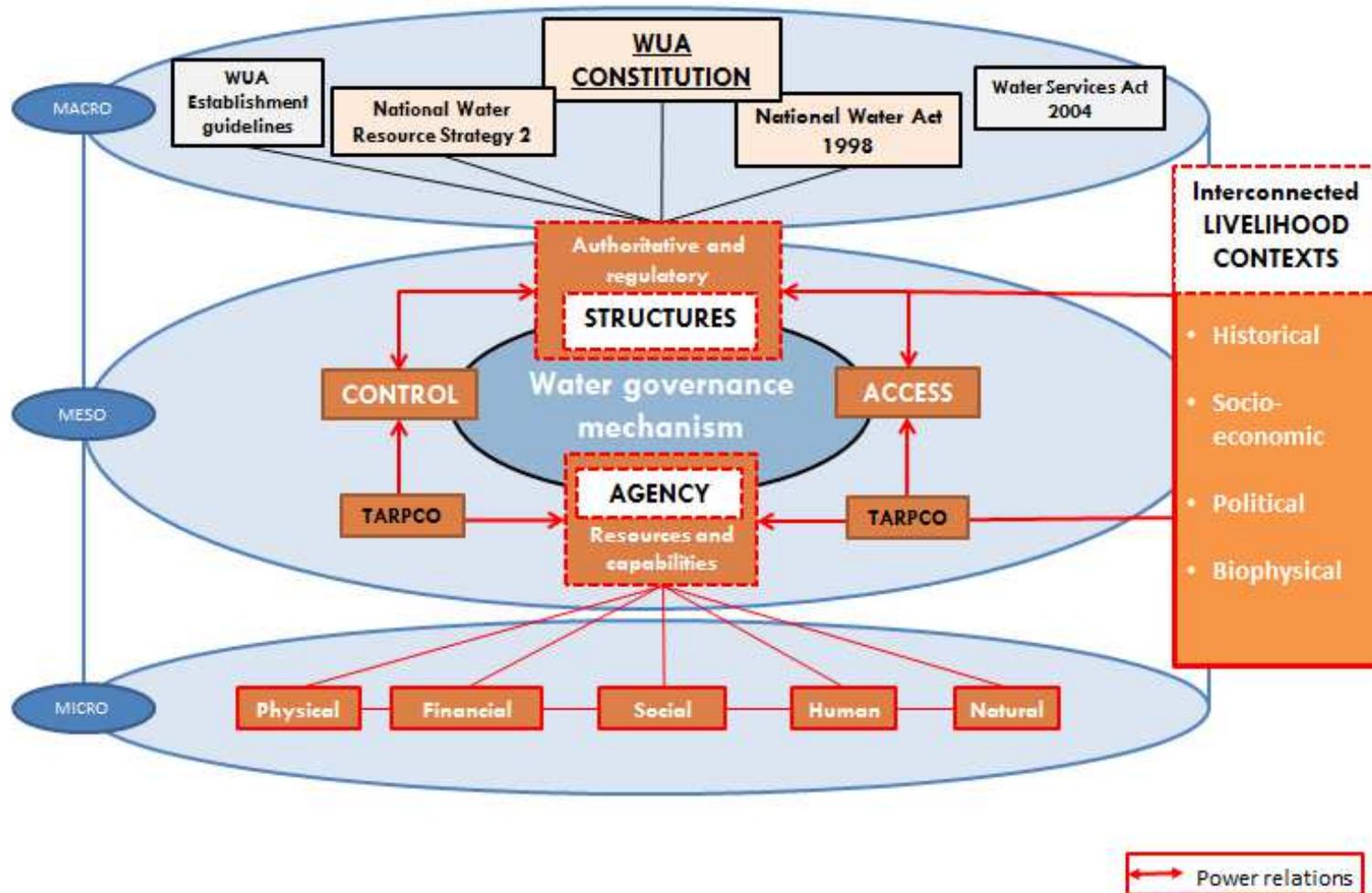
In summary, the concert of power in this thesis consists of the following elements. The 'power-to' (agential power) is represented by the livelihoods resources and capabilities to do something. The use of such power to create structures, in which others are implicated and utilize this for one's benefit, is the 'power-within' (structural power). The power to influence the livelihood capitals of others by directly or indirectly influencing the general context in which these livelihoods are pursued - and with it the success of such strategies - is the 'power-over' (contextual power). All three represent a 'field of force' (Clegg 1989), in which in the game of accessing and controlling water unfolds.

2.12 CONCEPTUAL FRAMEWORK

In the following, I present a synthesis of the above theoretical concepts merging them into a core conceptual framework for this research. As such, it uses the social theoretical concepts of structure and agency within the context of this thesis, while adding the third concept of context. *Agency* represents an umbrella term summarizing the livelihood resources and capabilities of the three water user groups in a theoretical category. The Sustainable Livelihoods Framework for researching the resources and capabilities has its expression in the categories on the micro level. It shows the resources and capabilities that the three major local players of the game of accessing and controlling water draw upon as sources of power to influence social processes of decision-making about water. These processes (to a certain degree) are shaped by the authoritative rules of the game, legally prescribing certain behaviour of collaboration. These rules are the main pieces of water policy and legislation prescribing how WUAs as central local institutions of South African water governance were anticipated to work (*structures*). How they work is furthermore influenced by the practical implementation of the TARPCO criteria, which are central benchmarks for the South African water governance. The *context* describes the situation in which the game takes place. This relates to the historical legacies of the Apartheid era, manifested and still prevalent in socioeconomic patterns of production and labour relations, infrastructure ownership or the post-Apartheid re-organisation of political-administrative units into municipalities for example. The negative biophysical consequences of large-scale agricultural production, such as groundwater overexploitation and salt-water intrusion, for the common social order are also considered. This becomes important especially for Case I of the Hex River Valley.

However, the categories used in this framework link the theoretical approaches discussed above to the research context on the ground. This follows my thinking of connecting theoretical ideas to each other, while staying in close conversation with 'the real world'.

This is detailed in my research approach following the framework below.



Sources (inter alia): A. Sen 1981; Giddens 1984; Barbalet 1987; Chambers & Conway 1992; Scoones 2003; Ribot & Peluso, 2003; Morris 2006; Swyngedouw 2006; Saar 2010; Cleaver 2012

Figure 1: Conceptual framework

CHAPTER 3 - RESEARCH APPROACH AND METHODS

This chapter is divided into six sections. The first section outlines this thesis' philosophical underpinning. Elaborating on subsequent methodological implications, the second section explains the research strategy in relation to research context and research problem. The third section illustrates this thesis' multiple case study research approach. Expounding the methods used to investigate power in institutional water governance within and across the two cases, the fourth section presents techniques of data collection, explains the selection of cases and interviewees and gives practical insights into the process of interviewing a diverse range of participants in the field. The fifth section explains the methods used to analyse and interpret the gathered data from a cross-case perspective. Finally, I briefly elaborate on social-scientific robustness of this thesis research strategy.

Table 2: Summary of research design

PRELIMINARY THESIS TITLE	Ruling the Game: Power in institutional water governance in South Africa. A cross-case analysis of water access and control.
CONTEXT	Post-Apartheid South Africa's water governance approach, its implementation through regional and local water governance institutions, and how this connects to local people's lives on the ground.
RESEARCH QUESTION	How do local water users employ their resources and capabilities as sources of power to access and control water using formal and non-formal mechanisms of water governance?
PROJECT OBJECTIVES	<p>This thesis objectives were to:</p> <ul style="list-style-type: none"> • explore the overarching water governance structure in South Africa; • examine the livelihood context of three water user groups and explore the actors' resources and capabilities; • investigate characteristics of establishment and operation of the institutional access mechanism; and • provide an analysis of how the three water user groups use their resources and capabilities as sources of power to access and control water.
STUDY AREA	<p>The study areas for this research were:</p> <ul style="list-style-type: none"> • the Hex River Valley in the Western Cape Province and • the Groot Marico catchment in the Northwest Province of South Africa.
METHODS	<p>Embracing realist-interpretative ontology this research applies qualitative research techniques of:</p> <ul style="list-style-type: none"> • document analysis; • semi-structured, in-depth interview guidelines; • direct observations; • participatory mapping techniques; and • transect - walks in the field.
OVERALL RESEARCH DESIGN	<p>The overall research design is a</p> <ul style="list-style-type: none"> • qualitative, multiple case study.
THEORETICAL LENS	<p>This thesis draws upon</p> <ul style="list-style-type: none"> • social theory; • institutional theory; and • power theories.

3.1 PHILOSOPHICAL UNDERPINNING AND RESEARCH STRATEGY

This thesis adopts a qualitative research strategy while embracing a realist, interpretivist ontology (della Porta and Keating 2008). I hold the view that social action is always complex, dynamic and determined by multiple and contextually different causal relationships (Rittel and Weber 1973; Levi-Faur 2005). Furthermore, I employ a perspective of 'intersubjectivity' as an alternative notion in between the assumed objectivity of objectivist/positivist approaches and the natural subjectivity of constructivist approaches (Morgan 2007). In this thesis, I hold the ontological view that the world exists independent of our knowledge from it, but that different individuals interpret the world, which they are part of in their own unique way. This approach is also labelled as pragmatic (Denscombe 2008), as pragmatic approaches respect that academic and practical knowledge are complementary. Not rejecting a certain cognitive 'constructedness' of social realities, I hold the view that the 'real world' of social phenomena can be discovered by interactive, participative methodological means based on a systematic approach (Schwandt 2007).

Similarly, Denzin and Lincoln (2000) highlight that qualitative research involves an interpretive and naturalistic approach, meaning that researchers embracing a qualitative approach, study things in their natural settings in an attempt understand and/or interpret and/or explain phenomena through the eyes of people and the meanings they bring to these phenomena. Within this realistic notion, I use an interpretative approach to gain a fine-grained understanding of the social matter of power in institutional water governance.

The practical research was non-manipulative and non-controlling, except using interview guidelines to structure the interviews with participants (USC 2016). I also used an adaptive research strategy accepting that the inquiry might need to adapt as my understanding of the matter would change or even in the case that the research context changed, while the research was still on-going (Fouche and Schurink 2011). Thus, I avoided an overly rigid design for the interview guidelines, because a rather inflexible structure involves the risk of a priori eliminating the researcher's capacity in responding to emerging opportunities and following alternative paths of inquiry and discovery as they surface from the process of data collection (Frey, Botan and Kreps 1999). The results of this research are regarded as transferable and the scientific research approach, methodology and theoretical framework as replicable and comparable with the recognition that all knowledge is context-dependent.

Furthermore, this thesis adopts a pluralistic view on reasoning and causal explanation. I am following a path of distal causation, which tries to explain human social behavior by considering the larger context in which individuals or groups carry out their actions (Mills 1959). Proponents of the distal view of power argue that power can be direct and concrete, while also operating at a more abstract level in the society as a whole (e.g. between economic classes and between the employers and the employed). Thus, I will show that whilst individuals in this study occupy roles and statuses relative to each other, it is the societal structures and institutions in which these exist that are an important cause of behavior. For example, a human biography can only be told in relation to societal structures, yet it also must be told in relation to unique individual experiences in order to reveal a complete picture (ibid.). This approach becomes apparent in Chapter 5 and 6, in which I tell the story of three water user groups in relation to each other, while considering the societal structures and socioeconomic contexts in which this story unfolds. This also links neatly with my nested theoretical frame using complementary theoretical concepts to construct one theory frame (Rueschemeyer 2009). However, apart from ontological, theoretical and epistemological preferences, the research problem identified and the contextual realities on the ground should determine the research methods chosen (see Mollinga and Gondalekhar 2014). This link between research problem, research question, real-life context and the methods chosen I explain below.

The research question of this thesis was:

“How do local water users employ their resources and capabilities as sources of power to access and control water using formal and non-formal mechanisms of water governance”?

The primary objective of this research project was to investigate the institutional mechanisms through which local water users access water for productive purposes, how institutional mechanisms shape that access, and how these processes relate to their livelihoods. The research problem of this thesis I identified as the dysfunctionality of the formal institutional mechanisms (WUAs) on local level, which governs water access of heterogeneous actors, struggling to achieve its aim to “radically transform water access” (NWPR 2013) for the poor and marginalized.

In Case I of the Hex River Valley, a supposedly collaborative mechanism for water governance - the WUA - had been established in the Valley. Governing mainly irrigation water, it was also functioning as a Water Service Provider (WSP) for part of the poor settlements in this Valley. On regional level, a Catchment Management Agency existed governing water planning and development while supposedly overseeing other water institutions, such as WUAs.

In Case II, neither a CMA nor a WUA was established since 1998 and irrigation water was accessed through the local office of the Department of Water and Sanitation, while water supply and sanitation remained the responsibility of the local municipality. This provided a unique opportunity to explore similarities and differences between mechanisms of water access and the outcomes for local livelihoods across the cases. It was the main reason for selecting these two cases for this study.

3.2 RESEARCH APPROACH: MULTIPLE CASE STUDY

Qualitative case studies claim a central position in social sciences (Ragin 2008). They allow researchers the possibility to explore a phenomenon in context using a variety of data sources (Flyvberg 2006). Yin (2014) elaborates that a case study approach should be considered when a), the 'Erkenntnisinteresse'²⁰ of the study involves 'how' and 'why' questions, b) the behaviour of interview participants is not actively manipulated, c) contextual factors are given close attention as they are inseparable from the phenomenon under study and d) the boundaries between context and phenomenon are not clear.

My research approach fits these criteria, because I explore an individual/group dimension focusing on the livelihoods of three user groups: large-scale commercial farmers; so called, black emerging farmers and poor people living in poor settlements (or in Case II also in remote rural communities) practicing small-scale subsistence farming mostly in backyard gardens. I explore how these three user groups draw upon their resources and capabilities as sources of power to access and control water for productive purposes through institutional mechanisms of South African water governance, and analyse, how their actions influence the resources and capabilities of other actors. A case-based approach fits this research context on the ground. I have not actively manipulated the interview participant's behaviour in any way and the phenomenon under study is not only highly context dependent, but, as I will show, contextual features play a major role in how people use their power to access and control water (see also Strydom and Bezuidenhout 2014).

Different types of purposes for choosing a case study approach exist. A case study that investigates a certain social phenomenon in situ is frequently called exploratory (Yin 2014) or instrumental (Mark 1996). Another type is the descriptive case study (Yin 2014), oftentimes used in social anthropology to prepare an in-depth and thick description of the cultural life of a certain group of people. If the 'Erkenntnisinteresse' is to explain a certain social phenomenon one might call the case study explanatory (ibid.). However, in practice, especially in social science research, these categories overlap. The purposes of explaining a specific access mechanism of water governance with regards to livelihoods, I argue, is not possible without an empirically fine-grained understanding and thus some form of description of the matter and the context it is embedded in. Furthermore, I ask, can research in social sciences try to understand a certain matter without exploring it in the first place? In addition, an attempt to explain a certain phenomenon is hardly possible without these previous steps.

²⁰ The term 'Erkenntnisinteresse' in German language is constructed out of two nouns: 'Erkenntnis' and 'Interesse'. Interesse means 'interest', whereas Erkenntnis stands for 'understanding', 'finding' or 'insight'. In the absence of an adequate English word, I chose to use the word 'Erkenntnisinteresse'. Thus, the term usefully describes the interest of a researcher of what to find, what scientifically excites him and simply what he wishes to know more about.

I employ the research approach of a multiple case study to produce detailed analytic descriptions of power relations in the game of accessing and controlling water. According to Yin (2003), the multiple case study approach is used to investigate findings within and across cases for similarities and differences. As such, I investigate local level social dynamics in two places where WUAs were supposed to be established, and take these two contrasting situations to learn from them about power in formalised water access and control. The comparative element comes into this research by analysing the empirical evidence from both cases in a cross-case perspective using the same analytic themes and categories of the Sustainable Livelihoods Framework (SLF) to inform data collection and analysis in both cases. However, comparison here is rather a comparison by contrast. I use the goals of the South African water policy reform as benchmarks and contrast them with findings from the field. Relating to this, I use the TARPCO in combination with the SLF as an ordering framework to inform data collection, analysis and to organise the Chapter's findings systematically. In addition, I discuss the findings from both case studies in the light of institutional theory and theoretical approaches to power.

Mills, van de Bunt and de Bruijn (2006, p. 3) describe: "comparative research is used to separate patterns that are more general and isolate regularities from the context-laden environment. Following Weber's comparative sociology, the search for variance places more emphasis on context and differences in order to understand specificities." However, I contend that context and specificities are hardly separable from each other and both have to be part of the analysis; thus 'isolating regularities from context' per se is not a desirable goal. Rihoux (2006) for example argues that empirical social science often involves two conflicting goals: "On the one hand, one seeks to gather in-depth insight in the different cases and capture the complexity of the cases - to gain intimacy with the cases. On the other hand, one still wishes to produce some level of generalization" (Ragin 1987). Skopcol's (2003) 'doubly engaged social science' provides a conceptual way out of this epistemological dilemma. For her, social science is "the pursuit of theoretically informed research that stays in close conversation with real-world problems" (in Steinberg and VanDeveer, 2012, p. 372; see also Ayres et al. 2003). This thesis embraces this understanding.

Emphasizing the importance of theory, while keeping a balance between context and specificity (Mollinga and Gondhalekar 2014), and between in-depth knowledge and comparability/replicability in the analysis of each case, I have developed a theory frame appropriate for analysing natural resource governance analysis. In Chapters four to seven, I will attempt to find such balance for each case and then synthesize differences and commonalities across the cases with regards to accessing and controlling water. Thus, the overall methodological approach in this thesis is a small-N qualitative, multiple case study (Creswell 2007). This research thus follows an interpretive logic. I describe the context of each case, before I attempt to analytically distil explanatory factors and patterns of water access and control from it.

3.2.1 CROSS-CASE PERSPECTIVE

Complementing the multiple case study approach, I adopted a cross-case perspective for this study. Stretton in 1969 argued that revealing new dimensions that would not have surfaced in a single case study, a cross-case perspective can prompt new questions, offer unique insights and generate new models. Furthermore, a cross-case perspective for the analysis of results “allows the researcher to compare cases from one or more settings, communities or groups” (Khan and VanWynsberghe 2008, p. n.d.). Building cross-connections between cases while still preserving the quintessence of the originality of each case’s knowledge can thus accumulate and produce new knowledge (Flyvberg 2001; Rueschmeyer 2003). It also opens up the possibility of including more than one or two factors in the explanation of the researched phenomenon. In the complex web of social interactions, such plural reasoning (Sen 2009) simply fits our daily social realities.

However, important to note is that my case studies show different levels of empirical depth and breadth. According to Levi-Faur 2005 (cited in: Mollinga and Gondhalekar 2014) “(...) comparative analysis that rest on varying degrees of in-depth analysis is a legitimate and scientific enterprise.” In that sense, the study area of the Hex Valley presents the primary case and the case of the Groot-Marico catchment the secondary case. The former is analysed in great depth, while the latter does not show the same degree of ‘depth’ and ‘breadth’, but contributes more strongly to the overall ‘Erkenntnisinteresse’ of how WUAs work and how local water users use this institution to access and control water. As such, in both cases I investigate the livelihood context of the three water user groups and analysed how they use their resources and capabilities to pursue this livelihood. I found that people use the same resources and capabilities as sources of power to access and control water, as it is part of their everyday livelihood. This analysis was done in a compacted fashion for Case II and not as detailed as for Case I.

In line with this, the empirical findings from Case II (Groot-Marico catchment) concerning the failure of the WUA establishment process support my argument that power issues of water access and control lie at the heart of this failure.

3.3 DATA COLLECTION - SELECTION OF CASES AND RESEARCH PARTICIPANTS

The main criterion for the selection of the two cases was the existence or non-existence of a WUA and CMA. Only two major catchments in South Africa were governed by the institutional triad of the Department of Water and Sanitation on national level, a CMA on regional level and WUAs on local level by the time this research commenced. One of them was the Breede and Berg catchment and within it, the sub-catchment of the Hex River Valley. The other one was the Inkomati-Usuthu Water Management Area (WMA). The Inkomati CMA was the first one to be established in the country and had already received considerable scholarly research attention investigating the workings of this ‘new’ institutional setup (Meissner et al. 2013). I thus turned my academic attention to a ‘less-researched’ area, the former Breede-Overberg CMA, recently re-named as Breede-Gouritz CMA after the National Water Policy Review 2013. Here, within a sub-catchment of the Breede River, the Hex River Valley, a fully implemented institutional structure according to the new legislation had been established (NWA 1998; NWRS 2), whereas in the Groot Marico area, water distribution for productive purposes was governed by the ‘old’ institutional setup of regional and local DWS offices

govern water access and distribution. This divergent context of 'before and after' institutional implementation, made a multiple case study and a cross-case perspective highly suitable in the sense of evaluative policy research.

Furthermore, during a research symposium at Monash University South Africa in early 2014, a colleague from a South African research consultancy presented the Hex Valley Water User Association in the Western Cape as an 'institution which works well and is functioning'. With this in mind, I decided to explore whether this perception could be verified by empirical evidence and to investigate the Hex River Valley WUA in a case study approach. Furthermore, by mid-2014, I also learned that the WUA establishment process in the Groot Marico catchment had failed and I decided to explore the reasons for this non-establishment. This allowed for drawing empirical lessons across cases for future WUA establishment in South Africa and elsewhere.

These two cases seemed predestined for exploring how each user group utilised their resources and capabilities' as sources of power to access and control water: in the first case, in the presence of the new institutions, and in the second case in their absence. Further questions were, why has the establishment failed in the Groot Marico catchment? Moreover, would I be able to identify the same factors of power, which had begun to emerge from the data gathered during first field visits to the Hex River Valley in 2014?

However, the practical choice of what to study (and where) is often determined by "data availability, feasibility of field work or the preferences and experiences of the researchers rather than clearly explicated selection frameworks" (Mollinga & Gondhalekar 2014, p. 185). Although Mollinga and Gondhalekar meant this as a critical comment, in academic realities, this is often simply true (pers.obs.), but rarely admitted. The fact that I had undertaken a previous research project in the Northwest Province has surely influenced my decision to *re-search* there again. During this previous academic research project in 2011, I was able to build a relationship of trust with some of the members of the rural communities around Koffiekraal in the Groot Marico catchment and also with some of the large-scale commercial farmers. This enabled me to enter the field building on these previous contacts.

For the selection of research participants for this study, I mostly used the techniques of purposive sampling and snowball sampling (Guest et al. 2006), while building on my professional network in South Africa and Germany. To recruit participants not easily accessible to me, snowball sampling was more appropriate than other sampling methods such as random sampling. Purposive sampling techniques (Given 2008) I used to focus on particular individuals of each water user group in terms of their livelihood opportunities and their ability to pursue a certain livelihood strategy.

Besides participants of the three water user groups²¹ in both cases, the range of interview participants reflected the research objectives and traversed different levels of water governance: for both cases, I chose participants from the national Department of Water and Sanitation (macro-level), the WUA on a regional scale (meso-level) and the local water users (micro-level). In line with the research objectives, the focus, however, I put on the micro level of everyday water governance. I enriched this by research interviews with actors from civil society with a professional affiliation to the South African water sector.

In the Hex River Valley, I initiated first contacts with the help of the regional CMA. Through conversations via email and phone, I was able to obtain the relevant contacts from the Hex Valley WUA and also learned about the emerging farmers and the three poor settlements. After the first interviews with the Hex Valley WUA CEO and with staff from the CMA, I also made contacts with the main commercial farmers in the Valley as they came frequently to the WUAs offices to discuss issues of water distribution and infrastructure. From there, snowball sampling took the research further. For interviews with the people living in the poor settlements I employed a translator who grew up in the Hex Valley and we simply walked into the settlements stopping at a small local tuck shop or entering a bar and started conversations with the local people. Soon after the first two days we were known in the area and snowball sampling enabled further interviews. I also simply walked through the settlement stopping when I saw someone watering their food gardens. My presence also attracted attention and sparked the curiosity of local people; this often initiated a chat over the fence leading into a longer interview.

On the ground in the Groot Marico catchment, I used my contacts from the previous research project to recruit participants and initiate the first interviews. For the village Koffiekraal, the tribal authority and the traditional leader of the community, who also operated on behalf of the broader Hurutse chieftains in the local villages of Brakuil, Uitkyk and Pella, were among the first contacts; from there it simply developed into a close relationship of exchanging knowledge and sharing experiences about water access in the area.

The commercial farmers I had met in 2011 were the first to be talked to again and from this point onwards more contacts 'surfaced'. For the interviews with government officials, I used information freely obtainable through public sources (websites of Departments, official documents etc.), but also my own private and professional academic networks.

²¹ A commercial farmer I have defined as employing 15 seasonal and 5 permanent workers or more on more than 30 hectares of irrigated land used for commercial agricultural purposes. In addition, all of the interviewed commercial farmers received water from the local irrigation scheme (besides other sources like groundwater and mountain runoff). All of the commercial farmers were white males of European descent, who started farming during the Apartheid. An emerging farmer in this thesis will also be referred to as developing, new entrant, black upcoming and resource poor farmer. All emerging farmers were black persons of traditional African descent and received (or were supposed to receive) water for productive purposes from the local irrigation scheme. Poor people living in the settlements refer to either the informal settlements in the Hex River Valley or the members to rural communities in around Koffiekraal in the Groot Marico catchment. The reason for choosing my own criteria is simple: no clear definition existed in South African legislation of what an emerging or commercial farmer is (see also Saruchera 2008).

Table 3: Research participants study area 1 - Hex River Valley

Interview Code	Research participants	Background
Interview A ²²	27	Fifteen interviews with men and women living in the four poor settlements of the Hex Valley: Orchards, Sandhills, Stofland and DeDoorns East. This included 22 seasonal farm workers; 1 domestic worker; 1 local shop owner, 1 local shebeen [small bar] owner; 1 child nursery provider; 1 schoolteacher in Stofland.
Interview EF 1- 5	5	Emerging farmers (EF) receiving water from the Hex Valley WUA.
Interview C-b	1	Small scale commercial farmer and member of Ceres WUA and former board member of the CMA involved in Hex Valley WUA establishment.
Interview C1,C2,C3,C4,C5	5	Commercial farmers (CF) (owning more than 30 h land) as members of Hex Valley WUA.
Interview D	3	Senior management staff of Hex Valley WUA (CEO, president, vice-president).
Interview E	1	CEO of Central Breede River WUA (neighbouring the Hex Valley WUA in terms of catchment)
Interview F	1	Senior manager of Breede Valley Municipality responsible for bulk water supply in entire Breede Valley.
Interview G	1	Ward officer for Stofland and DeDoorns East (elected representative from municipality).
Interview CMA 1-5	5	Senior management staff of Breede-Gouritz CMA. The CEO and the most senior water resource manager; one water control officer (senior manager); one senior and one junior manager from the CMA's section of institutional and stakeholder engagement.
Interview I	2	Senior managers from the national Department of Water Affairs and Sanitation (DWS). Deputy director (a1) and another senior manager (a2) from the section of 'Institutional Governance 'in Pretoria.
Interview J	7	Actors of civil society (1 senior researcher from the University of Cape Town; 1 researcher from Monash University South Africa; 2 consultants from consultancy 'informage' contracted by the Department of Water Affairs and Sanitation for the institutional implementation and capacity building for IWRM in the Hex Valley; 1 senior researcher from the Council for Scientific and Industrial Research (CSIR); 2 members of the ANC party Western Cape and communist party in Breede Valley).
TOTAL	54	

In study area 2 - the Groot Marico catchment - I conducted interviews with 59 participants.

²² Participants from this group were all practising small-scale subsistence agriculture in backyard food gardens or small fields of below 0.1 hectares. None of them was entitled to water from the three dams in the study area, but all aspired to get water from it.

Table 4: Research participants study area 2 - Groot Marico catchment

Interview Code	Research participants	Background
Interview A ²³	32	Fourteen interviews with people living in rural villages and settlements of Koffiekraal, Skunisdrift, Pella and Brakuil, as well as the rural town of Groot Marico. Fifteen of them practised small-scale food gardening.
Interview B1 and B2	4	Two emerging farmers (b1) entitled to water from the Marico Bosveld irrigation system. Two emerging farmers (b2) in Groot Marico abstracting water from Marico River illegally.
Interview C CF A - CF D	4	Commercial farmers owning in between 30 and 250 hectares; all potential members of the potential Marico Bosveld WUA receiving irrigation water from Marico Bosveld irrigation scheme.
Interview D	1	Water treatment plant officer of operations of local municipality (Groot Marico Municipality).
Interview E	1	Community leader of Skuinisdrift employed at local waste water treatment plant in Groot Marico.
Interview G	1	Head of Groot Marico information centre (local environmental activist in the area) and two other helpers of the centre.
Interview H	2	Tribal leader of traditional council of Koffiekraal and another council member.
Interview I	1	DWS regional water manager
Interview J	6	GMFP (Groot Marico Fresh Produce) Agricultural Development Project
Interview K	7	Actors of civil society (2 development workers living in the area linked to the German Ministry of Development running the MRDP; 1 senior researcher from the University of Cape Town; 1 senior researcher of Monash University; 2 consultants contracted by the Department of Water Affairs and Sanitation and the CMA for institutional implementation and capacity building for IWRM; 1 senior researcher from the Council for Scientific and Industrial Research (CSIR).
TOTAL	59	

²³ Fifteen participants from this group were all practising small-scale subsistence agriculture in backyard food gardens or small fields of below 0.1 hectares. None of them was entitled to water from the two dams in the study area, but all aspired to get water from it. In the contextual overview tables in Appendix 1-7, I have grouped the interviewees according to the place where the interview was conducted. I have not assigned codes for the latter, because sometimes people might have entered a focus group-based interview in a public space and left again, or the participants whom I had interviewed already joined again. As such, the data collection processes was shaped by the livelihood realities of the interviewees and was thus rather 'messy' (see also Ragin 2008).

3.4 DOCUMENTARY ANALYSIS

Following a case study approach, this thesis builds on a broad variety of data sources (Ragin 1997; Yin 2003). I gathered information through review of publications from the South African government including policy documents and guidelines, documents and other relevant legal acts, policies and government strategies. This is a valid technique to obtain information that is more formal and more structured as it comes from large organizations such as government institutions (Bailey 1994). The documentary analysis furthermore included the review of international and South African scientific publications, working papers, conference papers, conference proceedings, as well as masters and doctoral theses and scientific research reports.

According to Dane (1990) two types of secondary analysis exist, content analysis and data analysis. The former is related to the extraction of themes from a broad range of existing literature on a specific subject creating a set of data affiliated with the research focus. The latter concentrates on data that exists in an already processed form. In this thesis, I applied content analysis (du Plooy-Cilliers, Davis and Bezuidenhout 2014) mostly for Chapter one and two. Data analysis I used mostly for the analysis of the livelihood contexts of each case, as well as the TARPCO analysis of the water governance mechanisms. However, I interlaced empirical findings into sections of Chapters before the actual results Chapters wherever appropriate to improve readability. Such combination of collected qualitative data and other data sets is able to produce effective results in relation to the objectives of a study (Bechhofer and Paterson 2000).

In the literature review of Chapter 2 and 3, I used a broad range of international writings to obtain comprehensive information about South African water governance. Such secondary analysis is seen by de Vos (2002, p. 326) as “the reworking of already analyzed data”. It thus presents an empirical exercise on already collected data. Re-analysis of existing data-sets becomes increasingly important in the context of water governance as the literature is abundant, while new analytical concepts and reviewed approaches are lacking (Jonker 2007).

3.5 INTERVIEW DESIGN AND INTERVIEWS IN PRACTICE

I conceptualised the interviews as semi-structured and in-depth interviews (de Vos et al. 2011). Using questions and theory-based themes to guide the research interviews with participants, while ‘leaving enough room’ for deviating from that guideline if necessary, fitted well with the realistic, interpretive approach of this research. The themes were the derived from the Sustainable Livelihoods Framework, theoretical thinking around institutions and from social theory. Questions focused on the research participants’ perceptions about their livelihoods and their experiences in the processes of establishment and operation of the WUA concerning water access. To inform the collection of empirical data on the livelihoods of local water users I utilized theoretical thinking around the Sustainable Livelihoods Framework and underlying theoretical thinking of Amartya Sen (1984; 1999) on ‘rights and capabilities’. My interview guidelines also drew upon international literature on sustainable livelihoods (Chambers & Conway 1992; Scoones 1998; Shankland 2000). Nicol’s (2000) question checklist for livelihoods-based research in a governance context also proved useful in developing the interview guidelines.

Triangulation of methods (de Vos 2011) was applied to the processes of data collection. The data collected through in-depth interviews was enriched by personal observations in the field and observations and data collected during transect - walks and transect - drives in the study areas. This was done by myself and together with interview participants. Interacting with participants while they describe the environment they live in, deepened my understanding of the local people's lives and livelihoods and the factors that influence them providing a 'hands-on' epistemological approach (Chambers 1997). As Berry (1994) suggests, people, ultimately, are the principal informants and their statements and actions provide researchers with evidence about their social practices. As such, focus group interviews were chosen to gain a multitude of perspectives (Morgan 1997). Participants interacted not only with myself as the researcher, but discussed certain aspects among themselves enriching the data collection by a larger process of communication.

Thus, I have walked with participants along a specific river in the study area, while listening to their stories and learning from them. We walked across their fields (if indeed big enough to walk across), walked through their village, over their farm or simply sat down with them at a fireplace outside their house or shack, or whatever place they called home. I have talked to key informants and recorded empirical data while driving them to a place they wanted to go; met them in cafes and restaurants; at their offices; in a local shebeen (bar); or I simply sat down with people in the shade of a tree. In South African culture, this was a common ritual for communicating with each other and sharing knowledge. This interactive research approach extended the network of interview participants, enabled snowball sampling and I was able to build a certain amount of trust between myself and key members from the three interview groups.

3.6 DATA SATURATION: HOW MUCH DATA IS ENOUGH?

This concept of 'saturation' tries to pin down a certain point in qualitative research at which sufficient depth of empirical data is reached. However, sufficient answers based on scientific arguments on what characterizes this point are rare (Guest et al. 2006). Nevertheless, in this section I do not attempt to provide such arguments, but rather outline which criteria and categories I have used to determine the ominous point of 'saturation' (Fossey et al. 2006). A more practical way of (subjectively) determining sufficient size of 'samples', i.e. the 'thickness' of the data, is when, in the analysis stage of a qualitative inquiry, no new themes emerge and patterns of answers to the same questions become repetitive (see Jick 2006). These patterns relate to the research objectives and research question. This however, holds the prerequisite that data collection, analysis, coding, categorization and thus interpretation happen simultaneously. In this fashion, Patton (2002, p. 436) poses the question: "when does qualitative analysis actually begin?" He points out that in quantitative research the lines between data collection and analysis are clear, whereas in qualitative research they are fluid, dynamic and emergent in nature, which makes a distinction between data collection and analysis "far less absolute" (deVos et al. 2012).

In my practical research with people living in the settlements, I have asked at least two of the following questions: "Please describe for me, how you make a living?"; "What are the biggest challenges you face regarding water access?" and "If you could change three major things that influence the way you live here, what would they be?" After fifteen interviews with people from two

different settlements in the Hex Valley, I realized that the patterns in their answers became repetitive. How did I 'realize' that?

Questions had the purpose of understanding the ways in which people live and how they access water, the difficulties in pursuing a certain livelihood strategy and what they would like to change in that situation as well as their ability to change it. "There are no jobs here", "we take what we can", or "you try to survive with (xy amount of money)", as well as "I have no other option" were common examples of voiced concerns. I then mostly asked questions that encouraged my interview partners to specify a certain point, like: "Did I understand correctly that 95% of the people here work on the fields of the white farmers? - please explain what other jobs people take up". I thus deepened the understanding of a certain context (here, socioeconomic context of their livelihoods in the Hex Valley).

However, during later interviews²⁴ with people from all four settlements no new major hunches emerged and no completely new themes sprang to mind. The process I engaged in entailed the following: I recorded the interviews, but I also took notes comparing the themes and patterns of answers from my first visit to those of my second and third visit to the study area. However, I also recorded my daily research experiences with a voice recorder, reflecting on my observations and field notes, while listening to the recordings of the interviews.

In the later stage of transcribing and coding of data I used colour coding of my transcripts to find out whether the themes that emerged during the active research period, would 'jump at me' in this reflective exercise as well (de Vos et al. 2011). I furthermore cognitively engaged with the data while eating, while driving and while going for a run (see Esterberg 2002). I also wrote reflective memos and analytic memos (Kruger & Neumann 2006; Flick 2006) while being in the field and also in the later stage of transcription; this served the purpose of forging a link between the data and my abstract thinking in theoretical categories (see deVos et al. 2011).

There was also a practical dimension to the question of data saturation. After a number of interviews, my translator (who grew up in the Hex River Valley) said to me: "Man, from now it does not matter anymore where we go and who we ask; you will always hear the same story" (Hermanus 2015).

²⁴ This was not a linear process, but I used every opportunity to do an interview with one of the three user groups. As such, this was a 'messy process' (Creswell 2007) of adapting to practicability and feasibility of interviews, rather than following a rigid and structured schedule (see deVos et al. 2011).

3.7 CHALLENGES AND LIMITATIONS

Given my European background and the relatively limited time I spent in the field (four months for each case), my understanding of the South African context and especially the local context in the study areas cannot be expected to be comprehensive. Especially the understanding of the psychological, social and cultural impacts of the country's racist history and its impact on today's water governance remains heuristic. Overall, throughout the entire research process I tried to pay close attention to contextual realities in which institutional processes were embedded in, if not made of.

The language barrier made it sometimes difficult to interpret the gathered data, although the translators provided valuable help. Some meanings might have been lost and some stories might not have been accurately translated. Addressing this challenge both translators who I worked with grew up in the respective case study area and were fluent in the English and Afrikaans language (Case 1) and the English and Setswana language (Case 2). For translations in the Hex River Valley, a local community leader from a neighbouring area of Bonnievale provided support. Mr. Wilson Hermanus was aspiring to be a small-scale emerging farmer, had founded a local agricultural association for knowledge exchange in his village and had grown up in the Hex Valley working on the farms of the commercial farmers. He was thus familiar with the local context and the local history, which was one of the main criteria for choosing him as a translator.

In the Groot Marico area, I worked with a political scientist and PhD candidate of Geography and Environmental Sciences at Northwest University. The remote rural setup of the Koffiekraal community (and the other communities nearby) made it necessary to make use of a person familiar with local history and social dynamics. Mr. Sysman Motloung grew up in the Northwest Province not far away from Koffiekraal, spoke Setswana and English fluently and was familiar with the cultural history of the area writing his own PhD thesis about water cultures. This provided highly useful in the course of the interviews. However, on some occasions the tribal leader of the traditional village of Koffiekraal also translated the words of his village members for me.

Besides helping to mitigate the language barrier, the translators familiar with the local context helped to overcome the researcher's lack of knowledge about the racist history of South Africa and what this meant for today's livelihood of people interviewed for this study.

Another research challenge was access to officials from the Department of Water and Sanitation. Answerability of officials was largely limited. I had scheduled numerous appointments with officials, but often waited to no avail. This was the same for both study areas. Persistence and a certain amount of stubbornness provided helpful in some cases, while in others it was not constructive at all. My attempt to address this challenge by reactivating my professional and personal networks from my previous research project in South Africa, provided useful. Through them, I was able to obtain further contacts and snowball sampling took the research process further.

Another strategy provided useful. While in the field, I drove directly to DWS offices and presented myself to the secretary as researcher from Germany, who was interested to learn more about water governance in South Africa. This often proved to be more effective than scheduling official

appointments. Furthermore, inviting for a coffee, lunch or even an afternoon drink to get the participants out of their normal work environment proved helpful. I also found that initiating contacts through former members of the government-near Water Research Commission or simply dropping the names of high-ranking officials in an opening conversation with secretaries proved helpful.

However, collecting data from the meso-level of institutions for Case 2, proved to be a challenge, a lack of data I see as an unwanted limitation. For both study areas, I tried to overcome this difficulty by turning to actors from civil society first and to use their networks to find a way to interview DWS officials, as they had oftentimes built more reliable contacts to DWS staff members. In addition, the relatively extensive interviews I have undertaken with staff of the regional Breede-Gouritz CMA, as an official part of the DWS, served as adaptation to a lack of willing interview partners from the national Department of Water and Sanitation.

Another limitation was the loss of a considerable amount of photographs from both study areas. In an unfortunate incident during a transect walk, two data storage devices (USB-stick and memory card) were damaged by water and mud. The files were not accessible any more, although I tried to recover them with the help of the IT-specialists from Monash South Africa. The amount of visual documentation is thus limited in this thesis.

Safety was a constant concern in South Africa. As I travelled through the whole country from the southern area of the Western Cape to the northernmost part of Groot Marico bordering Botswana just by myself, I made no compromises in terms of security. Even if an accommodation was slightly more expensive, I opted for the secure location with guarded parking as well. My car was the most valuable material item I possessed, because my whole research strategy was practically built on the availability and functioning of this car. However, I was also threatened with violence by commercial farmers in both study areas, but especially in the Groot Marico area after three field visits it was made very explicit that I was not welcome anymore. If I would return, I was told by commercial farmer CF A, that I would need all the luck I could get, because I would need it, if they saw me again. He also knew that I had phoned the local police to inquire about illegal farm evictions and unlawful water abstractions, although I had told no one about it. As I had learned from the rural people that their third biggest livelihood concern was 'people disappearing', I returned to the area only once after this incident to finish the data collection with people from the rural villages in study area 2.

Nevertheless, I was able to collect solid and unique data in both cases. How I interpreted it, I explain in the following.

3.8 DATA ANALYSIS AND INTERPRETATION - TRANSCRIPTION, CODING AND THEMES

In line with David Hume (1738), I hold the view that knowledge starts with our senses. Quine (1961) puts it similar by saying that “knowledge we derive from our five senses is mediated by the concepts we use to analyse it” (cited in Marsh and Furlong 2002, p. 23). Referring to research designs, our theoretical and normative reference frames shape the questions we ask (see Rueschemeyer 2009). Rephrasing the famous words of Robert Cox (1996), Burnham et al. (2008) (p. 331) pointed out “theory and method are always for someone, for some purpose”.

The transcription of the recorded interviews was an important step of the analysis and interpretation of the data. Flick (2006) suggests transcribing only those passages of an interview that the researcher deems relevant to the research problem and research questions. This approach was rejected for this thesis for three main reasons. First, the essence of case-based approaches is to find a balance between the importance of context and the specificity of the phenomenon under investigation (Ayres et al. 2003; Rihoux 2006). In effect, context and phenomenon are hard to separate (if at all), because a causal factor influencing the phenomenon might only exist, because of the existence of a specific context. Second, the importance of a certain passage in a participant’s answer might not be immediately grasped, but only starts to make sense within the context of another participant’s answer. In some instances, this has provided empirical insights used to clarify another aspect, not fully understood by that time. Such connections between participant answers, or my interpretation of them, often surfaced an underlying cause or, in conjunction with another response of a participant, constituted a web of causal factors helpful to answering the research question. Third, transcribing only those passages perceived by the researcher as relevant, limits the possibility²⁵ of ‘grasping the bigger picture’.

Another reason for selecting word-by-word transcription relates to the abovementioned. “Plural grounding” (Sen 2009, p. 2) and pluralistic reasoning (Kooiman 2003), considering multiple causes at work all contributing to a specific outcome (or more than one outcome), is only possible on a (relatively) comprehensive basis of data (see also Rihoux and Ragin 2009). This enables the researcher to consider different grounds for explaining a certain outcome of social action, rather than agreeing on one “particular ground as being the dominant reason” (Sen 2009, p. 2). Sen furthermore contends that an “arbitrary reduction of multiple and potentially conflicting principles to one solitary survivor, guillotining all the other criteria, is not, in fact, a prerequisite for getting useful and robust conclusions (...)” (ibid. p. 4).

The process of data analysis was divided into different, although overlapping, phases. The first phase of data analysis started during the data collection process, it commenced the moment I stepped into the field. As Kruger and Neumann (2006) argue, while data is gathered, it is analysed. Writing or recording my analytic reflections after a day full of interviews, doing transect-walks and drives, taking pictures of the research area, and conducting interviews, presented a further active analytic engagement with the research context.

²⁵ This admittedly depends on the type of research, research design and chosen methods.

Patton (2002) emphasizes the researcher's important obligation to observe and reflect on their own analytical processes used in their work. Thus, the second phase of data analysis was coined by using the visual technique of colour coding and the writing of 'analytic memos' (Kruger and Neumann 2006). Firstly, I used the different highlighting functions of Microsoft office programs of Word and Excel in order to bring out certain words or a particular statement of an interview partner. These techniques of highlighting a word, phrase or whole sentence of transcribed data is also referred to as line-by-line coding or open/substantive coding (du Plooy-Cilliers, Davis and Bezuidenhout 2014). Secondly, I used what Kruger and Neumann (2006) refer to as analytic memos to explore the database after the first round of colour coding. These memos entailed short phrases, ideas or concepts that 'jumped at me' (see Patton 2002), while analytically reflecting on the colour codes. In addition to that, drawing on Strauss and Corbin, I used three different types of notes for these memos: code notes, theoretical notes and operational notes. However, while immersing in the data, the actual coding exercises and the writing of memos overlapped and it was not a clearly outlined step-by-step process (see also Flick 2006), but rather represented a hermeneutic spiral of data analysis (Ayres 2003), in which the analyst goes back and forth between elements of the text. This is also put forward by Denzin and Lincoln (2000, p. xv): "There is no one way to do interpretive, qualitative inquiry. We are all interpretive bricoleurs stuck in the present working against the past as we move into a politically charged and challenging future."

Nevertheless, code notes presented the next step in my systematic data analysis. They were used to immediately write down the results of brain storming on one aspect and to connect another aspect to the identified codes. Code notes were also used within the process of axial coding (Strauss and Corbin 1990). Axial coding followed open coding and led me to the discovery of relationships across the categories and codes. For example, the categories used to collect the data on livelihoods mirror the 'capitals' of the SLF. During the analysis, I discovered an interrelation of these capitals in the practical contexts of the study area; having the physical assets of transport, meant that people from rural communities were able to visit authorities and get information on water availability and usage patterns in their area. Such information coupled with the resource of knowledge about institutional governance of water (or knowledge about the existence and purpose of WUAs or the general water availability in the catchment) were resources of power in processes of controlling water for those endowed with these resources and capabilities over those who lacked them.

However, this process of axial coding was seconded by selective coding (ibid.), during which I applied the core categories (agency, structure and context) to channel the data coding was based into theoretical categories using Microsoft Excel. Theoretical nodes were a central part of a theoretical coding exercise (du Plooy-Cilliers, Davis and Bezuidenhout 2014), relating the answers grounded in practice, to the questions drawn from theory. They were systematic attempts to critically reflect on what was observed, what I thought during the observation and the deeper meaning of that in terms of my theoretical lens (see also della Porta and Keating (2008). For concretizing the category of agency, I have employed the capitals of the Sustainable Livelihoods Framework (SLF). They also proved useful as a proxy for power, as the capitals of the SLF also resemble themes of power well known in scientific literature. I have also used the SLF in conjunction with the TARPCO framework to inform the institutional analysis of the WUA. To further operationalise the category of context, I have used themes, which international academic literature on South African water governance had

identified as influential for how it unfolds on the ground. The socioeconomic context and, related to this, South Africa's racist historical context of black exploitation and marginalisation by a white elite.

However, the coding exercises mentioned above reduce the data as they categorises it into themes (de Vos, Strydom, Fouche and Delpont 2011). As Ayres et al. (2003) point out in their paper on cross-case analysis that a mere list of codes and categories does not present an analysis; it is however a central ingredient of an analysis that links theory to context. To preserve the contextuality of each case, I have used narrative analysis (Polkinghorne 1995; Bachmann 2007). Narratives are described as a "linguistic form uniquely suited for displaying human existence as situated action" (Polkinghorne 1995, p. 1). People frequently understand their every-day life in the form of stories. As such, everybody is 'casing' and narrating all the time. When speaking to others, people in their everyday life often use a form of case or narrative to recapitulate experiences within a certain context (see also Reissman 2008). Such narratives can describe the fullness of human experiences and perceptions as they present "a kind of knowledge that uniquely describes human experience in which actions and happenings contribute positively and negatively to attaining goals" (ibid, p. 8). For this thesis, I define *narratives* as analytical descriptions of the empirical context linking categories distilled from theory back to the context. As such, narratives as a form of data analysis fit well into the overall methodological approach of this thesis' case-based approach. I used narrative analysis collecting descriptions, events and participants' perceptions of their everyday live-routines (Bourdieu 1977) regarding water access for productive purposes through the WUA, as well as the involved processes (for example the voting procedures during a WUA Board meeting). For examples of those narratives please see the Appendix.

3.9 WITHIN-CASE ANALYSIS

I analysed each case following the same course: first, the research context was analysed in a descriptive manner; the focus here did not explicitly lie on explanation, but rather on understanding (see Yin 2014), although I offer empirical insights that I also use in the later power analysis. The purpose of this first step was to provide a thick, empirically rich contextual description of the case as a basis for exploring similar or different patterns of water access through a formal institution of water governance.

Data collected on the livelihoods of participants was categorised while being in the field using the Sustainable Livelihoods Framework. However, in order to explore possible interrelations in between the capitals, situational maps were used to rank the factors that influence an interviewee's livelihood. Using participatory methods of mapping, I asked participants to point out the most important factors in their livelihood and we would write it down on a piece of paper. The more participants mentioned the same factor, the participants themselves (or in some instances the researcher) encircled the word, thus creating a kind of word-cloud or relational map of factors influencing their livelihood (Clarke 2008; Mathar 2008). We then explored the question of which kind of resources and capabilities enabled or hindered the participant, or a person in general, to access and control structures and process of water governance. The latter thus presented a step to explore the power of a person to do something, as laid out in Chapter 3. Drawing on power theories (Barbalet 1987; Morris 2006; 2009; Saar 2010) and the theory of access (Ribot and Peluso 2003), the

resources and capabilities that participants drew upon to pursue a certain livelihood, I operationalized as manifestations of power to access and control water in both cases.

The relational maps were then enriched by other information given to me by the participants and accumulated into contextual overview tables of livelihoods of the three water user groups. Please see Appendix 1-7 for the tables.

3.10 COMPARABILITY AND ROBUSTNESS

An established view among those social scientists ontologically favouring an objectivist, positivist research approach is that it should be based on variables and, should ultimately, seek to provide generalizable knowledge or even predict future events (King, Keohane and Verba 1994). Validity would stem from large-N, mainly statistical, studies following the logic of 'the more N, the more significant inferences can be made and the more subsequent generalisations are valid' (see Smelser 2003). I disagree with such notions. For understanding why a certain social phenomena occurs in our dynamic, highly divers and mostly heterogeneous, multi-level and multi-actor, in other words complex, social realities (Rueschemeyer 2009), an experimental or statistical research approach alone cannot offer meaningful empirical understandings of social actions, their underlying causes or their outcomes (della Porta and Keating 2008).

Such positivistic notions of generalizability have long been relieved by new concepts for impacts of case study research beyond the specific of the case itself (Smaling, 2003; Glense 2006; Yin 2014). Goetz and Lecompte (1984) have pointed out that findings from a case-based study might not be generalizable in a probabilistic sense as they would stem from large-N (statistical) analysis, but that findings from one case study might have, or better, are very likely to be relevant to other contexts with a similar research problem (Creswell 2007; Mangal and Mangal, 2013). Goetz and Lecompte suggested comparability as a more appropriate term regarding case-based approaches than the rather universalistic term 'generalisability'. Similarly, Khan and VanWynsberghe 2008 (p. 9) argue that: "Comparability is the degree to which the parts of a study are sufficiently well described and defined so that other researchers can use the results of the study as a basis for comparison". In a similar line of thinking Patton (2002, p. 245) points out that "the validity, meaningfulness, and insights generated from qualitative inquiry have more to do with the information richness of the cases selected and the observation/analytical capabilities of the researcher than with sample size". Following this, I will provide empirically rich and detailed descriptions of the cases and the livelihoods of local people to have an in-depth understanding of local dynamics as a basis for the analysis of power.

Following a research strategy clearly outlined from the beginning of the research process, this studies' research approach can be transferred to other settings and contexts - it is replicable and comparable.

3.11 SUMMARY

This research applied qualitative methods of data collection and analysis embracing a realistic, interpretative ontology. I chose the research approach of a multiple case study and the perspective of a cross-case analysis to empirically understand 'how' and 'why' questions of water access beyond the single-case. I argue epistemologically that the perspectives of the participants should to a large degree determine the way to generate knowledge about a certain social phenomenon in a certain context. Not surprisingly, I applied an interpretive logic. In semi-structured and in-depth interviews involving 113 research participants, I gathered empirical evidence on the livelihoods of local water users; the characteristics of the establishment and operation of a WUA and how the two relate to each other in the process of accessing water for productive purposes. I draw on the Sustainable Livelihoods Framework, social theory, critical institutional thinking and theoretical approaches to power to analyse the research findings. I then explain some of the findings in the light of these theoretical approaches in relation to the overall South African water governance approach.

CHAPTER 4 - THE RULES OF THE GAME

SOUTH AFRICAN WATER GOVERNANCE IN POLICY, LEGISLATION AND INSTITUTIONAL ARCHITECTURE

This Chapter outlines the rules of the game. Water policy, legislation and the institutional architecture for accessing and controlling water in South Africa are presented, while offering empirical insights into its historical rationale, current implementation network and related outcomes. This resembles well-known categories of environmental policy and governance analyses (Najam 2005). In the following Chapters, the rules outlined below will be contrasted with findings from the field.

Historically, the evolution of water policy and law in South Africa was inextricably linked to the country's history of colonial and white-minority rule. The arrival of the East India Trading Company and Jan Van Riebeeck in 1652 brought with it a formal system of private ownership of land and legal control over water resources - a concept unknown to the native inhabitants of the Khoi and the San. They were mainly hunters and gatherers living a nomadic life roaming the country with their cattle, while following the rain (Funke et al. 2007). Land and water were not regarded as resources owned, but rather as a common-pool resource and as an integral part of life (ibid.).

However, under Roman-Dutch law water from springs and non-navigable streams was considered the property of the landowner, whereas water from other sources belonged to everyone with access to it (Msibi and Dlamini 2011). When the Dutch rule ended in 1805, the British took over the Cape Colony and established English law, which strengthened private land ownership through a permanent tenure system and formalized the riparian principle. In addition, water in streams and rivers flowing over private property was now also owned by the land owner (Pienaar and Van der Schyff 2007). With the Irrigation and Conservation Act (Act 8 of 1912) two legal classifications of water were introduced: private water and public water. Private water comprised springs and water flowing over privately owned land. Public water was any other water body. The following Apartheid Water Act (Act 54 of 1956) did not alter this legal differentiation and continued to determine water governance in South Africa until the political changes of 1990s. The Water Act of 1956 also provided for private ownership of water adjacent to someone's property under the riparian principle. The Apartheid government also subsidised the construction of Irrigation Schemes for the agricultural sector in the country providing white agricultural businesses with a considerable advantage of accessing water (Wilson and Perret 2010). In terms of water for productive purposes, this meant that the white agricultural elites in the country used 95 % of the available water mainly for large-scale irrigation, while the black population was systematically excluded from such access. As such, the historical legacy of the Apartheid privileged white agricultural enterprises in terms of access to resources, including finance, water and land (Mehta & Ntshona 2004). Fulfilling the new political mandate following 1994 meant a fundamental shift in South African water governance from racial segregation and white supremacy to participation and collaboration. This has despite the good intentions of the government not been transferred into everyday realities.

4.1 CONSTITUTIONAL AND REGULATIVE RULES - WATER LEGISLATION, POLICY AND INSTITUTIONS

Policies, regulations and laws act as a set of rules underpinning the implementation process of IWRM-based water governance and institutional practices in South Africa. In the following, legislation, policy and related institutions relevant for South African water governance are discussed. The main aspects of this discussion I will take up again in the later TARPCO analysis, as well as in the analysis of structural power.

4.2 WATER SERVICES ACT 1997

The Water Services Act 1997 addresses the constitutional obligation in terms of water access, countrywide water standards and the institutional requirements for water service provision. It states, “everyone has a right of access to basic water supply and basic sanitation” (WSA 1997). The Water Services Act 1997 sets the responsibilities and obligations of Water Service Authorities (WSA’s) with local governments (DWA 2004). WSA’s have the obligation to prepare Water Service Development Plans (WSDP) as part of an Integrated Development Plan (IDP) that must be submitted to the Minister. It contains an assessment of the status quo about social, economic and environmental aspects of a certain area, while outlining a future strategy for development. Planning for irrigated agriculture, in principle, still is a responsibility of the central DWS (Herrfahrdt-Pähle 2010). Under the NWA, Water Boards are established primarily acting as bulk water suppliers. For example, the water boards²⁶ in South Africa such as Magalies Water, Rand Water, or Overberg Water own and operate water infrastructure in a certain area and work in cooperation with the regional municipalities and their local branches (Pegram et al. 2006). WSAs are authorised to contract Water Service Providers (WSPs), which can be public or private national or international entities (WSA 1997) (Förster 2011).

However, in most cases, the local municipality acts as WSP; in others, the local Water User Association fulfils that function through a contractual agreement with the municipality or another WSP. The municipalities in South Africa are mandated to provide water and sanitation to the local population. Thus, they play an important factor in the how people access water in South Africa and how much they have available for their livelihoods.

²⁶ Water Boards are bulk water suppliers; they might operate dams, other water infrastructure, and some wastewater treatment facilities. They buy water from the DWS, treat it and sell it to large industrial complexes, but also to municipalities.

4.3 MUNICIPAL STRUCTURES ACT 1998

Municipalities and other local government structures are defined and given powers and functions by this act. With the Municipal Demarcation Act, Act 27 of 1998, South Africa has six municipal entities in metropolitan areas, 47 district municipalities and 231 local municipalities placed under the district municipalities. Again, each local municipality divides into mostly three or four wards encompassing small towns, semi-urban areas, or one to four villages or rural towns. This structure implemented in the years following 1998 was therefore new to rural traditional communities, whereas the white population had lived under a similar system of municipal organisation during the Apartheid, and were generally familiar with it (Pegram et al. 2006).

However, the Municipal Structures Act provides for the establishment of ward committees. As part of the government structure, they were established with the intentions of engaging with civil society organisations and communities in matters that impact local livelihoods, such as water planning and development and water related decision-making (Municipal Structures Act, 1998 (Act 117 of 1998), Section 72-78). Every Ward is represented by a Ward councillor, who is elected in municipal elections (see also Förster 2011).

4.4 MUNICIPAL SYSTEMS ACT 1998

The Municipal Systems Act and the Municipal Structures Act provide the legal basis to developing local governments. They outline important principles for their establishment and define their roles and responsibilities. From a water governance perspective, it is important that the Municipal Systems Act explicitly legislates for community participation (Manzungu 2002). It states that “a fundamental aspect of the new local government system is the active engagement of communities in the affairs of municipalities of which they are an integral part, and in particular in planning, service delivery and performance management” (Municipal Systems Act, 32 of 2000 - Section 5(1)(a)(i)). This also resembles the Batho - Pele principles mentioned in the beginning and links with the TARPCO criteria of this thesis for institutional water governance.

How such active engagement should be fostered or undertaken in practice is however not specified in the Act, thus omitting to provide guidelines for specific and expedient action. However, in line with Municipal Structures Act 1998 the ward councillor as the democratically elected representative thus can play a potentially significant role in ensuring the interplay of the local governance institutions and the citizens governed in matters of water.

4.5 NATIONAL WATER ACT 1998

The National Water Act (Act 36 of 1998) is the central piece of legislation in terms of water governance in South Africa. It presents the overarching legal framework for development, utilisation and control of South Africa's water resources. It builds on three ideas: sustainability, equity and efficiency. Figure 2 displays these principles while underlining the for this thesis most important aspects. These principles also reflect the influence of the internationally prominent policy discourse of IWRM on the 'design' of new legislation and policy, introducing new water use rights categories, as well as the more decentralised approach to institutional water governance (Movik and de Jong 2011).

The preamble of the NWA emphasizes a decentralised and collaborative institutional approach to water governance: "Recognising the need for the integrated management of all aspects of water resources and, where appropriate, the delegation of management functions to a regional or catchment level so as to enable everyone to participate."

Principles of the National Water Act

Sustainability, equity and efficiency are the principles that guide the protection, use, development, conservation, management and control of water resources.

- **Sustainability** means promoting social and economic development and at the same time ensuring that the environment is protected both now and for the future. The environment needs to be protected because it is where water comes from. If there is a good balance between using and protecting water resources then current and future water needs can be met.
- **Equity** means that everyone must have access to water and to the benefits of using water. Decisions to allocate water must be equitable (fair) to all people.
- **Efficiency** means that water should not be wasted. Water must be used to the best possible social and economic advantage.

Sustainability, equity and efficiency recognise:

- the basic human needs of present and future generations
- the need to redress (correct) past discrimination
- the need to protect water resources
- the need to share water resources with other countries
- the need to promote social and economic development through the use of water
- the need to establish representative water management institutions and
- the need to ensure participation of stakeholders and users in decisions that affect them.

Figure 2: Principles of the NWA (WWF n.a.)

Nevertheless, in terms of roles and responsibilities the NWA vests the responsibilities for water supply and sanitation with the newly established regional governments. It mandates local municipalities with the practical implementation of the responsibilities to supply water and sanitation services, while the countrywide water management, including the use and protection of water resources, continues to be a domain of the national government, represented mainly by the Department of Water Affairs and Sanitation (DWS).

DWS may delegate water management responsibilities on behalf of the Minister for Water Affairs to the CMAs (NWA 1998; Anderson 2005; Herrfahrtd-Pähle 2010) or to WUAs in the absence of CMAs. However, as local municipalities are mandated with the supply of water for human consumption and for sanitation purposes, WUAs mainly focus on water for productive purposes, which in South Africa, - apart from mining and economic activities close to urban centres of Johannesburg, Pretoria, Durban and Cape Town - mostly relates to large-scale irrigation. The political strategy for water governance is the National Water Resource Strategy 2 (NWRS 2), providing a kind of operational manual for CMA's and WUAs in each water management area in the country.

With the enactment of the NWA in 1998 South Africa was divided into 19 Water Management Areas (WMAs) corresponding with the major river basins in the country. Each WMA was supposed to be governed by a Catchment Management Agency (CMA). However, eighteen years after the first free elections in South Africa only two CMAs had been given operational status (Meissner et al. 2013).

In 2013, the National Water Policy Review took into account the enormous challenges the South African government was facing to establish the new institutions (mainly CMAs) and to give them operational status. Other challenges included, limited human resources and capabilities within the DWS to fulfil the political mandate of the NWA 1998, unclear roles and responsibilities and institutional fragmentation, as well as a lack of financial means to establish the new institutional architecture (Swatuk 2005; Monash University water scientist, 2011 Ruimsig; Interview Senior manager DWS 2015, Pretoria; Schreiner et al. 2011, 2013). However, recognizing these challenges, the proposed 19 WMAs thus were merged into nine WMAs to be governed by nine CMAs respectively. Figure 3 below depicts this. However, on a local level 98 WUAs had been established in the country mainly managing water resources for productive purposes for large-scale irrigated agriculture.



Figure 3: The nine Water Management Areas in South Africa (NWRS 2013)

However, the NWA normatively does away with white privileged access, “it promotes water use that is in the public interest and beneficial for the achievement of equitable and sustainable economic and social development” (WWF n.d.). Subsequently, the Act provides for the creation of a National Water Reserve for basic human needs and ecological purposes in order to address the constitutional obligation of providing an adequate amount of water for every citizen and deal with environmental degradation of aquatic ecosystems. The human reserve relates to the provision of so-called ‘free basic water’ of 25 litres per capita per day for human consumption within 200 m of walking distance and the general prioritisation of human consumption over any other uses.

4.6 NATIONAL WATER RESOURCE STRATEGY 2004/2013

The NWRS delineates the overriding policy guideline to establish the institutional and organisational structure for water governance in South Africa. Envisioned was a three-tiered structure: the Department of Water Affairs at the national level, CMA's at the regional level in each of the 9 Water Management Areas and Water User Associations at the local level (NWRS 2004). CMA's are managing bodies on basin level. As long as a CMA is not operational, DWS can act singly or through its regional offices (Anderson 2005; DWA 2004). Even after the establishment of a CMA, the DWS presents the last level of jurisdiction and national law prevails over provincial law (Pegram et al. 2006). However, the NWA provides that the overarching mechanism for water governance in the NWRS speak to the ideas of IWRM. This strategy sets out to include the public in decision-making over water and in everyday management in decentralised institutions. It furthermore lists the task to 'determine how much water is available in each Water Management Area' in order to determine the amount that could potentially be reallocated to the marginalized black population.

However, the backlog of the water sector reform, especially concerning the establishment of

new institutions well documented (Kemerink et al. 2011, 2013; Schreiner 2013; Meissner 2013). The growing evidence had in 2013 led to the development of the NWRS 2. Not surprisingly, the NWRS 2 lists 'institutional establishment' as a key priority area for government action.

Further key priority areas identified the following for fast-tracking government action in between 2013-2018:

- achieving equity, including Water Allocation Reform;
- institutional establishment and governance compliance and monitoring enforcement; and
- infrastructure development and operation and maintenance of water resources infrastructure.

Section 7 of the NWRS 2 mandates every water management institution to operate in accordance with the principles listed in the NWRS 2 (p. 69).

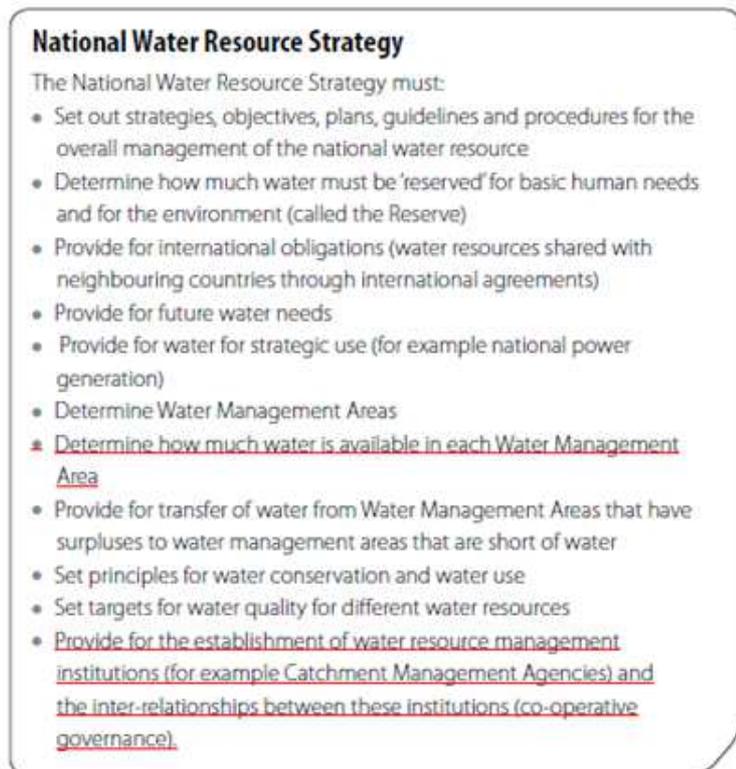


Figure 4: National Water Resources Strategy 2 (WWF, n.a.)

Concerning WUAs, the NWRS 2 (p. 61) constitutes the purpose of WUAs as to: “effectively manage local water resources for the common interest of their members, particularly for historically disadvantaged groups.” It furthermore (p. 67) specifies that WUAs: “must as institutions established under the NWA, give effect to the overarching principles and spirit of the NWA, which includes the principles of integrated water resource management, representivity and transformation”. However, the NWRS 2 as a regulatory policy guideline omits to define what representivity (the South African linguistic adaptation of representation) and transformation mean in the context of everyday water governance. It also does not specify how WUAs should implement it in practice for achieving the political goal of transforming water access for historically marginalised people and better their livelihoods. The Municipal Acts briefly reviewed above show the same ambiguity regarding the question of how to implement citizen engagement (Orne-Gliemann n.a; van der Zaag 2005; Schreiner 2009, 2013; Förster et al. 2017). This was also repeatedly expressed by staff personal of the interviewed Breede-Gouritz CMA, the three WUAs (Hex Valley WUA; Ceres WUA and Orange-Riet WUA) as leading to confusion about responsibilities and legal accountability. As such, the water policy has a strong normative political component, while omitting to have a practical one.

However, the intended improvement of access to water for productive purposes of the people previously excluded from such access, made a reform of the legal foundation for water allocation in South Africa necessary (see Orne-Gliemann n.d.).

4.7 WATER ALLOCATION REFORM

A Water Allocation Reform (WAR) program was launched in South Africa which was incorporated into the new water legislation in 2007. This raised high hopes of breaking white privileges by changing the legal basis for the ownership of land and water resources. Accordingly, a change from private user-user relations to a public trust doctrine of a state-user relationship with the DWS as the custodian of all water resources (Movik et al. 2011), was central to the normative ideas of turning water from a private commodity into a licensed, public resource.

Accordingly, the NWA provides for five different water use licenses as displayed in table 5 below.

Table 5: Scheduled water use entitlements (Adapted from NWA 1998)

Water Use Entitlement	Description	Further notes
Environmental and Human Reserve	Water required for ecosystem functioning and water required to meet basic human needs.	Environmental flow requirements are recognized to secure functioning of ecosystems. Free basic water is enshrined in the Constitution of South Africa with 25 l per capita per day within 200 m of walking distance.
Schedule 1	Smaller quantities of water for domestic use, watering of stock, and backyard gardens with potentially low impact on water resources.	For example, rainwater harvesting for which no license of or authorisation is required.
Schedule 2 - General authorisations	Larger quantities of water with potentially negative impacts on water resources. Authorisations can be given based on a specific type of water use and/or a specific category of water user.	The Water Allocation Reform specifically focuses on Schedule 2-4.
Schedule 3 - Licensed water use	Larger volumes of water or licensed water uses granted after 1998 under the new NWA.	
Schedule 4 - Existing Lawful Use	Water that was lawfully used (under the Water Act of 1956) in between the period of 1996-1998, i.e. two years before the NWA was enacted, is considered lawful until the DWS requests it to be transferred into a new license under Schedule 3.	

The main political idea behind the WAR program was to make water available for productive purposes of poor rural communities and resource poor farmers. This was to be achieved by either issuing new licenses or to re-allocate water entitlements curtailing existing allocations.

This however required upfront knowledge about the amount of water actually used by which user from which source under which license. By the end of the Apartheid, 98 per cent of the total available water resources in South Africa were lawfully allocated and further development options were already impeded (Movik and de Jong 2010). But as water was considered a private resource under the Apartheid regime, a reliable public database of water use in the country was not

available²⁷ also because appropriate measuring devices were rarely installed (Senior water resources manager Breede-Gouritz CMA, April 2014).²⁸ This is especially relevant, as the NWA 1998 had introduced a mechanism to re-allocate water from users of large quantities to smallholder farmers/gardeners in rural communities and poor settlements: compulsory licensing. The idea was to curtail water entitlements of large-scale users (mostly white commercial farmers) and give it to those historically deprived of it. However, this mechanism has, up until today, only been used three times in South Africa (DWS 2017).

This relates to a rather bizarre aspect of the NWA 1998. Despite the fact that the Act was often hailed as one of the most progressive water laws in the world (Anderson et al. 2008), it entails serious shortfalls regarding the preservation of white privileged water access. In stark contrast to the normative intention to right the wrongs of the past, the white agricultural elites were allowed to carry over their privileged water entitlements from the Apartheid period into the new democratic South Africa. This is called Existing Lawful Use (ELU). ELU is water used for productive economic purposes, in between the period of 1996 and 1998. These water abstractions are considered lawful today under Schedule 4 water use. In relation to irrigated agriculture, which considers 95% of South Africa's agricultural sector economic turnover, this basically means that all the 'private water' under the Water Act of 1956 that commercial irrigation farmers used in the two years prior to the enactment of the new legislation, has been converted into legally valid licenses under today's legislation. ELU was only to be converted into new licenses if specifically required by the DWS or a CMA (NWA 1998).

However, no significant progress was made in transforming Existing Lawful Use (ELU) into new licenses in the two study areas. In the Northwest Province 23 licenses were issued for water abstraction in the last seven years (Msibi and Dlamini 2011). In the Western Cape Province 199 water abstraction licenses were issued. None of them were issued to historically disadvantaged individuals, communities with tribal authority or other marginalised groups (ibid.). One reason was the complex process entailed, paired with limited financial and human capacities of the DWS (Schreiner 2013). Furthermore, financial compensations have to be paid to the original license holder (NWA 1998) in the case of curtailing existing allocations, which presented an obstacle to the South African government facing constant budgetary constraints. Backlogs and administrative delays in issuing new licenses are the normality (Mochotli 2010). The general water scarcity in South Africa with utilisable water resources being fully allocated impedes the issuing of new licenses as well (ibid.).

²⁷ This relates to a narrative I heard numerous times during conversations with professionals from the water sector: many official water records and documentation of commercial water users regarding water abstraction and use had been 'magically' lost during the transition phase from the white Apartheid government towards a democratic government in between the political turbulences of 1992 - 1994.

²⁸ For example, by the time the field research was conducted in the Hex Valley (mainly 2014) the outtake of the three major dams was metered. But the Hex River Valley WUA had only just begun to install water metres on the property boundary of commercial water users.

Additional reasons for the backlogs in issuing new licenses are: insufficient administrative guidelines and a lack of leadership from DWS, unwillingness of some water users to contribute to the redress and equity agenda, delayed inputs from other Departments, incomplete documentation from applicants and inadequate assistance to HDIs contributing to incomplete applications. This often created the need for follow-up administrative procedures further draining the already limited government capacities to carry out the job (Msibi and Dlamini 2011; Mochotli 2010; Interview senior researcher CSIR, June 2015). Also mentioned were a lack of direction from head office of DWS on institutional arrangements and a lack of clarity within the DWS Departments regarding the policy of transformation and what that means in practice (ibid.).

Movik and de Jong (2010) found that:

The concept of Existing Lawful Use was intended by the lawmakers as a means of easing the shift from the old to the new legislation. However, given the drawn-out nature of the reform process and the tendency to favour Existing Lawful Use as being more productive and efficient, such users have effectively become entrenched. The efforts that have been undertaken to cut back on Existing Lawful Use were often met with fierce challenges and the Department has frequently been taken to court where it has lost the majority of cases.

The rather complex procedure of determining the amount of water required for the ecological reserve to safeguard environmental flows and ecosystem health of water bodies has also been reported to cause delays in the process of issuing new licenses (Schreiner et al. 2009). One central reason for this is that without the knowledge of how much water is taken out of a resource by which user over a certain period in order to keep up the ecological functioning of a water body, issuing a new water use license could potentially jeopardise environmental base flows and ecosystem health. Such knowledge about water abstractions by users, especially large-scale commercial farming businesses, did not always exist (please see next section for further details). However, another reason is that in many cases commercial farmers or other large user of water have sued the government successfully. This has made many of the DWS staff members reluctant to act at all further delaying many administrative governance processes (Senior manager at DWS, formerly involved in the establishment process of the WUA in case study 2, March 2016, Pretoria).

The ambitious reform framework and in particular the Broad - Based Black Economic Empowerment (BBBEE) policy initiatives, aimed to develop the small-scale agricultural sector of black smallholder farmers, depended to large degree on the success of the water reform. However, by the time the policy reforms were introduced, the majority of black smallholder farmers were farmers on plots with a size of 0.5 - 2 hectares (Backeberg 2006). These smallholder irrigation schemes, predominantly carried out for subsistence purposes, generating cash and thus reducing food costs, for the last 50 years have had (and continue to do so) an important role in securing local food security“ (Backeberg 2006 p. 15). Their biggest contribution to the economy is making fresh, locally produced vegetables available to millions of people around in South Africa at a reasonable price and further enabling growers to supplement their family income (ibid.). Access to water, however, had always been the major constraint to such smallholder farmers and it continues to be, despite the water allocation reform was anticipated to achieve.

Accordingly, since the enactment of the NWA 1998 the Department of Water and Sanitation has issued new licenses under Schedule 1, 2 and 3, but not, as one would suspect to those that were denied access to water for productive purpose in the past, but to those that were previously privileged. From 1998 to 2011 more than 1 200 water-use licenses were issued in South Africa, but 98% of the cases the recipients were white commercial farmers (ibid.). This seems to be out of alignment with the goals of the water reform in South Africa.

4.8 VALIDATION AND VERIFICATION PROGRAM

The Validation and Verification (VandV) of Existing Lawful Use (ELU) was thought of as an administrative instrument to detect over-allocations of water for productive purposes and to re-allocate them to resource poor smallholder farmers.²⁹ The VandV program was thus a central element in the WAR program and crucial to make water available to poor communities and the poor living in settlements. As a precondition for smallholder agriculture, this could have also increased and basic food security and thereby contributed to enable the poor to take a step out of poverty (see Boelens 2008).

However, the VandV process is not only a highly technical procedure, but the DWS does not have sufficiently skilled personal and financial resources to conduct the VandV studies. The DWS, or the CMA respectively, contract consulting agencies to do the job of collecting data on water use from each user (Senior water manager Breede-Gouritz CMA, 2014 Worcester). For example, in the case area 1 of the Hex River Valley the CMA was tasked to undertake the VandV. Due a lack of human and financial capacities this process was conducted by a consulting agency (Aurecon) and faced a number of difficulties. The first relates to a lack of measurement devices for water abstractions. A former member of the Breede-Gouritz CMA management board (Small-scale commercial farmer in the Hex Valley, December 2014, Wolseley) commented on the efforts to validate the amount of water used by commercial farmers under a Schedule 4 license of Existing Lawful Use: “There is no legal measurement of flow. Some of the systems are so old, some are broken, some manipulated, some use is timely limited; so it is never verified and flow meters are not mandatory yet. Unlawful abstractions and altering the river flow is happening. It is minefield to try and sort that out.” In effect, the senior water resource manager of the Breede-Gouritz CMA confirmed, eighteen years after the end of Apartheid they had “no clue about how much water is there and who is using how much from which source” (Senior manager for institutional and stakeholder engagement at Breede-Gouritz CMA, April 2014, Worcester).

²⁹ The legal justification for curtailing existing use rights is labelled ‘beneficial use’ for the public in South African legislation. The mechanism for that is called compulsory licensing. Concerning this, section 25 of the Constitution, NWA section 32 and 33 are important. Van der Walt (2011) provides a sound analysis of the legal mechanisms and how the different pieces of legislation affect each other with regards to re-allocation, the question of expropriation and financial compensation. She reaches the conclusion that a curtailment of existing use entitlements in the public benefit of developing the nation does not mean an expropriation, but a publicly beneficial and lawful re-allocation.

Determining large scale water use during a period of time which lies 20 years in the past (ELU) and without the existence of any reliable hydrological data of water abstractions has been explained as “very difficult” (Senior water resource manager Breede-Gouritz CMA, CMA-2, September 2014). During this research, the process of VandV has been described by research participants (CMA-1; Consultancy, December 2014, Worcester) in the following way: an analysis of areal pictures (GIS-based images from the South African LANDSAT satellite) is undertaken to “determine the amount of green on a certain farm property.” The senior water resource manager at the Breede-Gouritz CMA explained (2015 Worcester): “We take the outline of a property for example; then you check on the image for what is the green area; you draw a line around the green area and then you actually ask the water user, what was planted there”. He continued to explain that in the next step the water requirements of the planted crop would be determined through the aerial pictures. The ‘amount of green’ in the pictures for the years of 1996-1998 were then taken as a basis to estimate the amount of water used to grow this crop. Asked whether they would take important geo-hydrological information such as evaporation rates, soil moisture, rainfall and underlying rock formations into account, the CMA water resource manager said no (ibid).

This process entails some serious shortfalls, besides being a costly enterprise (ibid.). To start with, this method delivers only an estimation of the amount water used, it does not present a reliable foundation for using the legal mechanism of compulsory licensing to curtail the entitlements of some users and re-allocate the excess water. Possibly following law suits of those whose licenses had been curtailed would potentially cause political turbulences (van der Walt 2011). In addition, the commercial farmers (Commercial farmer CF 4 and 3 in the Hex River Valley, 2015 DeDoorns) indicated that the VandV would be prone to manipulations. A commercial farmer told me that he had been sent a questionnaire by the consultancy Aurecon, in which he was supposed to fill in the amount of water used on his property for irrigation from each source. With respect to this process, another large commercial farmer in the Hex Valley explained (Commercial farmer CF 3 in the Hex River Valley, December 2015 DeDoorns): “It all depends on how honest you are. This is still a very large and very grey area. What do they want to do? They can sue me if they want. But I don’t think they can.” This clearly indicated that commercial farmers were not only aware of the lack of government capacity with regards to monitoring and control, but more importantly, of their limited capacity to enforce existing regulations. Rather they were counting on it, while bribes were often paid and lawsuits have mainly been won. These findings confirm Movik and De Jong’s (2010) finding that the water reform in practice was met with considerable resistance by the commercial farming community in South Africa. Barrientos et al. (2016) have recently published similar research findings about the Thukela River Basin in South Africa.

This process of trying to determine the amount of water used by the large agricultural producers also concentrates financial and human resources and capabilities within the DWS which cannot be used elsewhere. Schreiner et al. (2009, p. 9) noted that: “The WAR programme is currently held hostage by expensive, resource-intensive and highly technical procedures, particularly for the verification and validation of water use”.

However, to settle water disputes related to the potential reallocation of existing water quantities, the NWA provided an institutional mechanism.

4.9 WATER TRIBUNAL

The National Water Act 1998 provides for an administrative appeal process. The Water Tribunal was anticipated as an independent statutory body, which, by law, has jurisdiction over water disputes in South Africa. Any person feeling maltreated by a decision taken by water functionaries or a water institution or by a fellow water users can appeal to this body (NWA 1999, Chapter 15). Incorrect interpretation of water law and issues of administrative justice regarding water access, control, distribution and use by any of the legally established water governance institutions can be subject of appeal (Pegram et al. 2006). Appeals to the tribunal must be prosecuted as if it were an appeal from a Magistrate's Court to a High Court (NWA 1998, Chapter 15). In principle, the Minister of Water and Sanitation is subject to decisions of the tribunal, in the same way, at least in a legal sense, as a poor small scale farmer or a large commercial farmers or a water user in a remote rural village practising subsistence agriculture.

However, the Minister of Water and Sanitation has since 2011 refused to appoint a new Water Tribunal, but instead, had instated a panel of mediators to which the appeals of citizens had to be directed. This, however, was not in line with current legislation. The North Gauteng High Court³⁰ found in 2012 that the Minister herself had acted illegally, as she had neither any authorisation to disestablish a government body that was legally tasked to deal with water disputes, nor to replace it with another body not even mentioned in the existing water law of South Africa.

Despite the court's ruling in 2012 for the Water Tribunal to be re-established to ensure that appeals lodged by applicants can be heard (section 2), this had not happened up to the time of writing. Minutes of South African parliamentary committee meetings dealing with water and sanitation issues revealed that the absence of a dispute settlement process has been a controversial topic amongst Members of Parliament (PMG 2011) and has caused judicial and legal confusion for water users throughout the country.³¹ Rather than settling disputes regarding water, its absence became the reason for legal and parliamentary disputes.

³⁰Centre for Environmental Rights. 2016. Online: cer.org.za/wp-content/uploads/2012/12/Exxaro-v-Minister-of-WA-and-JSC-NGHC-Dec-2012.pdf (accessed: 04.11.2016).

³¹Southern African legal information institute. 2016. Online: <http://www.saflii.org/za/journals/PER/2017/4.html> (accessed: 22.06.2016).

4.10 MESO - LEVEL INSTITUTIONS OF SOUTH AFRICAN WATER GOVERNANCE

4.11 CATCHMENT MANAGEMENT AGENCIES (CMAS)

CMAs and WUAs are the core elements of a political attempt to decentralise water governance and to involve water users in decision-making and provide platforms for collaboration (NWA 1998). CMAs represent the proposed transition of the river basin principle (subsidiarity principle) into the institutional reality of South African water governance. They are statutory bodies under the NWA managing water resources at catchment level on behalf of the DWS.

In order to guarantee a certain level of democratic representation the governing boards of a CMA were anticipated to represent all relevant stakeholders affected by decisions over water management (DWA 2004; 2007). It was envisioned that board members are appointed by the minister after consultation with interest groups (Pegram et al. 2006). Furthermore, appointed representatives of the members of WUAs of the area of operation of the CMA were to sit on the Management Board of the CMA as well, not on a permanent basis, but when requested or the matter discussed demands special input and local knowledge (Herrfahrdt-Pähle 2009). Mandated with the task of coordinating water related activities in each of the 9 WMA's, CMAs were envisaged to be the main actor in water governance on regional level (Laube 2009). Functions of a CMA consistent with the NWA are: development of a Catchment Management Strategy (CMS) in accordance with the NWRS; coordination of water governance institutions - like water user associations; ensuring sustainable use of water resources; and promoting community participation and collaborative governance (DWA 2004b). An important tool for the latter is the formulation process of the CMS.

Guidelines for CMS development explicitly recognise the need for public involvement and provide a basis for structuring public engagement (DWA 2007). The DWS and the newly established CMAs supposedly engage the public to participate and provide the means for water users to participate in workshops for the CMS development. In the process of developing the CMS consultation refers to the involvement of water users in the process of developing the CMS with the aim of informing the public about water related strategy and planning (Made 2008). Providing capacity building workshops and conducting stakeholder meetings allowing for input seems to be the collaborative element.

However, local water users might contribute to the formulation of aspired goals of water governance in the CMS, but it is not a legally binding document directing the DWS, the CMA or a WUA how to act - it is a normative statement of political will listing principles for action and goals to be achieved. Nevertheless, it is an important document for water governance in South Africa as the NWA 1998 makes reference to the CMS as a document to be complied with in processes of everyday water governance. Part of the relevance for achieving the national goals of improved access to and control of water for productive purposes by previously excluded people, stems from a CMAs mandate: to include a water allocation plan for the catchment into the CMS, which specifies the "principles for allocating water to existing and perspective users" (NWA 1998, Ch. 2, Part 2).

Nevertheless, in order for an effective allocation plan to be developed by the CMA (if established), the completion of the VandV process would be required.³²

However, on a local level of WUAs the NWA makes no provisions for a local water management strategy. However, a model constitution for all WUAs in South Africa provided in the Appendix of the NWA 1998 was used as a blueprint to develop all WUAs in South Africa. This model constitution does not mention the need to comply with the CMS; in fact, it does not mention the CMS at all. This again demonstrates a lack of practical guidance for implementing water governance in the country.

4.12 CATCHMENT MANAGEMENT COMMITTEES

In line with the above, NWA provides for the formal establishment of committees by the CMA. They may be delegated powers or merely have advisory character (Pegram et al. 2006). A Catchment Management Committee (CMC) can be formed as a statutory body and comprises representation from the CMA governing board and other stakeholders. In principle, two types of CMC's exist: an area-based CMC was seen as a channel for communication and information sharing and a mechanism for collaboration among stakeholders and the CMA. An issue-based CMC was anticipated to consider a certain issue of water governance, such as water quality, allocations or agricultural water use (Karar et al. 2011). However, to date, no CMC has been established in South Africa (ibid.). CMC's can consult and cooperate with Catchment Management Forums in the process of decision-making regarding water and they were also seen as complementary to WUAs (ibid.).

4.13 CATCHMENT MANAGEMENT FORUMS

Catchment Management Forums (CMFs) are not a statutory body and are not specified in the NWA. Nonetheless, they are not merely voluntary associations of water users channelling their interests; they were anticipated to provide an important mechanism of stakeholder communication, participation and consultation with the DWS and as an interface for collaboration of WUAs, CMAs and local government (Made 2008). A CMA can also ask the CMF to perform certain functions, like conducting awareness raising activities in a sub-catchment collaborating with consultants for a certain collaborative activities like river clean ups or capacity building workshops (Karar 2008). A number of CMFs have been founded in South Africa and some have been active in their catchments (Senior manager Breede-Gouritz CMA, September 2014, Worcester). However, in the absence of CMAs potentially coordinating the work of forums and committees, their impact on everyday water governance is marginal (ibid.). However, the opposite is true for Water User Associations in South Africa, as 98 WUAs have been established in the country until 2015 representing approximately 500 000 hectares of irrigated agriculture in the country (CEO of SAAFWUA, December 2015, Johannesburg).

³² This information was either not existent in the Department of Water Affairs at the end of the Apartheid period or was lost in the transition phase from 1993 onwards. One research participant described it as "unbelievable" that "no reliable list was available on government side of how much water is there and how much is actually used" (Senior water manager Breede-Gouritz CMA, CMA-2, 2015 Worcester).

4.14 MICRO - LEVEL INSTITUTIONS: WATER USER ASSOCIATIONS

The NWA defines WUAs as “cooperative association of individual water users who wish to undertake water-related activities for their mutual benefit” (NWA 1998, Chapter 8, preamble). The main objective of WUAs is to coordinate and undertake water management activities on a local scale with the aim of transforming water access and providing water for economic activities of public benefit (NWA 1998, Section 8; NWRS 1 and 2).

The central importance of WUAs in the water governance architecture stems from the political mandate outlined above. At the heart of this developmental and supposedly transformative legislation stands the idea to transform a white farmer’s organisation from the Apartheid era - the Irrigation Boards (IBs) - into inclusive Water User Associations (see Jonker et al. 2010). Irrigation Boards were white farmers’ institutions on a the local level self-governing water access and distribution according to allocations tied to land ownership under the Water Act of 1956.

However, regarding the use of water for productive purposes three types of WUAs can be formed (NWA 1998, Section 61):

- a) WUAs resulting from the transformation of previous Irrigation Boards;
- b) WUAs as a result of registering small irrigation schemes (SIS) and
- c) WUAs in rural areas, consisting of people with the intent to start an agricultural project or for an existing project.

From the 279 Irrigation Boards that existed in the country by 1994, 92 were merged into 58 WUAs under mechanism a), sometimes amalgamating more than two IBs into a larger WUA (DWS 2017). Forty new WUAs were established through mechanism c), which mostly involve rural communities. The remaining IBs are, however, still governed by the 1956 water legislation.

Powers of a WUA are assigned and delegated by the minister to a Management Committee (MANCO), which is composed by the potential members through democratic processes of nomination and election. The MANCO is the central steering committee of the WUA and core decision-making body regarding water governance in a certain spatial area of responsibility.

A WUA in South Africa is the institutional vehicle for three core functions stated in the NWRS 2 (p. 66):

- Pooled resources and mutual benefits;
- Delegated powers and duties and implementing agent and
- IWRM/representivity and transformation.

Notably, neither the NWA 1998, the NWRS or the National Water Policy Review of 2013 defines what exactly is meant by those three core functions or what they meant for the everyday practice of water governance. In the NWRS 2, 85 terms related to water management are defined, but it does neither define any of the terms mentioned as core functions, nor does it specify the institutional steps need to be undertaken by which kind of level of governance in South Africa to achieve it.

Throughout the research interviews, participants from all governance institutions, IWRM consultancies and Universities pointed out that a lack of clarity of how for example transformation is defined and what it would mean for the implementation of the water policy and the operation of new water institutions would hinder the implementation of the water policy (Breede-Gouritz CMA, CMA-1 to CMA-3 April 2014 Worcester; Consultancy, December 2014, Worcester; Senior researcher in the water field from University of Cape Town, 2015 Cape Town). Similar statements came from governmental officials regarding a lack of clarity on roles and responsibilities and codes or guidelines for how to translate the normatively appealing words of the NWA 1998 and NWRS into practice.

However, the three principles listed above clearly portray the developmental goals of the post - Apartheid water legislation. Actors were anticipated to collaborate, pool their resources and generate benefits for everyone involved by creating win-win situations. To be representative of all water users regardless of a formal water entitlement and giving them decisive powers (Brown 2014), and thus, to transform decision-making over water for productive purposes are delineated. As such, collaboration - previously broadly defined in this thesis as 'as doing things together in an institution' - is central for the anticipated empowerment of the poor living in rural communities and informal or semi-formal settlements.

In the absence of functioning CMAs in South Africa with an unclear political future,³³ WUAs are indeed central to South African water governance.

4.15 LEGAL PROVISIONS FOR WUA IN THE NATIONAL WATER ACT 1998

In Chapter 8 of the NWA (section 91 to 98) deals with the powers of a WUA and elaborates on the legal procedures to be followed prior to their establishment:

- a) requirements for the proposal for the establishment of a WUA;
- b) procedures to be followed for WUA establishment;
- c) requirements for a constitution that guides the operation of a WUA;
- d) powers a WUA has to act;
- e) obligations of a WUA to comply with directives issued by the minister;
- f) requirements for disestablishing a WUA;
- g) procedures for the winding up of affairs of a disestablished WUA and
- h) provisions for existing institutions of water governance (Irrigation Boards).

³³ The Deputy Director for institutional governance at DWS (January 2014, Worcester) highlighted the fact the costs of establishing and operating 9 CMAs would also overburden the DWS. Thus, the heads of the Department had started discussing the idea of having only one "super-CMA" for the whole of South Africa. More details this key informant was not ready to disclose, but he confirmed having attended departmental meeting regarding an institutional architecture below the DWS of having one CMA responsible for 9 WMAs.

The proposal for a WUA can be made by any person and citizen of South Africa and has to be approved by the Minister of Water and Sanitation. In effect, it was the DWS staff of the Departments section of 'Institutional Governance' that approved a WUA proposal³⁴ and then included and then constitution "put it on the Minister's desk for signature" (Deputy Director for institutional governance at DWS, January 2014, Pretoria). The Minister then has the right to demand additional information on the area the WUA will be responsible for in terms of water governance or demand amendments of the proposed constitution, which has to be submitted together with the WUA proposal (NWA 1998, Chapter 8). Such amendments might regard the composition of the Management Committee, the criteria for being a member or the allocation of voting rights to the different members.

Nevertheless, in terms of monitoring and compliance, the NWA assigns the minister of water and sanitation an oversight role and he or her may also issue directives WUAs have to comply with. The Minister for example might instruct that a person be admitted onto the Management Committee of the WUA, or demand any other action to be performed like extending irrigation channels to connect smallholder farmers to an existing scheme. If the WUA "has acted unfairly or in a discriminatory or inequitable way towards any member of the association"; or if the WUA "has failed to admit persons to membership unfairly or on discriminatory grounds" (NWA 1998, Ch. 8, Section 95) the Minister can issue a directive the WUA has to comply with. Open to interpretation is what those terms mean in practice, or even more important, how can a person prove that he or she has been treated 'unfairly' or in a 'discriminatory manner'. The institution to which such unfair treatment needs to be notified and how the onus of proof is regulated is also not specified.

However, in section 91.1 of the NWA it is specified that a proposal to establish a water user association must contain at least the following:

- a) the reasons for making the proposal;
- b) a proposed name and area of operation for the association;
- c) the proposed activities of the association;
- d) a description of any existing or proposed waterworks within the proposed area of operation which is relevant to the proposed activities of the association;
- e) a description of the water use licences or any other authorisations which the proposed members hold or intend applying for;
- f) the proposed constitution of the association, together with an explanation for any provisions which differ from those of the model constitution contained in Schedule 5;
- g) a list of the proposed members or categories of members of the association; and
- h) an indication whether there has been consultation in developing the proposal and the results of the consultation.

³⁴ Such proposal must of course specify the area or operation, i.e. the catchment or sub-catchments (tertiary or quaternary catchments) it wants to manage in terms of water.

As such, the most important document for the operation of a WUAs in South Africa is the WUA Constitution. "It all depends on how the Constitution is formulated", said the consultant involved in the establishment of the WUA in the Hex River Valley, who was also contracted by the Department to undertake IWRM trainings in the Western Cape Province in 2005 and 2006.

According to the NWA, section 91.1 the constitution of a water user association also contains:

- a) details of the principal and ancillary functions of the association;
- b) the procedures and requirements for admitting new members to the association;
- c) the voting powers of members;
- d) procedures for terminating membership;
- e) procedures for electing the management committee of the association;
- f) procedural requirements for appointment of employees of the association;
- g) procedural requirements for obtaining loans; and
- h) financial obligations of members towards the association.

However, it is left open to interpretation of how to exactly formulate the voting procedures and allocate the voting rights to members in WUA constitutions. The regulations issued by the DWS for WUA establishment (please see section below) merely state that voting procedures need to be specified, but no criteria are given for ensuring the establishment of a MANCO representative of the demographic realities in the area of responsibility, as called for by the NWRS 2. Should the Minister approve the WUA proposal he or she has to issue a public gazette allowing for comments by 'the public' to be submitted to the Department within a timeframe of 60 days, make appropriate responses and then establish the WUA. Again, how exactly this should be done is not specified, because the NWA merely defines loose principles as codes of conduct. This means that the founding members of a WUA can establish the procedures and assign voting power to members as they see fit.

This makes the guidelines issued by the DWS of how to establish a WUA even more important.

4.16 REGULATORY RULES: WUA ESTABLISHMENT GUIDELINES

The DWS published 'WUA Establishment Guidelines' (DWAF 2007) entailing the principles to be followed in the process of WUA establishment. Notably, a control and enforcement mechanism, incentives for compliance or penalties for non-compliance attached to those regulatory rules are not specified by any water law or policy guideline in South Africa.

The TARPCO criteria I have derived from international academic literature resemble these general principles below. Regarding the policy implementation research component of this study, these are thus well-suited to analyse the establishment of WUAs in both study areas.

However, general principles for the WUA establishment list:

- information sharing;
- knowledge building;
- representation;
- cooperation;
- local participation and
- monitoring and control.

These principles were to be taken into account during the establishment meetings with stakeholders within a debate to "foster a spirit of joint and participative decision-making" especially in terms of water for agricultural purposes (DWAF 2007, p. 8). For achieving effective outcomes, facilitators must "explain the Act, its aims and their role and function as a WUA". Facilitators of such meetings furthermore "must ensure that all interest groups are represented and that one group does not dominate". Facilitators can be DWS officials or contracted private consultants. The NWA 1998 (Ch. 8, Section 91) also demands that the WUA establishment proposal contains "an indication whether there has been consultation in developing the proposal and the results of the consultation." Consultation here remains a relatively vague term, because it is not specified what this entails in practice. However, the Deputy Director for Institutional Water Governance at DWS (January 2014, Worcester) explained that such consultation would mean "to get the local guys involved and working together in water resources management." This definition fits this thesis definition of collaboration set out in the previous Chapter.

However, the guidelines (DWAF 2007, p. 7) further specify that "(...) deliberate and appropriate efforts need to be undertaken before WUAs can be established. Otherwise the potentially positive role of WUAs as instruments of empowerment and poverty alleviation could be overlooked." This again sets out the central role of WUAs in achieving the overall goal of social development through improved water access. Notably, the guidelines already foresee potential challenges of power asymmetries influencing the process of establishing a WUA. They caution against the domination of one sector over another and point out that representivity must be ensured especially in cases "(...) where a large, multi-sectoral WUA is to be established, or where there are fears that the WUA may be dominated by one sector" (DWAF 2007, p. 8).

The DWS' awareness of power asymmetries is even clearer in the guidelines when it states that, "Irrigation Boards have thrived on institutional and social arrangements that do not have a place in the current dispensation. Therefore, to transform them in a manner that redresses past imbalances (e.g. adequate community, gender and racial representation and equitable access to water) also requires effort" (DWAF 2007, p. 9).

Such effort comes into play through another legal mechanism with potential relevance for the operation of WUAs and also with respect to the monitoring and control of WUAs by the Department of Water and Sanitation: the Business Plan.

4.17 BUSINESS PLANS

The NWA 1998 (Ch. 17, Schedule 4, Section 79) stipulates for the preparation of a business plan by CMAs and WUAs six months after their establishment and the submission of a yearly updated version of the business plan to the DWS. On a yearly basis the NWA also requires WUAs to submit an annual report. Whereas the annual report is more general in character and relates mostly to the financial side of water management (Senior manager for institution and stakeholder engagement Breede-Gouritz CMA, April 2014, Worcester), the business plan represents an important mechanism of the DWS to monitor and control WUA operation. Matters to be included entail overall strategies and policies implemented and planned to achieve the targets set out by the business plan; it demands financial targets to be set and requires the listing of capacity building activities undertaken for MANCO members. However, the NWA also demands the business plans to have financial and performance indicators to control what has been achieved in terms of representation, participation and the improvement of water access for the black population. The Minister furthermore has the power to demand any kind of information determined by her or him to be included in the business plan. These features makes it an important tool for the monitoring and control of WUAs operation in South Africa. However, up until December 2016, none of the WUAs in the country had submitted a business plan and the DWS had not demanded them for the three WUAs interviewed in this research. This represents a considerable lack of transparency and accountability in the absence of the potentially most influential means of control and enforcement of the rules of the game.

4.18 SUMMARY

With the Water Service Act and the Municipal Structures Act and the National Water Act (NWA) a dual structure of water governance has been established in South Africa (Herrfahrdt-Pähle 2010). Local governments and municipalities are responsible for water supply and sanitation services, while the national DWA has regulating, planning and general control functions (Made 2008). Catchment Management Forums, Catchment Management Committees and the formulation process of a Catchment Management Strategy were thought of to be platforms for public involvement and stakeholder collaboration.

Water User Associations stand at the heart of local water governance in South Africa. This is due to two main reasons: a practical and a legal. Practically, only two CMAs are operational in the country 18 years after the enactment of the NWA 1998, but 98 WUAs have been established. As such, WUAs are in effect the core institution of decentralised water governance architecture in the country. This is even truer as the DWS has now merged the initially 19 Water Management Areas in South Africa resulting in nine WMAs governed proposed nine CMAs. This means that under the new institutional arrangements, CMAs are responsible for a much larger area; before merging, the Breede-Overberg CMA (Breede-Gouritz CMA) for example was responsible for an area of 20 000 square kilometres (Senior water resource manager CMA-1, Breede-Gouritz CMA, April 2014 Worcester). After the spatial reform of WMAs, the new Breede-Gouritz CMA is responsible for 60 000 square kilometres without having hired new staff by the time of writing this thesis. Research participants from the new Breede-Gouritz CMA told me that in terms of local water management they were completely relying on WUAs and that without them the CMA would not be able to function (Senior water resource manager CMA-3, Breede-Gouritz CMA, April 2014 Worcester). WUAs are the local pivot in everyday realities of governing water for productive purposes and have thus a big impact on millions of livelihoods in today's South Africa.

In the following Chapters, this impact is portrayed and analysed.

CHAPTER 5 - THE HEX RIVER VALLEY

How has the institutional setup outlined the previous Chapter been translated into everyday practices of accessing and controlling water? How has the normative vision of improving water access of the poor and marginalised to better their livelihoods found its way into South African realities on the ground? Finally, how have local actors played the game of water access and control using their resources and capabilities as sources of power?

The previous Chapter outlined the structures of South African water governance as the rules of the game. In this Chapter, I contextualize the broader arena of the game and its actors in three steps. First, analysing relevant historical, social, economic and financial, as well as biophysical characteristics of the study area in relation to water access and control, I provide an analytic description of the general livelihood context in the Hex Valley. However, in everyday life the used livelihood categories of social, economic etc. are neither rigid nor clearly separable, but rather fluid and overlapping. As such, the findings are presented in pairs of two or three indicators.

However, due to the comprehensiveness of the livelihoods analysis conducted for this thesis, I present its in-depth results in contextual overview tables. I also make use of analytic narratives in Appendix three to seven to conserve the empirical richness of people's lives. Second, I present the analysis of the Hex Valley WUA according to the TARPCO criteria, which mirror principles of governance prescribed in South African legislation in general, and pertaining to WUAs in specific. In a third step, I discuss findings of how commercial farmers, emerging farmers and small-scale subsistence farmers were able to utilise their power to access and control processes within different formal layers of rules of WUA establishment and operation. This uses the theoretical categories of structural, agential and contextual power.

5.1 CONTEXTUALISING THE GAME AND ITS PLAYERS

The Hex River Valley is located within the Western Cape Province of South Africa. Situated within the broader Breede River catchment, the Hex Valley³⁵ lies in an enclosed area, geographically bounded by high mountain ranges on either side of the valley. The high rising Matroosberg Mountain ranges (1 900 - 2 200m) to the northeast and a gently sloping south-eastern mountain range encapsulate the valley centred around the small town of DeDoorns.

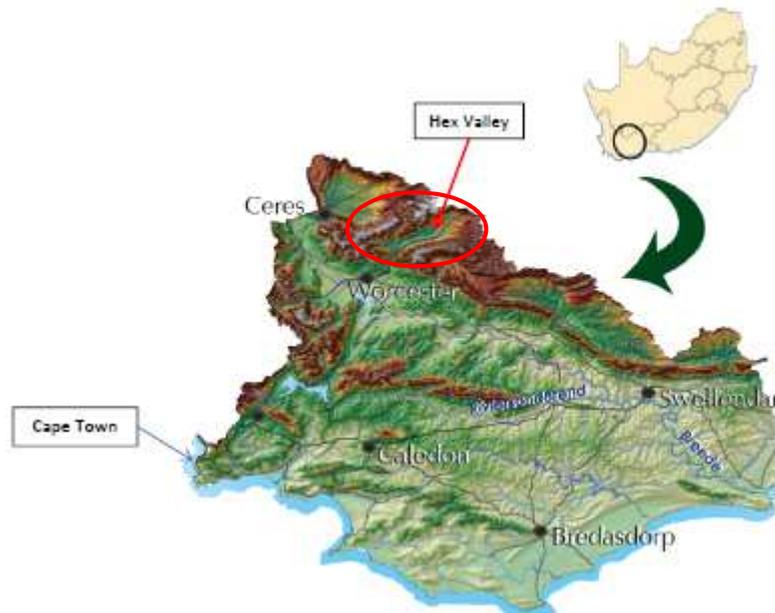


Figure 5: The Hex River Valley in South Africa

Since the 17th century, the Hex Valley was a centre of agricultural production, as it was situated along the early trek routes of European settlers taking possession of land in and around the Hex Valley on their way further inland. Fuelled by slave labour from around 1650 onwards, the Dutch East India Company ruled this part of today's South Africa (Ross 1983). Under Dutch law, farmland was given to European colonizers, encroaching the settlements of the indigenous people of the Khoi and the San (Funke et al. 2007). Their subsistence patterns of land and water use while nomadically following the rain in the country uniquely suited the landscape and land and water resources were communally owned, free for everyone to use (Guelke and Shell 1992). In an entirely different system of formal control over water and land through a legal system of private ownership, the land and natural resources used by the Khoi and San were soon divided among the white 'burghers' (settlers) of the Dutch East India Company from 1652 onwards.

³⁵ The Hex River Valley is also named 'Hexrivier' (Afrikaans language) or the 'Hex Valley'. Henceforth, I shall call it 'Hex River Valley' or 'Hex Valley'.

This strongly shaped socioeconomic developments in the Western Cape throughout the next 200 years. Among other aspects, it created a white land owning agricultural elite, while forcing African black people (and other slaves from the East Indies and other parts of the world) into separated and poor residential areas providing pools of cheap labour for white agribusinesses in “racialized relationships of servitude and dependency” (du Toit 2004, p. 10). These social developments did not come to a sudden end when slavery in South Africa was abolished in 1834, but it continued to shape socioeconomic relations of livelihoods of large-scale farmers and the livelihood strategies adopted by labourers and farm dwellers (Crais 1992). White identities of mastery were closely linked to the ownership of land and water and conferred with the perceived right to govern the lives of those that worked on this land (du Toit 2004). The Native Land Act of 1913 for example, saw 7 % of land as sufficient for indigenous African people, which at that time represented 66 % of the total population of by the time 6.1 million in South Africa. During the Apartheid regime (1948-1994) these power relations based on economic exploitation and a social segregation were ‘legally’ institutionalised in South Africa (van Koppen et al 2011). As a result, livelihoods in the Western Cape were determined by white domination through: national and local government structures; membership in political parties; by being the sole provider of some form employment and housing; by controlling land and water resources, as well as subsequent local food production chains; financial institutions and an informal network of loyal family relations (Interview Consultancy, November 2014, Worcester; du Toit 2004).

By the late 20th century, these socio-political and socioeconomic patterns were still dominating the Western Cape Province, especially the agricultural sector.³⁶ As a whole, post-Apartheid South Africa is still characterised by a “dualistic and racialised agrarian structure” (Cousins 2009, p. 900). On the one hand, a highly productive export-oriented large-scale irrigation farming sector exists, in which commercial farmland is owned as private property by white males of European descent (ibid.). On the other hand, densely populated settlements with high levels of unemployment and poverty exist with often more ten thousand black inhabitants³⁷ working as seasonal farm labourers for commercial farmers (Funke et al. 2007). This agrarian structure inherited from colonial and Apartheid times and is characteristic for today’s South Africa as a whole.

The white Republic controlled the bulk of available water resources under a system of riparian rights with licensing being overseen by the relevant state department with a strong focus on supporting irrigated agriculture in the country. The black homelands (reserves for indigenous black Africans and coloured people created by the white government) lacked access to water and no formal water entitlements were allocated to any black person. Law also forbade the possession of land by black persons outside the poverty-stricken homelands (van Koppen et al. 2011).

This socio-political and socioeconomic legacy largely influences today’s demographic situation and labour patterns in the Hex River Valley.

³⁶ For example, until the late 1990s farm workers were neither a subject to any labour regulations, nor were they by law allowed to be organised in labour unions (du Toit 2004).

³⁷ During research interviews and on transect walks through the settlements I have not seen a white inhabitant amongst the thousands living there. This was evident in both study areas.

5.2 SOCIAL CAPITAL AND DEMOGRAPHIC AND RESIDENTIAL PATTERNS

The demographic situation in the Western Cape Province was slightly different from those in the other parts of the country. Historically, the Provinces of Limpopo, Eastern Cape, KwaZulu-Natal, Mpumalanga and the Northwest comprised besides white settlements well connected to water infrastructure, the former 'homelands' for black and coloured people. The white privileged minority - accounting for only 13 % of the population and owning 95 % of the existing arable land - used up to 95 % of the available water mostly for large-scale irrigation (Mehta and Ntshona 2004). The former 'homelands' remained largely without connection to the water infrastructure (ibid.). Under the policies of the British colonial rule (1906-1948) and the following Apartheid regime, black African ethnic groups were dispossessed of land and access to natural resources, while being relocated to these 'homelands' (Kemerink et al. 2013). Forced to live in certain demarcated zones and given a little piece of land that was supposed to ensure small-scale forms of farming, the land's capacity was soon exceeded by the number of people trying to make a living off it (ibid.). As a consequence of a lack of any employment opportunities, 'homelands' as well as poor rural black communities became pools of cheap labour for white agricultural business and mining operations (du Toit 2004). However, the Western Cape had officially not contained 'homelands' (Interview senior manager DWS, June 2015, Pretoria).

However, today's Hex Valley was home to a population of 33 200³⁸ people according to an official census of 2011 (IDP, Breede Valley Municipality 2011). 7 700 were black Africans and 16 900 were coloured³⁹ people; 6 800 were white people of European descent and the remainder of 1 700 were people of mostly Indian and Chinese origin. However, the empirical evidence from this study area suggested that the combined number of people living in the Hex River Valley was much higher than 33 000, due to the large number of black, low-skilled migrant workers which lived in poor settlements not accounted for in the official census.

In between 5 200 hectares of privately owned farm land, four informal settlements existed in the Hex Valley: Stofland, DeDoorns East, Sandhills and Orchards. Figure 6 below shows the four settlements in a yellow colour. Historically, these settlements served as "refuges for many African people who evaded restrictive colonial and Apartheid laws to settle within or the peripheries of major urban centres" (Tapela 2012, p. 22), as well as centres of agricultural production such as the Hex River Valley and its neighbouring Ceres mountain area. The existence of these large settlements in the Hex Valley can be understood as a result of historical patterns of exploitative labour relations of colonialism, Apartheid and today's labour migration. They have throughout the last decades served as pools of cheap labour for the commercial farming sector (Cousins 2009).

³⁸ Numbers are rounded throughout this thesis to improve readability.

³⁹ The population registration Act 1950 of the Apartheid state segregated the people living in South Africa from 1948-1994 into categories according to the colour of their skin. Broadly those categories were: whites, coloureds, blacks and indians.

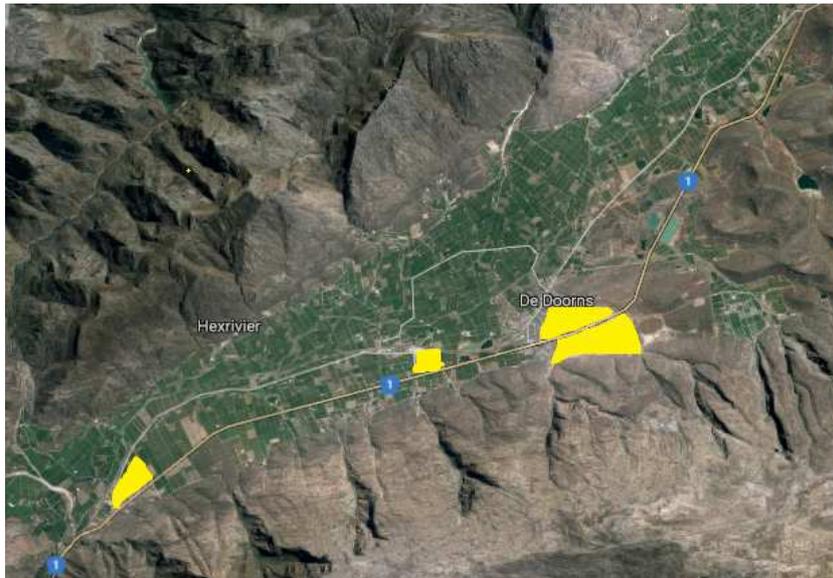


Figure 6: Poor settlements in the Hex River Valley

Due to the extremely crowded conditions in the settlements mainly caused by a high influx of migrant labourers from other parts of the country and from Zimbabwe, Nigeria and Botswana during the grape harvest, the categories of 'formal' or 'informal' housing were hardly applicable.⁴⁰ Backyard dwellings, a shack built out of cardboard, wood and/or metal plates, or simply a corner to sleep in one of the RDP⁴¹ houses, many of the people in the settlements called home. For example, in between recently built RDP houses (which meant a formal form of housing and was officially recorded) there were shacks of people dwelling in small huts of corrugated iron, cardboard, plastics and whatever materials available.

⁴⁰ Henceforth, I will label so called informal settlements in the Valley (DeDoorns East, Stofland, Sandhills and Orchards) as 'the settlements' or 'poor settlements'. The study of municipal documents and the interviews with municipal managers revealed that besides some minor differences in the actual residential patterns, income disparities and livelihoods, there is no clear differentiation between 'informal' or 'formal' housing. In between two rather formal houses, a shack was built or the backyard garden was 'rented out' allowing some informal dwellings. Furthermore, it can be reasonably argued that labelling a form of living as 'in-formal' is only possible through the existence of a dominant (state) narrative that constructs a form of living to be (legally) considered as 'formal'. This however makes it no less real for people calling a place home.

⁴¹ The small houses to the eastern side of the national highway (N1) had been constructed during in the last 5 years of the government's housing construction program, the Rapid Development Program (RDP). The program gives these types of houses their prominent name in South Africa, RDP-houses. It aimed at providing housing for the in 2003 approximately twelve million poor South Africans who otherwise would have dwelled in shacks of informal settlements (Lodge 2003). From 1994 until 2001 around 1 million houses had been built to accommodate approximately 4-5 million people, one third of the estimated 12 million people in 2002 without proper housing (ibid.).



Picture 1: Two RDP houses and adjacent shacks in the settlements of Stofland

However, under the Apartheid regime the small town of DeDoorns and practically the whole Valley were separated by a railway line, which today was no longer in use. It ran through the heart of the valley and it was a visible barrier for racial segregation and today served as socioeconomic divide between the previously exclusively white section of the town and the zone for black, coloured and other ‘non-white’ people (IPD Breede Valley Municipality 2013). Approximately 85% of the white inhabitants in the study area were part of the commercial farming community. Many of them had a similar family origin bearing the same name and were to some degree related. According to the official census of 2011, the vast majority (5 140) of the white population lives on their privately owned farmland in mostly larger houses and grand farm estates situated within the vineyard area in the south-eastern part of the Valley (ibid.).



Picture 2: Settlement of DeDoorns East, central square

According to the latest census of 2011 only 570 coloured and black people lived in the same area as the majority of the white population. According to participants, this number was made up of mostly permanent farm workers, residing in special housing for workers on the farm provided by the farm owner (IDP, Breede Valley Municipality 2013). This also coincided with my own observations during transect walks, research interviews and informal conversations with commercial farmers and farm workers. In total, 90 % of the white population lived in mostly large family estates or in the better situated areas of town of De Doorns edging the farms on the northern side of the town.



Picture 3: Farm estate in the Hex River Valley of a research participant from the group of commercial farmers

Figure 7 below shows the two settlements of Stofland (in yellow colour); DeDoorns East (orange); the better situated parts of small town of DeDoorns (pink colour); a golf course (green colour) and the offices of the Hex Valley WUA (blue colour). The remainder of the Hex Valley was farmland owned as private property (except for the settlements of Sandhills and Orchards, in yellow in Figure 6 above).



Figure 7: The town of DeDoorns and the settlements: the better situated parts of the town of DeDoorns (pink); Stofland (yellow); DeDoorns East (orange); the offices of the Hex Valley WUA (blue rectangle) and a golf course (green). Next to the golf course a large on-farm dam privately owned by a commercial farmer is visible.

However, the racial divide of the Apartheid era, made way for a socioeconomic divide mirroring the historical conditions of societal segregation and economic exploitation of black workers. In short, around 25 000 people lived under conditions of poverty in the settlements and provided their labour to the agribusinesses of 70 commercial farmers farming table grapes for European markets. Still, the poor settlements served as pools of cheap labour for the 120 farms on 5 200 hectares of privately owned farmland.

5.3 NEXUS OF DEMOGRAPHIC FACTORS AND WATER ACCESS

Besides the socioeconomic divide in terms of housing patterns, another demographic characteristic of the Hex Valley was rapid population growth. The Hex Valley was a hub for low-skilled labour migration of seasonal farm workers mainly from other South African Provinces, but also from Zimbabwe and Nigeria travelling from harvest to harvest, many of whom became 'stranded' in the Hex Valley mostly lacking the money to travel further.

In the last ten years the population in the settlements of Orchards, Sandhills, DeDoorns East and Stofland increased rapidly. However, reliable census data was not available and recent demographic studies of the composition of these settlements did not exist. The latest census conducted in 2011 did not account for migrant workers who stayed for the harvest season in between April and November. In addition, by the time the census was conducted in 2011 the large settlement of Stofland was still under construction. However, the aerial pictures below compare the size of the settlements and show the magnitude of the population growth over the last ten years. In 2002 an estimated number of 2 100 people lived in DeDoorns East⁴² (yellow outline in picture below), the area below the railway line and above the N1 highway (Report of Breede Valley Municipality 2002). This number had increased by "maybe 5 000 or so" (Senior manager of Breede Valley Municipality April 2014, Worcester). But the majority of newcomers of labour migrants seeking work on the farms had found a shack, a space in a backyard dwelling or a room to sleep in an RDP house in the newly constructed settlement of Stofland⁴³ (red outlines). According to the Internal Development Plan of the Breede Valley Municipality the settlement of Stofland was planned for up to 3 300 people and the number was then simply extended to 6 000 (IDP 2012).



Picture 4: Stofland (in red) and DeDoorns East (yellow) in 2006 (Google maps, picture obtained from Breede Valley Municipality in 2014)

⁴² DeDoorns East was furthermore sub-divided into areas called 'Majoks', 'Hassie square', 'De Wet' and 'Ekuphumleni'. Research participants from those three areas were subsumed under 'DeDoorns East' for the sake of readability.

⁴³ Stofland in the Afrikaans language means 'land of dust'. This was an accurate description of the living conditions in Stofland, as the area was dry and dusty with sandy winds rushing through the alleys in between the RDP houses and shacks. The earth held little to no moisture in the top soil layers. Picture 5 shows the sandy light-brown colour of the soil in Stofland; this condition made subsistence agriculture challenging at best, but definitely very water intensive (pers.obs.).

However, the Breede Valley municipality confirmed that knowledge about the exact number of people living in Stofland was not available, but was estimated to “be maybe around 10 000 to 15 000” (Senior water manager Breede Valley Municipality, September 2014, Worcester). However, other estimations of the number of people living in Stofland total 50 000 during the harvest season (IRIN 2014).



Picture 5: Stofland and DeDoorns East in 2016 (area below the N1 highway) (source: Google maps; accessed: December 2014)

The high influx of labour migrants made it “difficult to keep track of the people”, the senior municipal manager of the Breede Valley Municipality (September 2014, Worcester) explained:

So the influx of people will park in DeDoorns and use it as a hub. So when people come from the Eastern Cape or from Zim [Zimbabwe] or somewhere else, they stop on the N1, which is a major migration route. They camp in DeDoorns to relaunch to other parts from here. But not all of them leave again.

Most of the migrant workers arrived in DeDoorns for the grape harvest in the Hex Valley during the months from April to November. Thousands of those seeking a better life and better job used the Hex Valley as a central hub for work migration (see also Theron 2010), because South Africa’s major highway N1 ran through the Hex Valley towards Cape Town. The four settlements were thus growing constantly and especially ‘swelled up’ during the harvest season (Cousins 2015).

This demographic reality resulted in enormous challenges regarding municipal human, financial, and physical infrastructural capacities to ensure water supply and adequate sanitation, waste removal, education facilities and health services and many more. The settlements grew faster than the local authorities could cope with in terms of planning for housing and other municipal services like water supply or electricity. With temperatures of below zero in winter and above 30 in summer, this provided a health risk to the poor living in the four major settlements. This enormous demographic challenge, however, stood in stark contrast to the limited human and financial resources and capabilities of the Breede Valley municipality (and its local branch in the town of DeDoorns) to cope with the rapid developments. As municipalities in South Africa were mostly funded by the South African government, a lack of funding on municipal side was also an expression of a lack of financial resources of the national government in general (Senior water manager Breede Valley Municipality, September 2014, Worcester). For example, the provision of adequate water supply and sanitation

facilities to the informal settlements, as well as housing provided a major challenge for the local authorities. A senior official mandated with water supply services explained they were “constantly fighting fires”, re-acting to ever-increasing challenges, while lacking the resources and capabilities to be pro-active and preventive (ibid.):

In reality, most municipalities do not have enough resources to do the job and we are no different here. Unfortunately, that are South African realities, you can see it here in Stofland, Sandhills and Orchards. It is a huge challenge for municipalities. I don't have enough money or skilled staff to provide enough services to the already existing people.

The housing problem was a practical example contrasting fast-paced developments of population growth with the slow-paced reactions of South African authorities. The Rapid Development Program (RDP) of the South African government sought to provide free housing for indigenous people with an income lower than R 1 800 per month (approximately 177 AUD) (Senior water manager Breede Valley Municipality, September 2014, Worcester). However, the empirical insights show that most of the people were living on R 1 800 a month or below rented out their newly obtained house to other people, in order to earn a little side-income and remained in whatever form of housing they were living in before (September 2014 Stofland; December 2014 DeDoorns East). Most often this provided the only form of regular income for those living in the informal settlements. Furthermore, due to a lack of residential provisions and a continuous influx of migrant workers over the last ten years, what was planned as a formal settlement for around 3 300 people living in RDP houses, had become a social melting pot of ten thousands of people with no regular income, besides the earnings from the seasonal farm labour and domestic work. Seasonal farm workers had a monthly income of around R 801 - 1 600; some had an income of more than R 1 600 (IDP 2011).

However, in some cases up to ten people lived in one of the RDP houses on mostly 40 square meters, which often had an informal dwelling next to it, sometimes home to another two to three people. Concerning water supply, this meant that in many instances instead of the planned four people per tap of communal water supply, the number of water users was three times higher than planned for by the municipality. The same was true for the chemical toilets or improved pit latrines prevalent in Orchards, Sandhills, Stofland and DeDoorns East. Most of the approximately 2 500 RDP houses were equipped with flush toilets.

As a consequence, the water consumption in the settlements was significantly higher than the projections of the year 2013 of the municipality had estimated. An internal document of the municipality stated: “since the projected current and future demands exceed the combined yield of the available sources of Grootkloof [mountain gorge] and Hex Valley Water User Association of 850 MI [850 000 cbm] annually, the DeDoorns bulk water supply has insufficient capacity to meet current and future water demands (...)” (IDP 2013).

The existing water resources of the municipality consisted of mountain runoff from the Grootkloof on the eastern side of the mountain range abstracted through diversion boxes in the runoff gorges, from one municipal boreholes and water purchased from the Hex Valley WUA (HVWUA). However, this amount of water was not sufficient to supply all inhabitants of DeDoorns and the settlements. Due to a lack of financial resources and human capabilities, the municipality was not able to manage

their existing water resources adequately or had lost track of them entirely due to changes in land ownership. “When I came in here five years ago, I tried to find the municipal boreholes. There were supposed to be three, but I could only find one” said the municipal bulk water manager in 2015. A current deficit of 100 000 cbm for the year 2013 in the drinking water supply for the town and settlements was reported by the municipal water manager as increasing every year by the same amount. A gap in the municipal water supply capacities of 300 000 cbm existed in 2016.

This lack of water resources controlled by the municipality for the supply of the population of the Hex Valley with drinking water made it necessary to buy water from the Hex Valley WUA, while it also took over municipal responsibilities of supplying water to the settlement of Sandhills. To Sandhills water was supplied via underground pipelines by the HVWUA into five storage reservoirs with water from the Sandrift scheme. For this service the municipality paid the HVWUA R 1.24 per cbm. However, this water did not comply with South African drinking water standards. It was delivered through the Sandrift scheme, but it was not treated in the small municipal treatment plant in DeDoorns beforehand, although the 1.24 Rand per cubic meters had factored in the treatment costs, as other domestic users paid the same price. But the Constitution of the HVWUA did not specify an obligation to supply drinking water, but only irrigation water. However, the storage reservoirs for drinking water were not in a functional state, except for one of them (picture 6 below displays them). The CEO of the HVWUA said they “only got water for a couple of days”, because the amount of water stored in the one functioning reservoirs “lasts them a week maybe” (CEO of HVWUA, April 2014, DeDoorns).



Picture 6: Drinking water reservoirs for Orchards - One out of five was functional (covered with a corrugated iron)

In contrast to that, members of the white commercial farming community and inhabitants of the better-situated parts of the small town of DeDoorns, enjoyed a constant water supply. They either abstracted groundwater from private boreholes on their property, or had a municipal in-house connection, or both. However, for a Valley fortunately located on a large underground water reservoir, with mountain runoff, water from the Hex River and annual average precipitation of around 500 mm, water for human consumption was surprisingly scarce - at least for the poor living in the settlements. All participants, but especially staff interviewed from the CMA, the WUA and the commercial farmers subscribed to the same dominant narrative of the Hex Valley as a ‘water scarce area’. A closer investigation of the geo-hydrological characteristics and the social distribution of the available water resources was thus imperative.

5.4 BIOPHYSICAL AND NATURAL CAPITAL

The Hex River catchment is a sub-catchment of the larger Central Breede zone, which is the largest sub-catchment of the Breede River catchment. Within a typical inland climate with hot and dry summers and cold, wet winters, the temperatures in the Hex River catchment varied in between +40 and -4 degrees Celsius. Mean annual precipitation varied greatly within the course of five years, but accounted for around 500 mm (DWA 2000; UMVOTO 2011). Precipitation occurred only during the winter months of mainly June, July and August and the water was captured in three storage dams: Lakenvallei, Roode-Elsberg and Osplaas dam, the latter only to a limited extent. From the Lakenvallei and Roode Elsberg dam water was released for irrigation purposes (and to a limited extent urban supply) during the hot months of summer. Due to high evaporation rates the annual firm yield of the two dams accounted 11 million cubic meters of water with a reasonable quality due to their location in the mountains, far away from any human influence.

The high rising Matroosberg Mountain ranges (1 900 - 2 200m) to the north-east and a south-eastern mountain range were part of the geological formation of the Table Mountain Group (TMG) (Jia 2009) and encapsulated the Valley. The Valley rested on two geological formations of fractured aquifers: the TMG comprised the two mountain ranges and part of the Valley bed towards the foot of both mountains and a layer of so called Bokkeveld Group rocks (shale). Both were classified as semi-confined to confined with arenaceous and brittle rock formations, in which faulting and fracturing was prominent (ibid.). The geo-hydrological yield of the area was assessed with greater than five litres per second that can be taken out of an average borehole, the highest yield rating in the Western Cape Province (ibid.). In other words, the Hex River Valley was located on fractured rock formations that were able to hold a significant amount of water.

The Hex River itself originated from a number of mountain streams draining the southern slopes of the Hex River Mountains. Major tributaries were the Amandels and Sandrift Rivers, which, after their confluence in the south-western part of the Hex Valley flew into a southerly direction joining the Breede River near the town of Worcester, an hour's drive towards Cape Town. A small stream comprising excess mountain runoff, which was not directly captured in large on-farm dams of commercial agriculture; the Hex River ran from the northern side through the Valley joining the Amandels and the Sandrift River confluence before flowing towards the town of Worcester.

However, the riverbed of the Hex River had been altered numerous times with changing property boundaries and was bend to serve the purpose of providing irrigation water. Extensive clearing of riverbank vegetation and anthropomorphic modifications of the in-stream flow due to sandstone mining led to an erosion of the riparian zones. The river had to be "cleaned up and straightened to keep it stable" as commercial farmers explained (Commercial farmer CF B, April 2014, DeDoorns). This had however rather resulted in high sediment and also nutrient loads due the extensive use of fertilizer on the grape fields on both sides of the river. Low oxygen levels and a eutrophic ecological state of the river were the consequence. Picture 7 below shows this (DWS 2011).



Picture 7: The Hex River in the Western Cape Province

Enquiring with the municipal bulk water manager from the Breede Valley Municipality about the gap of 300 000 cbm in the supply capacities to the settlements and the poor parts of the town, he answered: “There is water, but it is unfortunately locked up in historical entitlements and I can’t touch it”. He indicated the gap in the municipal water supply would be due to historical Schedule 4 water entitlements. A CMA’s senior manager also said: “94 % of all the available water resources is used for irrigation” (Water use control officer of Breede-Gouritz CMA, September 2014 Worcester).

However, before I analyse these crucial statements further, in the following, I present research findings regarding land ownership, labour relations and social consequences. This serves to augment the understanding of the general livelihoods in the Hex Valley. It also provides empirical findings linking the limited amount of water available in the catchment to white land ownership and related historical water entitlements.

5.5 ECONOMIC, FINANCIAL AND PHYSICAL CAPITAL

The Hex River Valley presented a rather 'contained' area, accessible⁴⁴ only from the northern and the southern side through the major highway N1. For more than two hundred years, the economic activities in the Hex River Valley centred on the commercial cultivation of one product: table grapes.

The picture below presents a typical view from within the Valley showing the table grape farming area in the southern parts of the Hex River Valley towards the Matroosberg Mountains.



Picture 8: Table grape farming in the southern end of the Hex River Valley towards the Matroosberg mountain range. The picture was taken by myself standing on the N1 highway.

On approximately 120 farms in the valley owned by 70 producers, on approximately 5 200 hectares 25 - 50 % of the national table grape production was produced - around 18 million cartons per year, depending on overall yields. The generated tax revenue from exporting the grapes mainly to European, but also Middle Eastern markets, accounted for approximately 200 - 300 million South African Rand (20 - 30 million AUD) a year, depending on the annual agricultural yield and international market prices for table grapes (Commercial farmer CF C, April 2014 DeDoorns; Senior water manager Breede Valley Municipality, September 2014, Worcester).

Livelihoods in the Hex Valley depended on the cultivation of table grapes and the subsequent packing industry. This was besides a limited number of existing subsistence food gardens in people's backyards in the settlements. No other economic activities existed with the potential to create jobs (Theron 2010). The harvested grapes were packed in on-farm packing facilities owned by commercial farmers into export-ready cartons, as we know them from the supermarkets. However, besides 15 - 20 jobs in local retail shops and the local petrol station, no other local job opportunities existed. Apart from agriculture, there was virtually no other economic sector present, making farm labour and the jobs in the subsequent packaging of grapes the only source of employment in the Hex Valley (see also Theron 2004; Saruchera 2008). The grape cultivation normally extended from September/November to April/May (WaterWatch 2013).

⁴⁴ A dirt road existed through the southern mountain range, which was hardly used any more.

Changes in the agricultural sector and the labour relations were few. For the last 100 years, besides modernizations of production and grape cultivation techniques for an increasingly globalized export, the socioeconomic patterns of production and labour relations in the Hex Valley remained the same (Senior water manager Breede Valley Municipality, September 2014, Worcester). Indeed, the four settlements where thousands of the poor lived, still served as pools of cheap labour for the (white) commercial farming elites. Despite the finding that the overall area under cultivation had increased, additional jobs have not been created (Theron 2010). Similarly, official labour statistics for the country including the Western Cape Province show a steady decline in the number of jobs available in the agricultural sector (ibid.). Another aspect regarding labour relations was important here: none of the farm workers in the Hex Valley entered work relations on the basis of a written contract of employment that would prescribe the salary, working hours and other factors determining the working conditions. This can be described as the opposite of transparency and accountability.

However, the existence of an informal labour market in the agricultural sector of developing countries, but also in developed countries, is a widespread phenomenon. For national governments and regional authorities this often presents a political dance on the intersections of pragmatic job policies and moral and ethical constitutional obligations. In other words, the socioeconomic patterns in the Hex River Valley might be called highly unfair, but the commercial farming sector also created around 15 000 to 20 000 seasonal jobs for the poor and low-skilled inhabitants of the Hex Valley.

Nevertheless, mindful that 'the poor' or 'people from the settlements' or 'community' never represents a coherent category of homogeneously organised people, the critical point here is not the creation of seasonal labour opportunities, but the lack of legal accountability and control (as further analysed in the next subchapter). The perceived risk of being "chased away" and losing one's job was prevalent amongst all participants from the settlements (please see the contextual overview tables in the Appendix 2 for a detailed analysis of the livelihoods of the three water user groups).

Accordingly, financial resources of people living in the settlements were largely limited. All participants working on the farms lacked any form of financial or material wealth and were not able to afford to save some of their small daily salary of around 70 - 110 South African Rand. The cost for a litre of milk in the local supermarkets was 18 - 20 Rand by the time of this research. All participants, regardless of gender, lived from hand to mouth. Job opportunities besides the hard labour on the farms of commercial farmers were not existent, except for the subsequent packing of the grapes, a job, mostly performed by women. However, all participants were highly dependent on this form of work as the only way for the poor to support the life of their family and children. Speaking about the living conditions in the four settlements the senior manager from the Breede Valley Municipality said (September 2014, Worcester): "But what is a decent living? Me and you take it from granted to get at least some protein on the plate at diner, but for them a piece of bread and a sip of milk that's a meal."

The livelihoods of the group of emerging farmers were slightly more stable. A regular income, means of transport for private and for agricultural purposes, access to health facilities due to available means of transport, adequate housing and the possession of a small piece of land were their assets in pursuing their livelihoods. The access to finance was however described as a great challenge: the banks regarded them as high-risk clients and gave no loan or credit to emerging farmers. The

government grant was welcome, but also provided an administrative hurdle and timely burden due to large administrative backlogs at state Departments. In contrast, commercial farmers faced no existential financial challenges. They owned private property with a considerable financial value; were able to save money, send their kids to school and University and had easy access to credit being the preferred clients of local banks. For a more detailed analysis please see the contextual overview table, as well as the analytic narratives in Appendix portraying a typical day of participants of this study of the three water user groups.

In this nexus of demographic realities and socioeconomic dependency in the Hex Valley,⁴⁵ a 'marginal class' existed consisting approximately 15 000 to 20 000 seasonal farm labourers with approximately additional 20 000 as dependants on those that have work. They were working for a 'core class' of 70 large-scale white commercial farmers and their extended families (see also Seekings and Natrass 2005). The labour unions did not present a strong force in the Hex Valley. A seasonal farm worker explained: "No, nothing has changed here. We work for the farmers, like my father before me. It is not nice" (Farm labourer from DeDoorns East, September 2014).

This presents an account of power-over, of contextual power, i.e. to create conditions others are implicated in and to influence the livelihood capitals of others. Without a working contract, without labour unions present and with hugely limited government controls of working conditions, the low skilled black workers were left vulnerable to decisions of commercial farmers. For example, the farmers were legally obliged to pay the minimum salary to their on-farm and seasonal workers, but did not always do so. If a worker had been ill for one day, he was mostly fired the next day and somebody else had taken up his job. I have also recorded instances, in which a farm labourer and been chased away as 'trouble-maker', because he complained about the working conditions or had simply spoken to his fellow workers about it. As such, the commercial farmers, directly and indirectly, influenced the financial livelihoods capitals of the poor. This power, hidden in the socioeconomic context, had significant consequences for the thousands of low-skilled black farm workers living in the settlements. For example, the long and tiring working hours (10 to 14 hours of farm labour) from mostly 06:30 in the morning to 20:00 or 21:00 left no time for social activities. During the harvest work continued on the weekends. The poor families depended on every cent earned, they could not afford to lose one day's salary. The direct consequence of this dependency was that farm workers had to leave their children unattended at home in the settlements for 10 to 14 hours without food and without control of what they were doing. Being hungry they would eat whatever they could find, often causing diarrhoea or worse illnesses. Drug addicted and drug trafficking young children under and above ten years was a consequence of the above (pers.obs.; Interview child nursery, Stofland 2015). Another direct consequence was that in effect the farm workers had no physical energy left after a couple of days of working. They were so exhausted that they described to have no energy to engage in politics, let alone trying to find information about

⁴⁵ People from the School of Governance through their PLAAS initiative (Programme for Land and Agrarian Studies) at the University of Cape Town monitor within their research activities the socioeconomic nexus of livelihood opportunities, farm labour and chronic poverty in the broader Hex Valley (du Toit 2004; Cousins 2009; Theron, 2010). Their work provides excellent insight into the local socioeconomic context.

water governance in the area or to understand the system of water distribution. Of course, they were not forced to work. But in South Africa no public healthcare, transportation system or reliable welfare system exists and most people depend on their jobs for their survival or that of their family members. Please see the contextual overview tables in the Appendix 1-7 for further detailed consequences of the exploitative labour relations.

In the following section, it will become clear that the very same farmers, who controlled the labour conditions of thousands of poor people in the Hex Valley, also controlled the water distribution infrastructure in the Hex Valley. Moreover, they had control over the physical water resources as well through their ownership of the reticulation infrastructure.

5.6 PHYSICAL CAPITAL: HYDRAULIC INFRASTRUCTURE AND WATER ACCESS

The Lakenvallei and Roode-Elsberg dam in the Matroosberg Mountains were owned by the infrastructure branch of the DWS. Both dams were situated in the Matroosberg Mountains in approximately 15 Km and 10 Km distance to the town of DeDoorns. They had a combined storage capacity of 18 million cbm and a firm yield of around 10 - 11 million cbm annually depending on temperatures and subsequent evaporation rates (DWS 2017; CEO of HVWUA, April 2014, DeDoorns). The two dams were constructed in the 1970s by the Dept. of Water Affairs of the Apartheid regime and connected to a system of storage dams and reticulation infrastructure - this was called the 'Sandrift irrigation scheme'. It also comprised a tunnel through the foot of the Matroosberg mountain range and an underground pipeline system through which water was distributed to the commercial irrigators throughout the Hex Valley. Besides minor allocations to local guest houses and a small hotel, both dams provided primary storage for irrigation purposes of the members of the HVWUA.

In the early 1990s during the transition to the first democratic government in South Africa, the HVWUA⁴⁶ bought the distribution infrastructure from the government (CEO of HVWUA, September 2014, DeDoorns). As such, the dam itself and the water stored in it, belonged to the Department of Water Affairs as the custodian of all water resources in the country (NWA 1998), whereas the distribution infrastructure was the property of the HVWUA. The total of around 11 million cbm from these two dams was fully allocated to commercial irrigators per hectare of irrigated land, as part of their historical water entitlements. This distribution system from the dam outlet to a cascade of the weirs and diversion boxes was operated via a computerized system by the CEO of the HVWUA.

⁴⁶ By that time the Hex Valley WUA was officially called Hex Valley Irrigation Board under the old Water Act of 1956.

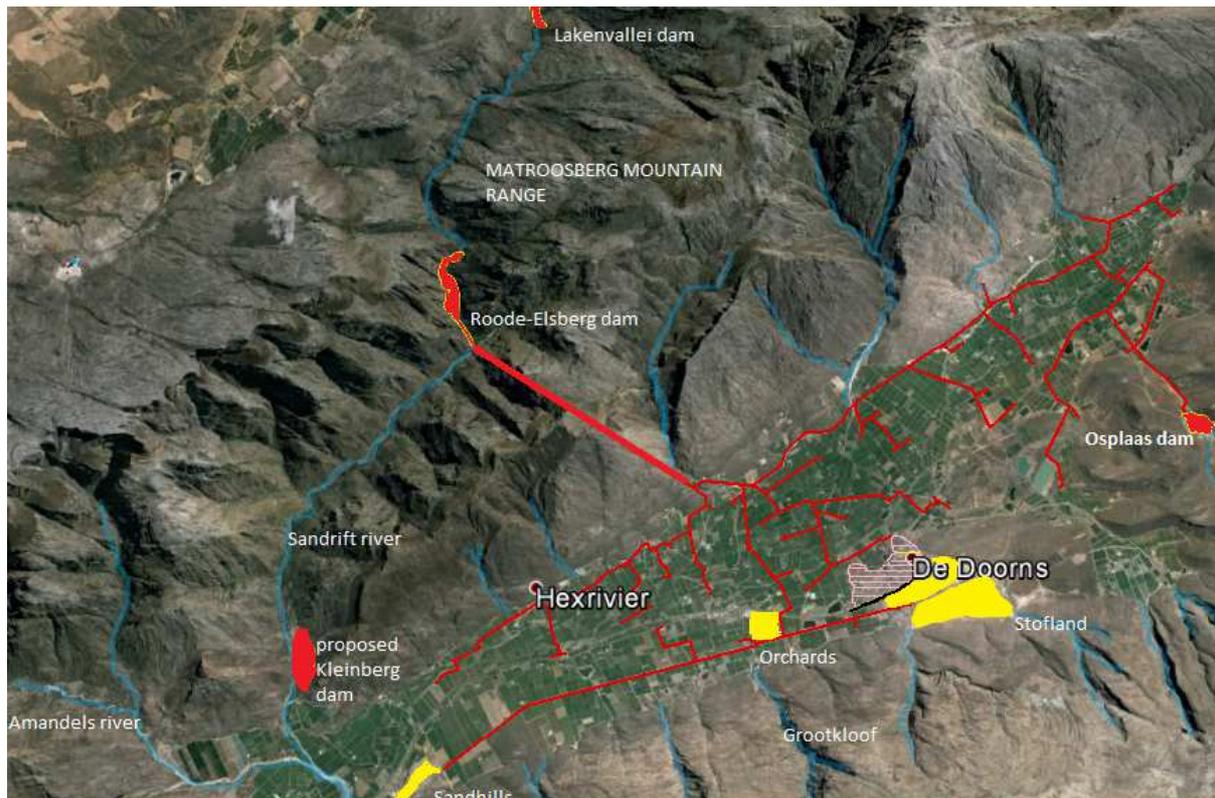


Figure 8: Underground pipeline system, tunnel and dams (red), settlements (yellow) and mountain runoff (blue) (Google earth based file, pipelines as per original file from the Hex WUA 2014)

However, the yield of the Sandrift scheme was fully allocated due to over-optimistic estimates of the yield (Umvoto 2011). “As a result water was supplied with relatively low assurance and there is intense competition between the water users” (ibid., p. 9). The Umvoto hydrological consultants in their 2011 assessment of the Hex Valley water supply situation had found this to be true for the entire water supply of the inhabitants of Valley. Their results also stated that water had been a source of disputes among the commercial farmers for centuries and has now manifested even more strongly in the post-Apartheid period as more users were added to the system. My findings, however, largely contradict the finding of a low assurance of supply - at least for the commercial irrigation sector. None of the six commercial farmers interviewed for this study complained about a lack of water and none of them stated that it would present a threat to their current business. Furthermore, arguing that additional users would be the main reason for a low assurance of supply was convincing at first glance, but considering the fortunate geo-hydrology of the Hex Valley catchment with available ground water and a mean annual precipitation of around 500 mm per year, this seemed an unrealistic statement. Also, in the light of another finding regarding water use for irrigation purposes this becomes clearer: most of the commercial farmers in the Hex Valley were in the process of replanting 30% of their fields with new and larger grape varieties, which would also use around 30% more water per kilogram of table grapes. “But with the bigger varieties you can waive the 7 500 cbm [crop requirement for table grapes per hectare] goodbye. They need around 10 000 cbm” (Commercial farmer CF C, September 2014 DeDoorns). Despite the prospect of this additional need of water, none of the commercial farmers was concerned about the assurance of supply. One of them said (CF D, April 2014, DeDoorns): “Yes, we have got the water for that. I couldn’t plan for the new varieties without it”.

So, there was apparently sufficient water available for the commercial farming sector to increase the production with even larger table grape varieties. From a hydrological perspective the Hex Valley might be considered water scarce in terms of available surface water, but the thousands of pumps abstracting groundwater augmented the water supply of commercial farmers from the two dams by approximately another 25 million cbm. In addition, in 2009 another dam had been constructed: the Osplaas dam with a storage capacity of 2.7 million cbm (IDP, Breede Valley Municipality 2012). This gravel dam (see Figure 8 above) was also privately owned by the Hex Valley WUA and used for storing water not used during the irrigation period and as a backup ensuring the supply of the commercial irrigation sector.

Noteworthy, the emerging farmers, let alone the poor living in the settlements had neither of these options of accessing water, nor had they control over water infrastructures. They lacked the financial and human resources and capabilities to drill a borehole for their farming activities grand or small, let alone initiating and paying for the construction of a dam. This, I will further analyse in the next Chapter. However, as land ownership and historical water entitlements go together, those who owned the land were allocated with the Schedule 4 license of ELU per hectare.

5.7 PHYSICAL AND NATURAL CAPITAL: LAND OWNERSHIP AND WATER ACCESS

Arable land in the Hex Valley accounted for 5 200 hectares on approximately 120 privately owned farms. The farms were often split up and did not necessarily present on a coherent area, which is why farm sizes ranged from 30 to over 500 hectares (LBO list of property sizes, obtained from HVWUA; Farmers Weekly Newspaper 2012). However, the total number of table grape producers in the Hex Valley had decreased from 120 owners in 2012 to around 70 owners in 2013, concentrating land ownership into a few hands. This was mainly because some commercial farmers enlarged their property by purchasing land from other farmers (Commercial farmers CF 1-3, April 2014, DeDoorns). Figure 9 and Figure 10 below depict this trend.

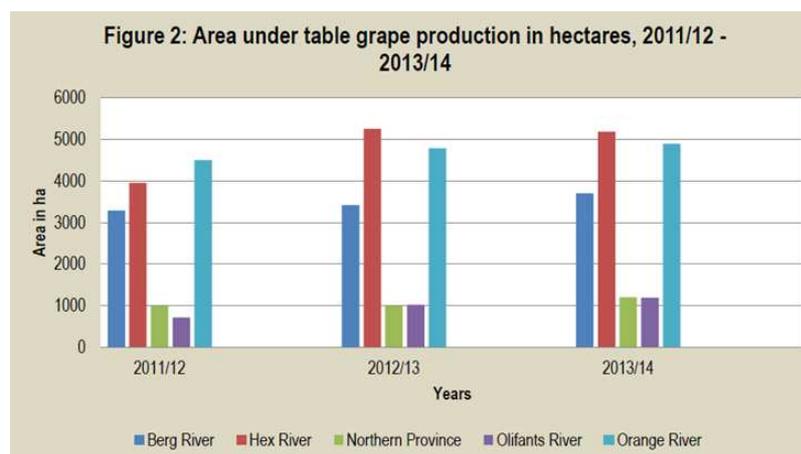


Figure 9: Area under table grape production in South Africa, 2011 - 2014 (SATI 2013/2014)

Nevertheless, the important finding here is that 99.3 per cent of the available 5 200 hectares of arable land in the Hex Valley were owned as private property by approximately 70 white commercial farmers and their extended families. Most farmers owned more than one farm, or they were part of large family consortiums owning different farms (Senior water manager, Breede Valley Municipality, September 2014 Worcester; pers.obs.).

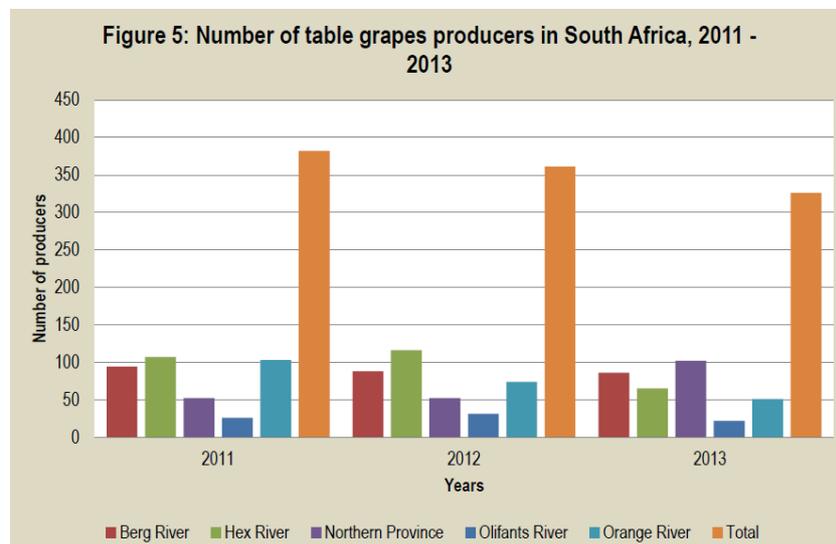


Figure 10: Number of table grape producers in South Africa from 2011 - 2013 (SATI 2013/2014)

For example, the largest farm consortium in the Hex River Valley owned 12 viticulture farms in the Hex River Valley with a combined property of around 500 hectares confirming the trend of the concentration of land ownership in a few (white) hands. One of the largest commercial farmers (CF D) in the Hex Valley explained: “Me and my brother have bought a lot in the last years - around 110 hectares in the Hex”.

This relates to an aspect prevalent for the livelihoods of commercial farmers in the Hex Valley. Four of the six commercial farmers interviewed in the Hex Valley owned additional property at the Orange River or in the Karoo region north of the Hex Valley farming cattle or sheep. This served the purpose of balancing the economic risk of facing a drought or sudden increases in input prices like fertilizer or seeds. It however, also shows that the livelihoods of the commercial farmers in the Hex Valley were largely diversified and exemplifies why they were described as “stable” and “good”, not only having a sound livelihood foundation in the Hex Valley, but also having alternative economic and financial options to cope with shocks and risks.

Besides commercial farmers, only a very limited number of black emerging farmers practiced commercial agriculture in the Hex Valley. In total, the amount of land that emerging farmers owned accounted for 38 hectares, which is 0.7 % of the total arable land in the Hex Valley. One of the members of the Management Committee (MANCO) of the Hex Valley WUA said: “BEE [black economic empowerment] in the Hex Valley is almost not existent” (Vice president of the HVWUA December 2014, DeDoorns). Another commercial farmer confirmed this by saying “I know only three black guys that are farming here and without us they wouldn’t be here” (CF A, December 2014, Worcester). The senior water manager from the Breede Valley Municipality also confirmed this.

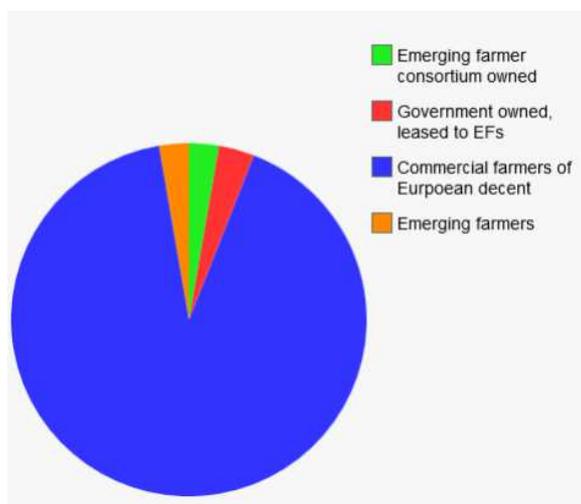


Figure 11: Land ownership in the Hex River Valley (compiled by author)

However, water for productive purposes stored in the three major dams was ‘tied up’ in fixed allocations per hectare of irrigated land. These quantities were allocated as historical water entitlements from the Apartheid era (Existing Lawful Use) and tied to the person who owned the land as an official Schedule 4 water use license. As such, 90% of the water used by commercial farmers in the Hex Valley was a guaranteed, historical water allocation having its roots in the Apartheid era. The CMA senior manager and control officer for water use (December 2014, Worcester) confirmed that “90% of the water used for irrigation is Existing Lawful Use”.

In contrast to this, three agricultural projects for Black Economic Empowerment (BEE)⁴⁷ existed in the Hex Valley. All lacked access to sufficient amounts of water. The Osplaas ‘boerderey’ (Afrikaans language for ‘farm’) was a project of in total 34 people who farmed table grapes on 12 hectares. One of them explained: “We are doing ok most of the time, but we don’t have enough water”.

⁴⁷ A detailed description of these projects was not feasible in this thesis. However, they all received funding from different grant schemes from the Departments of Rural Development and Land Reform and Water Affairs and Sanitation. This was mostly a once off lump sum payment in the beginning of the farming project and subsidies to be applied for regarding different farming inputs such as fertilizer and subsidies for physical assets such tractors, pipes, fences etc. However, the conversations and research interviews with emerging farmers and other research participants in the Hex Valley, emphasized that: the timely backlogs at governmental administrative authorities in processing a subsidy applications are very long and applications were sometimes answered up to two years later, if at all (Emerging farmers EFs 1-5 2015; see Mochotli 2010). This would make effective farming almost impossible, because a meticulous business planning is necessary to farm profitably. Besides the administrative hurdles, most of the applicants from the group of emerging farmers had no formal education. Through their mostly life-long work on the farms of commercial farmers they had acquired substantial knowledge about the practical side of farming table grapes, but they had “never been business man” and “did not know the business side of farming” (Interview Consultancy, November 2015, Worcester; see also Tapela 2011).

Two other projects of emerging farmers in the Hex Valley faced the same challenge regarding access to water for productive purposes: on the plots of the 'Uitkoms' collective in the north-eastern part of the Hex Valley around 30 people worked the land on 14 hectares, of which 40 per cent was owned by the group of emerging farmers and the remaining 60 % was owned by two commercial farmers (Emerging farmers EF 3, 4 December 2014, DeDoorns). This represented the farming arrangement according to a mentorship model of the Agricultural Support Program⁴⁸ of the South African Department of Agriculture, Forestry and Fishery in South Africa. However, two other emerging farmers farmed wine grapes on the 'Sandrift' farm owning approximately 12 hectares (Emerging farmers EFs 1 and 2, April 2014, DeDoorns). The amount of water that they received from the HVWUA of 11 000 cbm per year was only sufficient to irrigate 1.5 hectares; the other 9.5 hectares had to be left fallowing. All of the small-scale farming endeavours by emerging farmers were situated in the north-eastern side of the Valley near the newly built Osplaas dam, but all of them complained about a lack of water to farm profitably.

For the poor living in the settlements, access to water for productive purposes presented a major challenge. I found that they had no access to such water at all. In their daily realities no distinction between water for human consumption and water for productive or economic purposes existed. The water provided to the settlements by the municipality was used by the poor for multiple purposes of sanitation and hygiene; as drinking water; for cooking purposes and other daily activities. At the same time, it was utilised for watering animals, a small backyard garden growing mostly beetroot, spinach, cabbage and other vegetables for subsistence household production (Interviews with people from the settlements of DeDoorns East, and Sandhills, December 2014).

The water used for such small-scale subsistence gardening was supplied by the municipality through communal standpipes, which, in principle, were located within a 200m - 400m radius from a dwelling depending on the functionality of these communal taps. Some brick houses exist in DeDoorns East, which had a tap inside the house, and the same was true for Stofland, where the RDP houses in most cases had a tap inside the house. But for the settlements of Sandhills and Orchards, as well as the majority of DeDoorns East a tap in the backyard, communal taps or in the house were the sources of water⁴⁹. Boreholes were not affordable for any of the interviewed participants, thus groundwater was not abstracted by any of the research participants from the settlements.

In South Africa, a mixed tariff structure for water existed in 2016. Under a rights-based approach, twenty-five litres per capita per day were provided free of charge, so-called free basic water. After the delivery of this amount, the price for a cubic meter of water in the Hex Valley was 0.87 South

⁴⁸ This support program anticipates a relationship of collaboration between an established commercial farmer and black emerging farmers. For further information, see for example Saruchera 2007 and various publication of the PLAAS Institute of the University of Western Cape, <http://www.plaas.org.za/>.

⁴⁹ The official numbers from the municipal Breede Valley IDP of 2012 in this regard state that 93 % of the households would have access to flush toilets. I was not able to confirm this from my visits to the study area. The same was true for the kind of tap through which people got their water. The IDP stated that 82 % would have access to piped water inside the dwelling. This I have not seen in the settlements in the Hex River Valley. Please see the Appendix for further detail. Noteworthy, the Breede Valley IDP refers to the whole of the Breede Valley, not just the Hex Valley.

African Rand. However, the vast majority of the poor were unable to pay for the water supplied under this volumetric tariff and the municipality thus was unable to recover their costs. However, the municipality did not cut off the supply due to non-payments, but continued to provide water after the 25 litres per capita per day were used. With great frustration the municipal manager explained that municipal sources were already overused and not sufficient to supply the population without access to boreholes. The municipality had no other option than to buy water from the Hex Valley WUA for a price of 1.24 cent per cubic litre (CEO of HVWUA, April 2014, DeDoorns). I will return to analyse this finding in greater depth later in the Chapter.

However, the municipality was not able to recover the costs for the services they provided and was highly indebted (Senior water manager Breede Valley Municipality, September 2014, Worcester). For the poor, this tariff structure made subsistence gardening a costly enterprise. One participant of this study cultivated a vegetable garden of two square meters in the backyard of her RDP house. She lived by herself and used water only for sanitation, hygiene and cooking purposes and for watering her small garden. The amount of money she owed to the municipality had accumulated to over 14 400 Rand according to her water bill from the Breede Valley Municipality (pers. obs.). Considering her small monthly pension of around 1 350 Rand (135 AUD), she pointed out that she would never be able to pay her bills. She said (September 2014, Orchards):

I will never be able to pay for this. What must me do.[I have] no work, just my pension. It's 1 350 Rand for a month. And electricity, I must pay out of my pocket as well for the whole month. If I buy me 20 Rand [of prepaid electricity] it's for two days, and then finished, maybe 10 Rand. Water, oh god, it is a lot of money. I can't afford, my husband died two years ago. You see Jan, we are suffering a lot, a lot, a lot. Not like you. You see this aunty over here, she doesn't have a sink or what, and she must take water out of her toilet to cook herself some food.

However, in order to assess the situation in the Hex Valley in terms of water availability and water used per sector and water user group accurately, data on consumption patterns of the commercial irrigators would have been needed. This information however was almost impossible to obtain, as it was one of the best shrouded secrets during this research in both study areas. Further empirical light will be shed in this issue in the course of the following Chapters.

5.8 WATER CONSUMPTION OF THE COMMERCIAL IRRIGATION SECTOR

An evident lack of controlling and monitoring of water use by DWS and the CMA resulted in a lack of documentation. Neither the national DWS nor the regional CMA had any hydrological data on who was using how much water from which source in the Hex Valley (or were not willing to disclose such information). “No, we have no clue, who is using how much water”, said a Breede-Gouritz CMA’s senior water manager (September 2014, Worcester). This concentrated the crucial information about water availability, distribution infrastructure, actual water use in the hands of a few, the historically privileged agricultural elite.

However, apart from the consequences regarding asymmetric transparency and accountability skewed towards the group of commercial farmers, this also influenced the general research process. The geo-hydrological maps which I obtained directly from the DWS, only contained mere estimations about how much water is used from which source. For the amount of groundwater abstracted in the Hex Valley each year a map obtained at the headquarters of the DWS in Pretoria simply stated “above 10 million cbm”. Reliable data was either not disclosed and kept secret, or was not existent. None of the research participants of commercial farmers disclosed the information relating to their water quantities used per year for irrigation. This provided a large challenge to me as the principal researcher to determine the actual water use in the study area.

However, I was able to accumulate empirical evidence from the interviews with research participants of the three water user groups, with representatives of the national DWS, regional CMA and local WUA, as well as using official data from the DWS regarding dam capacities, combined with data from official production volumes for table grapes and the water requirements for table grape cultivation in the Hex. This allowed me to approximate the following empirical picture of water consumption in commercial irrigation sector (Appendix 7 shows three different ways of calculating possible benchmarks water consumption by the commercial farming sector in the Hex River Valley).

It is fair to say that 70 commercial farmers on combined 5 200 h in the Hex Valley produced 18 - 23 million cartons of table grapes each year used around 30 - 46 million cubic meters of water.

Contrasting this, the current water supply for the town of DeDoorns and the settlements amounted to 850 000 cbm annually. 250 000 cbm came from the Grootkloof diversion box abstracting mountain runoff; 400 000 cbm were bought by the municipality from the HVWUA and the Breede Valley Municipality had secured 200 000 cbm of water from the Osplaas dam. However, DeDoorns and the settlements had a current demand of 900 000 million cbm annually in 2013, of which the settlements used 310 000 cbm per year supplied to the inhabitants as water for human consumption to communal taps, backyard taps and in-house connections (IDP, Breede Valley Municipality 2012).

However, the municipal water manager explained not to have enough water to service the amount of people living in the Hex who depended on municipal services not having access to groundwater: the poor in the settlements and the emerging farmers. As such, the actual human demand was 1.15 million cbm per year, which meant a gap of 300 000 cbm. This was projected to increase to 1.5 million cbm per year by 2020 (Municipal Water Report 2010, printed copy obtained from the Breede Valley Municipality; Senior water manager Breede Valley Municipality, September 2014, Worcester).

For example, the emerging farmers on their farm of 11 hectares next to the WUA buildings (Emerging farmers EF 1-2, April 2014, DeDoorns) were given 11 000 cbm per year by the HVWUA sufficient for the irrigation of one to two hectares of table grapes. The emerging farmers working in the Utikyk project did not know how much water exactly they were receiving, but complained about a lack of water resulting in one third to a half depending on the time of season of their 48 hectares to be left fallowing. All emerging farmers explained not to have access to sufficient amounts of water and having no reserve for dry seasons with less rainfall. They had no guaranteed right to water, neither on paper, nor in practice, while the commercial irrigation used around 35 million cbm per year.

However, puzzling was the finding that the municipality had not have access to adequate amounts of water to service the inhabitants of the poor settlements and townspeople living in DeDoorns. Two thirds of the water supplied to them, the municipality bought from the HVWUA, despite the existence of three major dams, mountain runoff and ground water in the Hex Valley. More precisely, the municipality did assert control over sufficient water resources to supply the citizens living in their area of responsibility.

Why did the municipality not have access to sufficient amounts of water to supply their citizens adequately, despite millions of cubic meters of water in the three dams? And furthermore, why have the emerging farmers not have sufficient amounts of water for irrigating their crops?

Nevertheless, before answering these questions, it is necessary to complete the empirical story of the Hex Valley with another livelihood dimension, the socio-ecological one. It emphasizes the finding that the socioeconomic context, the ecological context and the livelihoods of thousands of people are strongly interconnected.

5.9 INTERCONNECTIONS

In the Hex River Valley, the large-scale groundwater abstractions of the commercial farming sector impacted the overall water availability in the Valley. The empirical evidence gathered through interviews with commercial farmers in the northern, southern and more central parts of the Valley painted a rather gloomy picture for the future of the Hex Valley's reliance on groundwater shaped by an ever increasing population in and around DeDoorns and a receding groundwater table due to overuse by the commercial irrigators. As a result, intrusions of saline groundwater occurred from the hydro-geological formations bordering the northern part of the Hex Valley where groundwater became increasingly brackish (Commercial farmers CF 2 and 4, April 2014, DeDoorns).

This relates to a rather external factor in the game of water access in the Hex Valley. As per participants, the international competitive economic pressure from Latin American grape producers in Brazil and Peru challenged the South African producers on European markets: the Peruvian table grape sector for example is subsidised by the Peruvian government in terms of water and electricity costs (Fernandez-Stark et al. 2016). According to participants, this would enable Latin American producers and exporting companies to offer grapes of larger size to lower prices on European markets than South African producers. These bigger varieties, however, became the preferred fruit of customers on the major export markets of the EU (Netherlands, United Kingdom and Germany) and the South African producers were under pressure to follow the trend of cultivating larger varieties (Commercial farmer CF D, April 2014, DeDoorns). "One third of the Hex Valley will be replanted for those bigger varieties within the next five years", explained one of the large commercial farmers in the Hex Valley mentioning that these larger varieties would also consume 30 % more water (ibid.).

The water consumption of the irrigation sector was thus highly likely to increase by 30% in the next five years. In addition to that, the population in the settlements grew rapidly in the last five years and was likely to continue to grow. Participants from commercial farmers, the WUA and the CMA all agreed that future demand could only be covered by abstracting even more ground water. The groundwater resources however, are already under pressure as explained above.

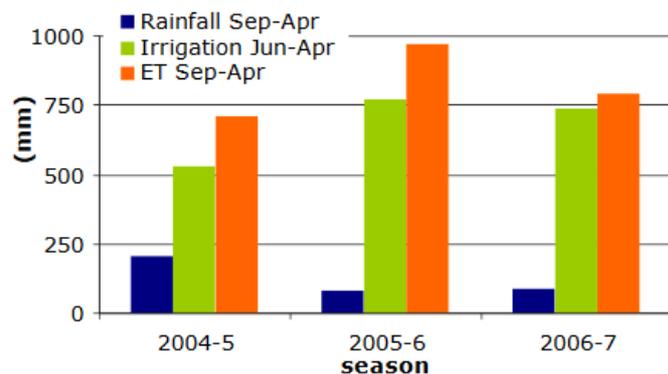


Figure 12: Average rainfall, irrigation and evapotranspiration (ET) in the Hex Valley⁵⁰

The figure above exemplifies the disjoint between available surface water from rainfall and water use for the irrigation sector in the Hex River Valley. The extensive use of groundwater was a direct result⁵¹. The most recent hydrological assessment accessible was done by the UMVOTO consulting company who calculated that abstraction rates were four times higher than the actual recharge rate:⁵² “The aquifer has been highly exploited” and “groundwater is being used four times the alluvial recharge rate” (Umvoto 2011, p. 9).

However, groundwater abstractions comprised mostly ELU⁵³ and the abstractions were generally not metered, although the WUA was in the process of installing metres for their members. Abstractions from the Hex River were also not metered. However, if metres were installed, controls did not take place regularly, if at all. The CEO of the HVWUA said: “So understand, it is impossible to manage the allocations from all those different sources without the capacity and the money to do so. And they [DWS] don’t have it” (CEO of HVWUA, April 2014, DeDoorns). A commercial farmer (CF 4, April 2014, DeDoorns) described it: “There are thousands of boreholes here, nobody knows exactly”.

Due to the lack of quantitative hydrogeological data on the rock formations under the Hex Valley, the qualitative data collected in the field serves as empirical indicator for the state of the groundwater use and suggests that the actual amount of groundwater abstracted in the Hex Valley for agricultural purposes was significantly higher than the 10 million cbm stated by the DWS in 2002.

⁵⁰ Variations are due to temporal variation of rainfall, higher temperatures in summer and lower temperatures in winter resulting in higher precipitation due to increased amount of snow and thus snowmelt in summer (WaterWatch 2010.)

⁵¹ However, by the time of this research there was no precise quantitative data of ground water abstractions and recharge rates available in form of official records from the DWS. This lack of data is partly due to the finding that water abstractions and use are shrouded in secrecy in the Hex.

⁵² Although the report of the Umvoto consulting company stated that, the report did not state the actual recharge rate.

⁵³ For boreholes drilled after 1998 the potential user is required to obtain a license from DWS. This license of course was granted for a certain amount. However, without any form of effective regulation, this was merely a paper exercise and most do not bother or have drilled their boreholes before 1998. All of the interviewed commercial farmers did so.

For example, the combined groundwater water abstractions of only the largest two major (in terms of agricultural output) grape farmers on combined approximately 250 hectares accounted for 1.8 million cbm per year. But in the Hex Valley a total area around 5 200 hectares are planted with table grapes with similar crop requirements in terms of water. Considering the number of 68 remaining farm owners cultivating table grapes in the Hex Valley, the actual groundwater use therefore can be estimated to be in between 16 million⁵⁴ and 30 million cbm annually. One of the participants said: "In the Hex we are using water that we actually don't have" (CF 4, April 2014, Worcester).

Based on the above findings, it is fair to say that the combined abstractions of the commercial farming sector in the Hex Valley caused the intrusion of saline groundwater into the groundwater reservoirs under the Hex Valley. This again jeopardised the water supply of the whole area, as the municipality depended on their boreholes for the supply of the poor settlements and the town of DeDoorns. Altering the course of the Hex River while bending it to serve irrigation purposes had resulted in erosion of the shoreline. The irrigation and precipitation run-off into the Hex River high in nutrient concentrations from extensive use of fertilizer on 5 200 hectares, caused the eutrophication of the Hex River further limiting the available water resources for human consumption.

5.10 SUMMARY

The poor people living in the settlements provided a cheap pool of labour for the 70 commercial farmers. The commercial farming sector generated annual revenue of around 200 - 300 million South African Rand. The financial earnings of participants from the group of commercial farmers ranged from each R 1 million to 16 million, while the poor people in the settlements earned the daily minimum wage in the country for low skilled farm labourers of R 105 (approximately 9.5 AUD). A limited number of around 200 people worked as a domestic worker on the farms, as a cleaner or performed another low skilled work (IDP, Breede Valley Municipality 2013). But for the great majority of people which lived in the settlements working as a seasonal farm worker for 5 months a year provided the only way to earn a salary and make a living. However, employment on the farms was only available for around 20 000 seasonal workers during the harvest season of five to four months from December until March/April. In the remaining six to seven months, the vast majority of 80 - 90 % of the black inhabitants of the Hex Valley was without any employment. During the harvest time, however, the jobs available could only provide labour for approximately 50% of the black and coloured population - the rest was unemployed and dependent on those who had a job.

The mass production of table grapes for the export to mainly European markets was the reason for the extensive overuse of ground water jeopardising the water supply situation in the Hex Valley as a whole. But it also provided thousands of low-skilled people with a form of employment, although the term employment suggests a form of formalised working relationship, which for the thousands of farm labourers in the Hex Valley did not exist. The frustration of the of people living in the settlements was a constant concern for the white commercial farmers, as it erupted frequently into

⁵⁴ This number is based on the earlier calculations. Please see Appendix 7.

social protests related to the working conditions on the farms, lack of work contracts, minimum wages and access to water and sanitation. In line with the findings described in the sections above it became evident that a lack of water and other municipal services, as well as the low wages for farm labourers unfit for a decent living, are thus at the root of the social protests in the settlements.

The emerging farmers described a lack of water as the largest obstacle to the success of their farming businesses, whereas the commercial farmers had multiple sources of water sufficient to irrigate their 5 200 hectares and to even increase their water consumption by 30 % for the larger grape varieties.

It was within this complex context, that the new institution of water governance, the Hex Valley WUA, was established in 2005. It amalgamated 5 Irrigation Boards (IBs), a white farmers organisation from the Apartheid, into one umbrella WUA. It thus 'contained' a large degree of history from these institutional predecessors of IBs. However, it was set up to improve the access of the poor to water stored for productive purposes, at least that is what the water policy reform of 1998 anticipated to achieve by the establishment of transparent, accountable, representative, inclusive and participatory and collaborative institutional platforms of CMAs and WUAs. The next chapter analyses whether this political vision had been transported into everyday benefits for those historically excluded from water for productive purposes. However, the previous sections already indicated that water access was still skewed towards the existing agricultural elites. The question, of why that is the case while investigating how this could happen, despite the new water institutions being established and operating will be answered in the following two subchapters.

5.2. OF RULES AND GAMES: TARPCO ANALYSIS OF THE HEX VALLEY WUA

This chapter presents an institutional analysis of the Hex Valley Water User Association (HVWUA) in the light of the established TARPCO criteria for analysing collaborative water governance. It answers the questions to which degree transparency, accountability, representation, participation and collaboration (TARPCO) were introduced by government actors and the three water user groups into daily practices of water governance processes within the HVWUA. Contrasting empirical findings from the ground with the political intentions of the water sector reform, this subchapter thus serves the purpose of achieving the objective three of this thesis, while preparing the ground for achieving objective four.

5.2.1 TRANSPARENCY - EXTERNAL

In order to participate meaningfully in an institution of water management, access to knowledge and information are central, for which again, education and literacy, i.e. the ability to read, write count and communicate, are crucial. However, this also goes together with being connected to other knowledgeable people and having adequate health in the first place (Goldin 2013; Sen 2009).

As emerging from the empirical data, it is likely that none of the research participants from the poor settlements in the Hex River Valley had knowledge about legal or institutional water governance structures in South Africa. The NWA 1998 was unknown; the Water Allocation Reform program was not known to them and they had never heard of a Catchment Management Agency (CMA) or a Water User Association (WUA). Participants expressed to possess no knowledge about Water Use Licenses and they were not aware of the fact that licenses from the Apartheid period were still valid in today's South Africa (Existing Lawful Use).

Accordingly, they had no or very little knowledge about the existence of the Hex Valley Water User Association (HVWUA), although the settlements were located across the major street (N1 highway), opposite from the offices of the WUA. Two out of 31 participants had seen the large sign stating 'Watergebruikersvereniging' (Afrikaans word for Water Users Association) that was located at the N1 highway⁵⁵ on the premises of the WUA, but had associated it with "the farmers". All research participants from the settlements were of the opinion that their water would come from the local municipality. Evidently, people from the settlements had no knowledge about the role of the WUA regarding water access in the Hex River Valley and the amount of water they controlled. It became clear that people from the settlements had no further knowledge about the South African water governance architecture. "A Water Association? I don't know about these things", replied a participant from the settlement of DeDoorns East (September 2014).

From the interviews, it emerged that none of the research participants from the settlements in the Hex Valley possessed knowledge about water resources availability and existence of three dams in

⁵⁵ Running through the Hex Valley the N1 highway became a large two-lane street.

the mountains. Knowledge about the existence of national, regional or local governance structures that govern water rights, use and management in the Hex Valley, let alone their roles and responsibilities regarding water for productive purposes was not existent.

Not surprisingly, though significant, the initiators of the establishment process of the HVWUA were the commercial farmers (CF 1, 2, 3 and 4). In terms of information sharing, the CEO of the HVWUA told me that they had advertised the commencement of the WUA establishment process in a local newspaper in Afrikaans and English language. They also would have “sent out letters to these people [the poor people in the settlements]”, but mostly would have informed them “by word of mouth” (CEO of HVWUA, September 2014, DeDoorns). However, it became apparent that this was to disguise a lack of public consultation: “Yes, we have send them [the poor people in the four settlements] a letter [of notification], but whether that letter gets to the right person in between all those shacks, that’s not my problem” said the President of the HVWUA, a commercial farmer himself involved in the WUA establishment process since the beginning in 2004 (Commercial farmer CF B, April 2014, DeDoorns).

Another participant, a small-scale commercial farmer⁵⁶, explained that information was crucial in the process of WUA establishment and operation: “You know, information about how a WUA works is not freely available for everybody. And in terms of the Act [NWA 1998], it is difficult to do redress if you don’t understand the mechanics. To proper redress, as the fair allocation of water, you need to understand the details” (Small-scale commercial farmer C-b, September 2014, Wolseley). He explained that the ability to access information and the knowledge of how to use it for one’s benefit would present a major comparative advantage of existing commercial farmers over the other water users in the Hex Valley, but also over the DWS and the CMA:

To protect the existing water user rights, which are unfortunately the big commercial businesses in our catchment, you need to know what is happening. You need to know about the actual water use and the existing allocations. That is the only way to operate within a WUA, for that you need the knowledge.

This statement relates to my findings of the limited knowledge at CMA and DWS about how much water was used by the commercial irrigators in the Hex. The political idea of the VandV reallocation policy was to determine the amount of ELU, locate over-allocations and then re-allocate the excess water for productive uses by the emerging farmers and the poor. This process had not been completed by the end of 2016 in the Hex Valley.

⁵⁶ This participant started as an emerging farmer in 2008. Due to his university education, his previous jobs in the meat industry and as a farm manager in the agricultural sector, he had extensive knowledge about managing businesses and large scale projects. He furthermore had strong professional contacts into the Breede-Gouritz CMA, on which’s management board he served as an advisor. In this function, he was also involved in the setting up of the Hex Valley WUA and the Ceres WUA. He was also an integral part of the Ceres WUA, neighbouring the Hex Valley. However, due to the geographical position of the catchments and sub-catchments little interaction occurs between emerging farmers of neighbouring catchments so far. Mainly this is due to a lack of transport or lack of money to pay for the local taxes.

However, a well-known South African researcher from the South African CSIR (Council of Scientific and Industrial Research) described this nexus of power asymmetries due to not sharing information and knowledge: “And what I am saying is that it is very easy for knowledgeable people, especially in a farming community, where everybody knows each other or is even related, to withhold certain information from outsiders. The white farmers have been doing that for years.” A former member of the Managing Board of Breede-Gouritz CMA (Small-scale commercial farmer C-b, September 2014 Wolseley) explained:

We have seen it with the consultants we contracted to gather information for us in the catchment and collect information from the users, which are the commercial farmers. That was an absolute nightmare: insufficient information and the lack of correctness and, you know, there was no reliable list of Existing Lawful Use and who uses how much water from which source.

One of the most senior managers from the regional CMA also mentioned that the availability of knowledge and information is essential and explained the consequences of asymmetrical distribution of information among actors for processes of water governance:

You are likely to encourage water tokenism, where a certain group of people dominates, which, because of their knowledge and education is more vocal than the other group. So in order for you to reach a state of equality, you need to ensure that those who have previously ‘slept below’, you invest in them (...), so that when it comes to participation they all operate on an equal level. The other thing is that the level of transparency becomes bigger and the level of interest in managing that resource becomes encouraged .

This statement clearly described four aspects: first, the importance of information for being ‘vocal’, i.e. to make one’s voice heard in amongst other voices. Second, he asserted the human capability of knowledge and education as crucial to the possibility of reaching ‘a state of equality’. Third, and implied in the previous sentence that currently a ‘state of equality’ did not exist. Fourth, the participant highlighted that access to information was a precondition of transparency, which, in turn, was a prerequisite for participation.

External transparency about the existence and functioning of a WUA was limited in the processes described above. Knowledge about the national legislation and its normative goals concerning water access rights and historical entitlements, about the existence of a CMA and about water resources available in the catchment was given for commercial farmers, but was limited for emerging farmers and lacking for the poor from the settlements.

5.2.2 TRANSPARENCY - INTERNAL

Apparent from the empirical evidence was an uneven endowment of information and knowledge between emerging farmers and commercial farmers about how a WUA operates in practice. The commercial farmers had started the establishment process, were full members of the MANCO or had sent nominated representatives. All of the commercial farmers interviewed had substantial knowledge about the sections of the NWA 1998 that applied to WUAs and about the WUA Constitution as a set of rules for WUA operation, whereas the five emerging farmers had no knowledge about either.

However, they were aware of the existence of the WUA and two of the five interviewed emerging farmers had heard the commercial farmers speak about a Constitution, but they had no knowledge about its content and their expressed frustration about that nobody had explained it to them. On the one hand, they were neither given this information by the CEO, the president or the vice president of the WUA, nor had any government official explained the workings of the WUA to them; on the other hand they had never asked for it. However, they felt not entitled to it, because they perceived the WUA to be an association of the commercial farmers (Emerging farmers EFs 1-4, September, December 2014, DeDoorns). All the emerging farmers were deeply reluctant to demand anything from the commercial farmers. They perceived the water they were receiving from the commercial farmers, as kind of a favour, not as a right stemming from the NWA 1998 (ibid.). Furthermore, all emerging farmers classified the WUA as a 'private organisation' of farmers in the Hex Valley that was affiliated with the 'boards'.

All of the emerging farmers I interviewed had heard about the NWA 1998, but could not specify what this piece of legislation meant for them in practice (Emerging farmers EFs 1-5, April, September, December 2014, DeDoorns). They did not know what this institution was set up to improve their livelihoods; the government's Water Allocation Reform was unknown. They possessed no knowledge about general water availability in the Hex, how water much was stored in the three major dams and which farmer would get which quantity on which legal basis. As such, legal arrangements of Water Use Licences of Existing Lawful Use were unknown to any of the emerging farmers interviewed in this study.

None of the participants of emerging farmers was aware about their rights as a (potential) member⁵⁷ of the WUA and they expressed to have no knowledge about certain rights and responsibilities specified in a written agreement. This applies to the right to be represented on the MANCO, but it also applies to knowledge about voting rights and voting procedures for example. Furthermore, the roles and responsibilities of members were not known to them; the procedures and underlying rules for decision-making - for example regarding representation and voting rights or for water distribution and regarding payments - were unknown to any of the emerging farmers.

⁵⁷ Three seats on the MANCO were reserved for them and listed in the Constitution, but never filled in reality. Please see section 5.2.4 for more detailed accounts of this.

Furthermore, they were unaware of the legal fact that the amount of water used in between the period of 1996-1998 was considered as Schedule 4 water use (Existing Lawful Use) under the current legislation. In effect, this meant that the amount of water used pre-1994 during the Apartheid (or more, as some farmers expanded in between 1994 and 1996) was considered lawful until today.

This is partly the result of a failure of the South African government to implement the water policy. A senior manager from the South African Association of Water User Associations (SAAFWUA), who has worked with the DWS for more than ten years before becoming the CEO of a WUA near the Orange River (President of SAAFWUA, CEO of Orange Rieet WUA, February 2015, Johannesburg) commented on this issue:

Information exchange and communication is essential for water management cooperation in between WUAs and CMA, but also between the users. Currently such system is not in place. The Departments information system is not existent, they rather less than more do their job, but do not communicate properly.

The CMA and the DWS had no hard data on which user used how much water from which source. “No, we don’t have a clue on how much water is there, how much is used”, said a senior manager at the CMA (CMA-1, April 2014, Worcester). This had further implications in terms of re-allocating potential over-allocations of commercial farmers of Existing Lawful Use. This meant that information about how much water for productive purposes was used under Schedule 4 of ELU by the commercial sector, was not known to the Breede-Gouritz CMA or even the Department of Water and Sanitation. It was evident that this was a well-protected secret by commercial farmers to avoid possible re-allocation.

Another finding of non-transparency was revealed when two emerging farmers explained to me that the 12 hectares of land, was bought for them by the WUA and that this purchase had also been financed through a loan from the WUA. As a single fact without putting it into context, this was of course of positive development, as the two emerging farmers themselves confirmed (Emerging farmer EF 1, April 2014, DeDoorns). But how this purchase has happened in detail, they did not know. However, as I learned during my second and third visit in the study area, this created a socioeconomic dependency of the emerging farmers on the WUA and the commercial farmers. None of the emerging farmers had any legal documents about water use entitlements or had any knowledge about water entitlements attached to their land from the two major storage dams. They also had no knowledge about any water use licenses, neither, whether they had licenses of their own or those of their fellow WUA members (Emerging farmers EFs 2 - 4, September 2014, DeDoorns).

It became apparent that commercial farmers did not disseminate information to their supposedly fellow members of the WUA. The emerging farmers explained not to be part of any information exchange about water related activities. The Sandrift irrigation system consisting of the two storage dams in the mountains and the Osplaas dam, rather old irrigation canals from the 1970s and 80s and the underground pipeline system was operated by the CEO of the WUA. He alone controlled the opening and closing of weirs, sluices and controlled the amount of water let through to the property of each user. He had “quite good knowledge about our [the commercial farmers] water here” (CEO

of HVWUA, April 2014, DeDoorns). In fact, operating one computer program in the WUA offices, he digitally controlled the whole techno-hydrological reticulation system from the dam outlet to the last weir at the private property boundary of the water user. However, information about the amount of water that ran through this system was available to commercial farmers only.

Participants of the group of emerging farmers furthermore explained that their access to irrigation water would be realised only through the commercial farmers: "They [the commercial farmers] will tell us when we will get the water" (Emerging farmer EF 2, April 2014, DeDoorns). The practice of collectively sharing information about water availability and distribution, water development and planning was not existent within the HVWUA. The emerging farmers explained that the fact that they had to wait until the commercial farmers would tell them that water would be available, would seriously inhibit their abilities to plan ahead their farming activities and thus also impact on their families livelihoods.

Commercial farmers in the HVWUA (and the CEO) held a monopoly of hydro-technical information. They were thus holding the key to a possible reallocation of water for productive purposes: the availability of information was the precondition for implementing the national policy of Water Allocation Reform (WAR). The major idea and also practical means of achieving a 'radical shift' in the ways that water for agricultural purposes was allocated (NWRS 2), was to assess the amount of water used under ELU by large-scale user and to reallocate detected over-allocations to the poor majority irrigation farmers. This was also stipulated in the current water legislation (NWA 1998; NWRS2; NWPR 2013). But without knowledge of who uses how much, a re-allocation was not possible. To enable this re-allocation the Minister of Water and Sanitation could have demanded this piece of information from the WUA, as by law, they are part of the government structure. This, however, had never happened.

Besides controlling the irrigation water, the WUA in the Hex Valley had also taken up the role of an intermediary water service provider (WSP). As such the HVWUA sold treated water to the municipality, who again, sold it to the people living in the Hex Valley. This was with two exceptions. The first is that the group of commercial farmers, who ensured their own drinking water supply, as they, without exception, had other means of accessing water: they either had access to groundwater sources of drinkable quality through private boreholes or they had access to mountain runoff. The other exception were the approximately 4 000 people living in the Sandhills settlement, because they were supplied with raw and untreated water by the HVWUA (into the five storage tanks displayed earlier in this Chapter).

The HVWUA supplied the settlements of Sandhills with water pumped through a pipeline into open reservoirs, which made the people living in the settlements an interested party in the game of water governance in the Hex Valley. The research participants living in Sandhills had, however, no knowledge about this circumstance, but believed the water would come from the municipality, because the water bills they received came from the Breede Valley municipality as part of the Western Cape Provincial government structures. However, the significant finding is rather the fact that the WUA did not supply Sandhills with water complying with South African drinking water standards, but with untreated, raw water. The water was of "fairly good quality" as the senior municipal bulk water manager confirmed (September 2014, Worcester), but it was not treated in the

local water treatment plant. Moreover, the reservoir held only water for a couple of days. The CEO of the HVWUA (April 2014, Worcester) stated: “They now have communal taps. So we supply the water to the property and from there it is the owners business to distribute the water. We don’t distribute it to every shack. And we don’t supply drinking water. So they drink it on their own risk. Our constitution does not say that we supply drinking water.”

He continued to explain this scenario further:

That is the informal settlement [of Sandhills]. There is the 5 small reservoirs. That property belongs to the Dept. of Public Works, these people live there in squatter camps. The Dept. of Public Works [Western Cape provincial government] pays us for the water, but that’s in Cape Town. We have a great concern, when we do maintenance on our pipelines we cut off the water to there and they don’t have enough storage. The Dept. was actually surprised how much people live there now. The price is R 1.24 per thousand litres. Per year they have an allocation of 42 000 cbm, so it’s about R 50 000 that they pay us per year. But they are over - abstracting now, they go around 70 000 now. And it also puts a lot of pressure on ELU. Because where is the water coming from?

Three aspects of these statements are of importance here: first, the WUA supplied untreated water to one of the informal settlements at a cost of R 1.20 per cubic meter paid by the Dept. of Public Works of the Western Cape Province. Second, the current allocation was not sufficient to meet the water needs of the inhabitants of Sandhills and the users were over-abstracting, which meant that there was a certain amount of water available somewhere. Third, and most importantly, the people in Sandhills used water above their 42 000 cbm which would put pressure on water use under the Schedule 4 license of Existing Lawful Use (ELU). Combined, these pieces of information meant that unused ELU-water was either stored somewhere; or the over-abstractions of Sandhills were pumped from boreholes operating under Schedule 4 of ELU. The latte was not possible as the water was supplied via the pipelines of the Sandrift irrigation scheme, to which boreholes were not connected (CEO of HVWUA, April 2014 DeDoorns). So, at this stage of the research an important question surfaced: where did this water come from? Where did the ‘buffer’ of 18 000 cbm came from, which the people in Sandhills were allowed to use beyond their allocation? The answer came in form of the Osplaas dam, which the WUA had built in 2007 and used to store their Existing Lawful Use. This, however, will be critically analysed in the later sections of ‘the story of the Osplaas dam’.

Nevertheless, regarding knowledge and transparency, all the participants from the group of commercial farmers⁵⁸, were involved in the establishment of the WUA from the beginning of the process in 1999. Commercial farmers who took part in this study were familiar with the procedures and rules regarding WUA operation. All of the commercial farmers who participated in this study were aware of the WUA Constitution as a set of rules influencing WUA operations and internal processes. Knowledge about the NWA 1998 Act and even detailed knowledge about specific sections

⁵⁸ This is except one commercial farmer, who had never been part of the WUA.

relating to IBs, WUAs and Existing Lawful Use were prevalent among commercial farmers. They knew that the WUA was the local water institution responsible for water governance on the local level; they all knew the senior water resource managers at the CMA by name.

On the one hand, the rules for decision-making processes, the rules underlying the allocation of voting rights and the practical distribution of water through the network of underground pipelines were known to all commercial farmers. They furthermore had sound knowledge about the hydro-geological characteristics of the Hex Valley; about water availability, storage and distribution network and also about composition of the water tariff.

On the other hand, internal transparency was limited for the emerging farmers, which expressed not to be included into information sharing among commercial farmers. They also explained to have been excluded in the process of developing the HVWUA establishment proposal and thus from developing its Constitution. This will be further analysed in the following sections.

5.2.3 ACCOUNTABILITY AND CONTROL

One component of accountability relates to the existence and efficacy of external bodies of control which monitor the activities of WUAs and their outcomes (Carloni and Crowley 2005).

Regarding the monitoring of WUA establishment and operation by external organisations of civil society, I have not found evidence that would have shown the existence of an influential watchdog organisation. In general, genuine South African civil society organisations that focus on socio-political issues in South Africa do not present a strong and prominent societal voice in South Africa's water sector (Interview senior researcher CSIR, June 2015, Pretoria; Interview Consultancy, November 2014, Worcester).

During this research interviews participants from the DWS, the WUA and the University of Cape Town voiced their perception that the CMA had to take up the role of a monitoring and controlling authority, overseeing the activities of the WUAs in there are of responsibility (Deputy Director for institutional governance at DWS, January 2014, Pretoria; Small-scale commercial farmer, member of Ceres WUA, September 2014, Wolseley; Interview senior researcher UCT (University of Cape Town, December 2014). This was also stipulated by the NWA 1998. However, the Breede-Gouritz CMA had no interest in taking up a monitoring role and also had limited capacity to do so.⁵⁹ The senior manager at Breede-Gouritz CMA, section of institutional and stakeholder engagement clarified: "So we don't control them or anything. We let them do their job" (CMA-3, September 2014, Worcester) although one of the CMAs functions is the coordination and control of the other water institutions. However, the DWS is also supposed to play an oversight and monitoring role (NWA 1998). Unclear institutional roles and responsibilities constantly caused confusion among senior managers of the CMA of how to act. Moreover, research interviews revealed that the CMA to a large degree depends on the operations of the HVWUA: "If the WUAs wouldn't do the water management, then the CMA must put resources in place to do it. It would be a tremendous challenge."

The senior manager at Breede-Gouritz CMA, Dept. of institutional and stakeholder engagement said: "(...) without the WUAs we wouldn't be able to function. (...) everything we do, we do together with WUAs. I mean most of our projects we do together with WUAs. We also do regulation and oversight and are the instance of control and every quarter we report to the national Department" (CMA-3, April 2014). However, these reports merely state issues of water management in a general manner and do not present a statement on the WUA operation or the outcomes. Enquiring about this further the same senior manager said: "Aahm, look, what we report is general on what we are supposed to deliver. But we don't go into detail, so that we went to that meeting or whatnot. We report on the main aspects of the business plan." Asked to clarify that with regards to control and oversight role of the CMA concerning decisions made at WUA level, the same manager answered: "I mean, look, we don't really influence that level. It will be amongst the farmers; we eventually might go to a meeting, but we will not have influence on a decision that will be made with regards to that. They know how to do their stuff and what is best for their people."

⁵⁹ Capacity in this thesis is defined as the ability to use one's resources and capabilities to achieve a desired outcome.

This revealed that between the CMA and the WUA a relationship of accountability and control in terms of water governance was not existent. The CMA had no influence on the operations of the WUA. But it furthermore strongly showed that an the old agricultural elite of commercial farmers made the decisions 'for their people'. The same manager continued to indicate which group that refers to: "Well yes, obviously the farmers, the commercial farmers."

Moreover, the CMA and the WUA had a common goal: to protect the vested interests of the commercial irrigators and to secure water for commercial irrigation purposes. The most senior water resource manager from the Breede-Gouritz CMA commented (April 2014, Worcester): "So, most of the WUAs and IBs is dominated by farmers, the irrigation users. They should, because they use 94 % of the water. This is an agricultural area." It became apparent that the transformation of water access and control towards improved access of those previously excluded, was not the priority of the CMA. Similarly, the CEO of the WUA saw such transformation as an obstacle (April 2014, DeDoorns) to their business and the interviewed commercial farmers saw it even more critical demonstrating mind-sets from the past (see also Kemerink et al. 2013). "Transformation is the new Apartheid", said one of the CFs involved in the WUA since the beginning of the establishment process in 2000s. The vice president of the WUA, who knew the senior CMA's water resource manager well "from his time at water affairs [the DWS]", formulated more explicitly: "The CMA is irrigation based, you say? Yes, that is their whole purpose. You know in the Hex Valley we generate close to a 200 million Rand in just one year. So, I think the CMA knows what is good for them and who their clients are. They know this."

However, a reporting mechanism of oversight for the national level to control the operations of the WUA was provided in the NWA - the Business Plan. Every WUA in South Africa was supposed to develop a Business Plan and submit it to the DWS within the first six months after their establishment (NWA 1998, Schedule 4, Section 79). The WUA must act according to the rules stipulated in this document and the minister can demand explanations and additional information regarding any aspect of the operation of the WUA and issue directives the WUA has to comply with (NWA 1998, Schedule 4, Section 70). This includes financial and accounting issues; representivity on the MANCO; decision-making procedures and water allocations. However, a Business Plan was not in place for the HVWUA, in fact, none of the around 30 WUAs established in the Western Cape Province had ever submitted a business plan (CMA-3, April 2014, Worcester). "You know that they are supposed to have a business plan; actually the act [NWA 1998] says that within six months after transformation of IB to WUA they must have one, but that never happened with a single one of the WUAs" (CMA-1, April 2014, Worcester). The CEO of the WUA (HVWUA, April 2014, DeDoorns) explained the working relations and degree of collaboration between national and local level with the following words: "Water Affairs has never been here in my office, never since 2002. They never wanted a report or anything. We are operating on our own here. Water Affairs plays no role here."

In the absence of national oversight by the DWS or the regional CMA, the CEO of the HVWUA became the pivot of water access and physical control. From his office, he controlled the release and distribution of the water stored in the three dams. He released water from Lakenvallei, Roode Elsberg and Osplaas dam and opened the sluices and weirs. However, apart from controlling the physical flow of water to the commercial irrigators, the CEO influenced the voting processes of the

MANCO. The HVWUA vice president explained: “And the CEO is a secretary; he doesn’t have a vote. But he can swing the vote through his lobbying. Because he will pose the issue and set the agenda and everybody comes to him. He can be very influential, because he sits with all the [Irrigation] Boards and has all the information.” This shows that the CEO occupied a potentially powerful role. He set the agenda for the meetings and sent out invites via email to the irrigators.⁶⁰ He controlled the amount of water released to each user and stopped the release if the allocation quota was exceeded. The CEO also clearly indicated to which group of water users his loyalty belonged to: “I work for the farmers, they pay my salary. They are my family.”

As all other interviewed commercial farmers, the CEO was convinced that the WUA would be a private institution. Similarly, and displaying a limited understanding of the NWA 1998, senior managers of the Breede-Gouritz CMA also expressed their view that the WUA would be a private business. The manager responsible for institutional and stakeholder engagement said: “A WUA is a business. It is business-oriented, it’s private. I do not think it’s state-steered” (CMA-3, April 2014, Worcester). This shows that neither CMA nor DWS controlled or monitored the operations of the HVWUA. This meant a non-existent external accountability of the WUA to the DWS. Despite the yearly reports containing mainly the budget that the WUA had to send to DWS, there was no contact between WUA and DWS.

Notwithstanding, CMA and WUA were collaborating effectively in terms of water management. However, their efforts were targeted towards supporting the existing interests of the commercial irrigators preserving their privileged water access, instead of improving water access for the black majority of the local population.

In the following sections, I will further analyse which practical value the constitutional rules from the NWA 1998 and regulative rules of the NWRS 2 had, especially regarding the development of the WUA Constitution concerning representation and participation of emerging farmers and the poor in everyday WUA operations, and if or how collaboration between water users had taken place.

⁶⁰ The analysis of the livelihood context of emerging farmers showed that they had only limited internet access and possessed limited or no knowledge how to use this technology (Emerging farmers EFs 1-4, April, September 2015, DeDoorns). This severely inhibited their ability to participate.

5.2.4 REPRESENTATION, MEMBERSHIP AND PARTICIPATION: WHOSE AGENDA IS IT?

To be represented and to participate in decision-making regarding water is an essential ingredient for democratic water governance institutions (UNDP 2006). They are also a central component of the South African water governance approach and an explicit criterion for WUA operation (NWA 1998; NWRS 2).

The statements of commercial farmers as members of the HVWUA, but also from staff at the CMA imply a participatory decision-making in an environment that would be representative and collaborative. The WUA from their perspective was a platform “where everybody has their say” representative of “kind of everybody who uses water” (President of the HVWUA, April 2014 DeDoorns).

However, a Deputy Director in the Department of Water and Sanitation for the section of institutional governance (DWS, January 2014, Pretoria) painted a largely different picture of the performance of WUAs:

Stakeholder involvement is to get the local guys involved and working together in water resources management at that level. But I think one of the major reasons why there is WUAs just doing things somehow [instead of being representative], is regulation. How do you regulate them? Because the current way I think it is not working, but I am not sure why.

This was a statement from a high-ranking official from the Department of Water and Sanitation, who was specifically tasked with matters of institutional governance and directly reported to the Minister. He was complaining to me during this research interview about the situation of WUAs, but not offering a solution or a strategy to overcome the issues of regulation, representation and participation, water access and also transformation of water access for productive purposes towards improved livelihoods. Using the Business Plan as means of oversight and control, or using any other of the Minister’s or the DWS’ power to issue directives the WUA would have to comply with, seemed to be of no interest to DWS representatives.

However, the interesting question of the TARPCO framework was, in which ways were commercial farmers, emerging farmers and the poor people living in the settlements represented in decision-making processes in the Hex Valley WUA? The empirical answer is: the commercial farmers dominated the MANCO and were always in the majority; emerging farmers and poor people from the settlements were not represented, except for approximately every three months through the municipal manager for bulk water from the Breede Valley Municipality. The HVWUA constitution however stated that they had three seats on the MANCO. However, the constitution was a ten-year-old document, which was not illustrative of current members and the three seats had never been filled.

Within the CMA different perceptions existed of what a WUA is in terms of the Act and what it is in reality. A senior manager from the Breede-Gouritz CMA (April 2014, Worcester) said:

I would define them [the WUAs in South Africa] as one of the water resource management institutions. But for me it's more like a common interest group, although in terms of the Act it supposed to be diversified. I have seen some areas where WUAs cooperate well with emerging farmers. I have not really seen it in action in our area.

The Constitution of the HVWUA stated that the “founding members” of the WUA, the commercial farmers, have the power to prepare the voters roll for the first election. From a theoretical perspective, this means that commercial farmers had the power to set the circumstances in which others have to act. Preparing the list of people who would be electable can exclude or include someone at the will of the commercial farmers. In the absence of any effective monitoring and control mechanisms, the process of determining who can be voted in elections for the WUA Managing Board for was prone to manipulations. “What I have seen was that the drivers of the process of the WUA will manipulate the nomination process nominating someone that does not represent a certain constituency”, explained a former member of the CMA and member of a WUA from a neighbouring catchment.

Concerning the WUA establishment process, he commented:

You see the process of establishing a CMA, the Breede-Overberg CMA, is totally different from the process of establishing a WUA. The WUA establishment, it is a cold, clinical paper exercise. There will be an advert in the local newspaper, which is in Afrikaans, maybe that advert is in English, but I have seen it not being in a black language. With the CMA establishment it was a prerequisite that at least three languages are used. There were translators in the meetings. There were prior workshops, to make sure that individuals that were not really educated could understand all the technical stuff ... there were pre-meetings in local areas, where stakeholders with a previously disadvantaged background were explained what will be happening at the next bigger CMA meeting. Because with the establishment process of Breede-Overberg CMA the attendance of people actually grew, because of the quality of facilitation process, while with the WUA establishment, the last one that I have attended only 30 % of the target group pitch up for the most important meetings.

So I would say, being part of the Breede-Overberg CMA establishment process, having seen the quality of the meetings ... walking the extra mile ... paying for the transport of people to come, accommodation being arranged and small grants being people paid and speaking to the people afterwards.... but at a WUA meeting, it's like ...'if they do not attend, it's not my problem'.

The DWS had invested human and financial resources for the CMA establishment process. But for establishment of the WUA, which had, opposite to the CMA, physical control over millions of cubic meters of water and with it a larger and more direct impact on the livelihoods of local people, this

process was left to the commercial farmers. This was although the WUA establishment guidelines explicitly state the degree of facilitation by DWS had to be determined by the degree of knowledge and engagement of those historically marginalized and exploited. As they had no knowledge about water governance institutions, the DWS should have facilitated, built capacity, and explained to local people what a WUA was and what its mandate was supposed to deliver in terms of redressing the wrongs of the past.

Not surprisingly, an influential group of commercial farmers used this 'room to manoeuvre' to influence the establishment processes in their favour. Two senior managers from a South African Consultancy (November 2014, Worcester), who were mandated by the DWS to undertake IWRM capacity building in the Hex Valley during the WUA establishment in 2005 also commented on the process of participation: "I saw some of them just collecting the ID numbers, but not doing participation. There is a lot of corruption happening. They paid them and got their IDs." The ID numbers were those that appeared on the voters list, which was, as per HVWUA Constitution (section 15.1), prepared by an individual appointed by the founding members of the WUA. The founding members were exclusively made up of the agricultural elite - the commercial farmers. As such, the HVWUA Constitution reported the following composition of the MANCO for the time of the WUA establishment in 2007:

Table 6: Composition of the MANCO of the Hex Valley Water User Association (as per Constitution)

Water Users/Seats on HVWUA MANCO	Com. farmers	HDIs	Women	Others
Hex Valley sub-district	4	0	0	
Matroosberg sub-district	1	0	0	
Bovenstewater sub-district	1	0	0	
Three Rivers sub-district	1	0	0	
Individual users	-	3	0	
Local Authorities	-	-	0	1
Small Farmers	-	3	0	
Neighbouring WUA	1	-	-	

However, inquiring this further, I found that the composition of the MANCO was not the result of a voting process. The commercial farmers had formulated the HVWUA Constitution to serve their interests. The relevant passage (section 7.2) in the Constitution shows this: "The current members of the Hexvalley, Matroosberg, Groothoek, Bovenstewater and Three Rivers irrigation boards and are therefore automatically considered members of the association (...) and any person who has a lawful water usage entitlement within the operation area of the association and whose written application for membership has been approved by the managing committee." Membership had thus automatically been granted to the historically privileged white farmers.

On the power of the 'founding members of the WUA' to prepare the first voters list for Management Committee of the WUA, the small-scale commercial farmer and member of the neighbouring Ceres WUA commented (September 2014, Wolseley):

There is a nomination process for members of WUAs. So what often happens and I have seen it in the Hex, is that the nominations will come from the organising structures, but the nomination lists lack the names of the people in poor townships or small scale farmers and small scale water users. What I have seen in one instance was that the drivers of the process,

which is the big farmers of the WUA, will manipulate the nomination process nominating someone that does not represent a certain constituency.

The municipal water manager explained (Senior water manager Breede Valley Municipality, September 2014, Worcester): “There is a tendency in the establishment of WUAs and then in their operation to protect the existing water rights, which are unfortunately the big commercial businesses in our catchment.”

The reason for this a key participant of this research (Small-scale commercial farmer, member of Ceres WUA, September 2014, Wolseley) saw in the asymmetries of resources and capabilities that he perceived to be the pre-requisite for representation and participation: “So the quality of the human element behind these processes is the big difference. I have been involved with the establishment of two WUAs in the Ceres area and the one in DeDoorns and you need the capacities to actively participate and even to be represented.”

5.2.5 COLLABORATION IN DECISION-MAKING PROCESSES: WORKING TOGETHER?

Working together in decision-making over water related activities for mutual benefits was the goal of WUAs specified in the South African National Water Act 1998. Collaboration in that sense was essential for water governance on a local level at which different users supposedly debate and negotiate water access (Pollard and du Toit 2008; Saravanan 2010; Goldin 2013).

On paper, decisions on the MANCO were made through a majority voting system. However, the composition of the MANCO allowed commercial farmers to always constitute the majority. The influence of members on formal voting procedures depended on the weight of their vote, or, even more, whether they were entitled to vote in the first place.

The Constitution of the HVWUA allocated voting rights⁶¹ on the basis of one vote per five hectare of land under irrigation provided to members holding a valid water license. However, no member was allowed to hold more than 10 votes. Now, each of the seven commercial farmers of the sub-districts represented on the MANCO owned more than 30 hectares (Commercial farmers CFs 1, 2, 3, April 2014, DeDoorns), whereas the individual users and the small farmers by the time of the establishment of the WUA owned no land and had no formal water entitlement. Today, the emerging farmers owned a combined number of approximately 45 hectares, but, according to participants, they did not hold a formal water entitlement. Instead, they were ‘given’ water by the

⁶¹ The Hex Valley WUA constitution stated: “The amount of votes that a member is entitled to is determined on the basis of one vote for every 5 (five) hectares or a portion of 5 (five) hectare of land which, empowered by the member’s entitlement to water use, can be irrigated provided that, to no member, more than ten votes may be awarded within a specified sub-district. The amount of votes to which a member is entitled, for sub-districts where water usage is determined by volume, is determined on the basis of one vote for every 37 500 meter cubed or portion of every 37 500 meter cubed, empowered by the member’s entitlement to water use, provided that, to no member, more than ten votes may be awarded within a specified sub-district” (Section 15.3 of the HVWUA constitution).

commercial farmers in an informal process (Emerging farmers EFs 1,2,3,4, April 2014, DeDoorns). The 'individual users' mentioned in the HVWUA constitution⁶² did not own land by the time this research was conducted. Subsequently, they had no vote. In fact, I could not find any evidence that they even existed⁶³ and the emerging farmers had no knowledge about any farm workers that had ever been part of the WUA or any of the meetings (Emerging farmer EFs 1-2, April 2014, DeDoorns).

This means in the case of a formal voting for an issue regarding water related activities, the commercial farmers had a combined number of 70 votes, as opposed to 30 votes of emerging farmers. Whoever the individual users were, they had no voting rights. As I have shown in the first sections of this Chapter, this does not represent the demographic realities in the Hex Valley, as envisaged by the NWPR 2013. Nevertheless, this distribution of voting rights also meant that if the municipality - as the democratically elected representative body of the poor people living in the settlements - was participating in a meeting at which a voting took place, its representative had no right to cast a vote.

In addition, the HVWUA Constitution provided for the opportunity to further curtail the voting rights of members. It states in section 13.12: "All member of the management committee will be able to fully participate in decisions made out after management and the financing thereof. (...) The chairperson of the management committee will decide whether or not a member has voting rights of specified issues." This revealed that the chairperson had the power to delegate and evoke voting rights of WUA members at his own will. The chairperson was elected by the majority vote of the members.

Asked whether the thousands of poor people living the settlements or the emerging farmers were represented on the decision-making boards of the so called sub-districts under the HVWUA, the president of the WUA answered (HVWUA D2, April 2014, DeDoorns): "No, that's what the WUA is there for, to put them there, not with our Boards." The WUA obviously served the purpose of appearing to be inclusive of the black emerging farmers, whereas the 'boards' (re-labelled as sub-districts of the WUA) remained the actual platform for the important decisions regarding water access. It was apparent that the commercial farmers involved in the WUA saw the WUA as an institutional mechanism to take control of the water resources and to institutionalise their 'business-as-usual' in the IBs. They were highjacking the WUA, due to their own legal expertise and knowledge, while the absence of state control offered them the room to do so.

They also kept information that might be leveraged against them shrouded in secrecy, especially information regarding the amount of water used under the ELU license, in order to prevent a possible re-allocation. In line with that is another research finding: members of the WUA actually

⁶² The term 'individual users' referred to farm workers, which had lived on the premises of the commercial farmer (CEO HVWUA, D1, April 2014, DeDoorns).

⁶³ The CEO of the WUA said that "at least one of them have left the Valley" (CEO HVWUA, D1, April 2014, DeDoorns). He was not able to provide any contact information for the two remaining in order to conduct a research interview, or was not willing to disclose such information.

never voted at all during a MANCO meeting (if such meetings in effect took place). The decisions were made during the informal meetings between CEO of the WUA, the IBs and their chairpersons managing boards and the president and vice-president of the WUA. The vice-president (HVWUA D3, April 2014, DeDoorns) of the HVWUA explained: “We don’t really go to vote though, not really. So should it come to a vote, commercial farming sector will always have the majority. “

However, this needs to be put into context: a research interview in September 2014 with two emerging farmers took place in the mechanical workshop located in the backyard of the WUA. All of the participants from the group of emerging farmers were employed by the WUA on a part-time basis. They were employed in the mechanical workshop to maintain the commercial farmers farming equipment and for operation and maintenance purposes, for example inspecting and maintaining the few remaining open canals and sluices or other parts of the irrigation system (Emerging farmers EFs 1 - 5, April, September, December 2014, DeDoorns). All of the interviewed emerging farmers were also working as farm labourers on one of the properties of the same commercial farmers organised in the IBs and the HVWUA MANCO. However, parallel to this research interview with emerging farmers a large meeting took place in the WUA offices, the size of which was visible from the amount of SUVs and pick-up trucks standing in front of the WUA building that belonged to the commercial farmers from the IBs. The emerging farmers explained that such meetings would happen regularly, but that they would not be invited (EFs 1 and 4, April, December 2014, DeDoorns). “No, we are not invited. Maybe this will change on day when we sit on the Board [the MANCO]”, said one of the EFs. Obviously, the emerging farmers were not part of the MANCO in practice. The CEO of the HVWUA had explained in 2014 that the emerging farmers would be represented by the vice-president during the meetings with IBs and also in the rare case of MANCO meetings. However, the emerging farmers (Emerging farmers EFs 3,4, September, December 2014, DeDoorns) explained that the person supposedly giving them a voice and representing their interests “has not spoken to us” and that they had “not elected him” in the first place. The only time when the emerging farmers in the Hex Valley were directly represented in person in meetings of the WUA was during the general bi-annual budget meetings.

It furthermore became clear that decisions regarding the allocation of water, future investments in water planning and development (for example the proposed Kleinberg dam, the expansion of pipeline infrastructure and a planned water recycling plant) and other water related decisions such as finding responses to the rapidly increasing demand of the ever-growing population of thousands of people living in the settlements, were made by a small elite of commercial farmers in an informal management group, which strongly opposed the re-allocation of water for the benefit of the poor and marginalised.

The vice-president of the HVWUA (D2, April 2014, DeDoorns) explained:

There is day-to-day communication between [the vice president], me and the chairperson [the president]. We will talk about the issues, (...) a kind of informal management committee. We don’t want everyone to know, but the important people of us and that’s enough. We can’t involve everybody.

This made clear that management committee supposedly inclusive of all water users had no practical relevance. Decisions regarding water development and planning, water distribution and water allocation were made by a few commercial farmers in powerful positions within the WUA. The CEO, the President and the supposedly elected representative of the emerging farmers, who was in effect, a commercial farmer himself, owning shares in all the emerging farmers' agricultural projects. This 'shadow cabinet' in collaboration with the still existing Irrigation Boards made the important decisions regarding water governance in the Hex River Valley. Another commercial farmer (Commercial farmer CF 4, 2014) added: "We never vote for anything. On our annual meeting of all the members, then there will be some voting and it's those members that are on the LBO⁶⁴ list, those are the members that vote [the commercial farmers from the IBs]".

From a feasibility and management point of view it seems understandable that not ten thousands of people living in the settlements have not had access to the WUA decision-making structures. But an elected representative should be sitting on the Board to voice their concerns, as the WUA was planned as an inclusive institution to which all water users should have access, "regardless of whether they hold a formal water entitlement or not" (Brown 2014). This function of representation could be fulfilled by the Ward councillor. However, the CMA stakeholder and institutional engagement manager (CMA-3, April 2014, DeDoorns) explained: "The Ward officer is not part of the WUA, no." The Ward councillor is the mandated person to represent the people from the settlements. However, he was not part of the WUA MANCO and thus the 30 000 to 50 000 people living in the settlements were neither indirectly nor directly represented and thus had no say in water related issues.

A manager from the CMA involved in institutional and stakeholder engagement (CMA-5, April 2014, DeDoorns, Worcester) described that only those 'affected' by decision-making regarding water would be included in participatory processes. "I mean, obviously, you do not do public participation with everybody. If a community is not affected by a decision, they are obviously not an affected party". However, the body that determined who was affected and who was not, however, was the WUA and the CMA. But, the narrative of the CMA's water managers that poor in the settlements would not be affected by the decisions made by the commercial farmers in the WUA was simply not true. 94 per cent of the total available water used in the Hex Valley, was used for irrigation. The commercial farming sector in the Hex Valley as a whole was abstracting groundwater on a massive scale in the Hex Valley at four times the recharge rate of the aquifer (Umvoto 2011) causing the ground water table to drop increasingly. This again meant a reduced outwards pressure from the aquifers under the Hex towards the salty ground water contained in the geological formations bordering the Hex Valley to the north, which in turn, caused salt water intrusions into the groundwater of the Hex Valley. Thus, the impacts of the groundwater abstractions affected all other

⁶⁴ I was able to obtain the LBO list for the IBs in the Hex Valley, but was not given permission to publish it in any form. These lists however show the amount of hectares owned by the commercial farmers and the water entitlements attached to this land. They present the most important legal document for distributing water from the Sandrift scheme. Notably, this only refers to white commercial farmers, because the water stored in the two dams is fully allocated under Schedule 4 water use licenses of Existing Lawful Use.

inhabitants in the Valley, because the portion of the municipal water supply for the small town of DeDoorns and partly for the settlements depended on two boreholes. However, it became evident that the DWS lacked the capacity to engage, foster, monitor and control representation and participation of emerging farmers and the poor in decision-making regarding water in the WUA. But it also lacked the manpower to control water use, while the CMA also did not represent a line of control at all, but was rather dependent on the WUAs in terms of water governance on the ground while supporting the commercial farmers dominating the WUA to maintain their privileged water access.

The emerging farmers were entitled to be represented on the Management Committee of the WUA, because they were water users under the Constitution of the HVWUA (WUA constitution). However, in practice, none of the emerging farmers had ever participated in WUA establishment meetings or meetings regarding its operation in ten years of its existence. They had participated irregularly in yearly budgetary meetings; apart from that, they were not involved. This aspect will be critically analysed in the light of other research findings regarding representation in the next sections.

5.2.6 COLLABORATION

The idea of the legal and policy structures of NWA and the NWPR 2 was to foster “an atmosphere of joint decision-making” in the WUA, which was legally defined as “cooperative associations of water users, who wish to undertake water related activities for their mutual benefit” (NWA 1998). Representivity and collaboration were a central category of the NWRS 2 and NWA regarding institutional water governance. Through joint decision-making and collaboration, it was naively assumed to “radically transform the access to water for productive purposes of those previously deprived of water access and the resulting benefits.

The constitution of the WUA was the only legal document guiding everyday operation of WUAs in practice. The NWA 1998 provided a model constitution that the interested parties needed to develop collaboratively and attach to the WUA establishment proposal. However, the emerging farmers and the poor people from the settlements were not included in the process of drafting the Constitution or the WUA proposal: “It was us, the farmers who did all this, because it is our water” (President of HVWUA, D3, April 2014, DeDoorns). However, to include the poor and the upcoming black farmers in the process of drafting the Constitution was not stipulated by the NWA as a requirement. However the regulatory guidelines of the DWS for the establishment of WUAs (Guide for the establishment and operation of a Water User Association, DWA 2004), it was specified: “When all facilitation and consultation has taken place, an establishment constitution for a WUA can be prepared. Potential members of the WUA, as well as other stakeholders, should have the opportunity to contribute.” With ‘facilitation’ the whole establishment process is meant. This is further specified: “The facilitation time required depends on the levels of poverty and the strength of the historical relationship that the prospective members have with support institutions” (DWA 2004, p.5).

Considering the poverty prevalent in the settlements, the lack of knowledge of emerging farmers and the poor from the settlements regarding formal institutions of water governance and the close

historical relationships of commercial farmers institutions of the Apartheid (the IBs for example), such 'facilitation' should have been extensive and thorough. This, however, had never happened.

On the contrary, there was no collaboration between the poor people living in the settlements, emerging farmers and commercial farmers or between the WUA and the national DWS in the process. The capacities of the DWS were largely limited to ensure the basic foundation for collaboration, i.e. to physically get to the meeting or even holding such meetings in the first place.

In terms of collaboration, previously defined as 'doing things together in an organisation', as senior manager from the DWS (ibid.) continued to explain the discrepancy between de jure arrangements and de facto practices regarding the aims of the NWA, the NWRS 2 and other related documents: "So on paper it will say, 'they will capacitate each other in these meetings', but it is not happening. And the Department tries it utmost best saying that we need to empower them, but it is not working." One of the top three senior managers from the Breede-Gouritz CMA explained in 2014 that: "So for collaboration, I have not seen it in action in our area".

5.3 RULING THE GAME AND THE ROOM TO MANOEUVRE:

THE POWER TO ACCESS AND CONTROL WATER

In order to rule the game of water access and control in South African water governance, actors draw on their resources and capabilities as sources of power to influence. Such power stems from structural, agential and contextual sources.

Agential sources of power I have defined as the resources and capabilities available to a person or group to do something (power-to). This is further differentiated into theoretical categories relating to the categories of the three water user groups. I have thus used the well-known categories of the Sustainable Livelihoods Framework to analyse people's livelihoods (human, social, economic, physical and natural) to also provide the empirical ground for the analysis of their agential sources of power.

This is because the categories used to analyse livelihoods resemble the categories of power prominent in international scholarly literature dealing with power in its various forms. However, practically, this power is drawn upon by people to do something. 'Something' can be exchanged with a process relevant in everyday water governance, for example 'accessing information'. Information, however, can only be actively accessed by using physical or social resources and capabilities, such as technology (computer or smart phone), means of transport (to drive to the next government authority to obtain information) or through social channels (using other people's knowledge). However, a piece of information about water legislation in South Africa also needs to be accessed, understood and used in order to become a source of power. For example, without the human capability to read legal texts in the English language and to understand the legal 'nitty-gritty' contained in the paragraphs this piece of information is hardly usable. Furthermore, if a person then does not possess knowledge contextualising a certain piece of information, for example the knowledge about the process of a WUA establishment in the catchment he lives, he will likely not read the Act with the right focus, because he has nothing to apply his knowledge to. The power to do something is dependent the context in which it occurs and shaped by the rules which set the legal boundaries of social behaviour.

Continuing my examinations of empirical findings from the Hex River Valley, in the following sections I analyse how the players of the game used their power to access and control water for productive purposes. I thus revisit the findings presented above in the light of theory, but also introduce new ones.

5.3.1 LIMITED AGENTIAL POWER OF GOVERNMENT ACTORS AND THE ROOM TO MANOEUVRE

The lack of control, accountability and enforcement of CMA and DWS, I describe in the following as the 'room to manoeuvre': "You see somebody must take charge of the control issue. I have heard it many times here that for example somebody is just abstracting water [illegally], but if there is not someone to police and monitor that, than unfortunately there are some users that take advantage of it" (Senior water manager, Breede Valley Municipality September 2014, Worcester). The room to manoeuvre for commercial farmers was opened up by a lack of agential power at DWS and CMA to monitor and control the abstractions and use of water by commercial farmers. This made achieving the central goal of South African water governance almost impossible - the reallocation of water to previously disadvantaged black people.

The VandV program of the Water Allocation Reform tried to detect over-allocations of privileged white farmers and re-allocate them to the black population. A small-scale commercial farmer (Member of Ceres WUA, September 2014, Wolseley), who had been a member of the CMA's Management Board said with regards to a re-allocation of water for productive purposes: "For a fair allocation of water, you need to understand where is the devil in the detail. If you don't know how much water is available, how can you do that properly?" The nexus of lack of control, lack of core information about water allocations and use, a largely limited control over infrastructure operations, illegal water abstractions and power asymmetries, was described by the small-scale commercial farmer, ex-CMA board member and member of the Ceres WUA (September 2014, Wolseley):

The Breede-Overberg CMA is now in its seventh year and they are only now starting to verify existing water use, because the other processes took so long. But you cannot properly plan and implement your CMS [Catchment Management Strategy], if you do not have that core information. So there is no legal measurement of flow. Some of the systems are old, some are broken, some manipulated, some use is timely limited; so it is never verified and flow meters are not mandatory yet. Unlawful abstractions and altering the river flow is happening, no control. It is minefield to try and sort that out.

The process of VandV had not been completed in the Hex Valley by the beginning of 2016. According to the DWS none of the VandV processes had been completed in the entire country (DWS 2017). This reveals that neither the DWS nor the CMA had prioritised detecting over-allocations of commercial farmers the Hex Valley. This allowed the commercial sector to enjoy the benefits of a surplus of water, while the municipality had a water deficit of 300 000 cbm to supply the population of DeDoorns. Also, the few emerging farmers in the Valley did not have sufficient water to irrigate their small plots.

The lack of knowledge of DWS and CMA about water abstractions of large scale users in the Hex Valley, but also an evident lack of willingness of political officials to engage in socially complex matters, gave commercial farmers the room to manoeuvre to constantly restate their narrative that 'there is no more water available here in the Hex' and 'this is a water scarce area.' This however was only to disguise that the actual reason for water scarcity was the water consumption of the commercial farming sector.

In my metaphor of a game this meant that without the knowledge about what the players on the game of accessing water do, i.e. how much water they actually used under the license of Existing Lawful Use, the other players were largely disadvantaged. Commercial farmers were able to emphasize their dominant narrative of water scarcity as a truth and with it their argument of not having enough water to be allocated to the small-sale backyard gardeners in the settlements or emerging farmers, because nobody had enough knowledge to prove it false.

Other factors that opened up the room to manoeuvre for commercial farmers were the absence of a business plan of the HVWUA and the finding that the CMA was not overseeing the WUA operation. The business plans could have become an important element of accountability and control of WUA operations, including the representation and participation of black emerging farmers and people from the settlements or their elected representatives from the municipality or the ward councillor. However, the DWS had never demanded them.

The Breede-Gouritz CMA was not fulfilling its overseeing and coordinating role towards the HVWUA, but rather relied on the expertise of commercial farmers organised in the HVWUA to perform their role of water management agency, while openly prioritising the commercial farmer's water access, instead of improving water access of those previously deprived of it.

The key informant from the DWS (Senior manager at DWS, formerly involved in WUA establishment process, March 2016, Pretoria) described that this lack of capacity at the DWS would hinder not only effective establishment of WUAs, but would make the Department dependent on other actors representing the vested interests:

There is a big difference in resources and capacities. Transport is a big one for example to get there [to meetings about WUA establishment], but also knowledge. Even with some support, you have problems. So how do we [DWS] transport the people to the meetings? Do we do that at our risk or their risk, it starts there with insurance issues for example. But they cannot afford to pay their [own] transport. Commercial farmers on the other hand are fine, they all have transport and they are organized. So you ask the farmers, if they can transport the people. So you are almost like begging them to help.

It was apparent that the DWS itself had very limited resources and capabilities to mediate asymmetries in the endowment with resources and capabilities of actors in order to enable the less powerful to participate on equal footing in supposedly collaborative meetings. It also seems noteworthy as an expression of largely limited capacities that the DWS - 18 years after the enactment of the NWA - still had not resolved issues regarding transport insurances, but moreover lacked the financial resources to organise transport in the first place. This resulted in the DWS depending on the help of commercial farmers, which, in many instances, have shown to oppose the implementation of the new legislation wherever possible (see also Kemerink 2013).

The DWS itself confirmed (Deputy Director for institutional governance at DWS, January 2014 Pretoria) that the lack of financial and human capacity would hinder them to fulfil the political mandate stemming from the NWA 1998: "No, we don't have capacity to do what would be required by the Act." In other words, the DWS had not had the power-to implement their own legislation.

The above showed that the power of the referee to steer the game according to a set of rules, was limited. This provided the commercial farmers with the room to manoeuvre to use their agential sources of power to influence the development of the rules of the game, their application in practice and to dominate the contextual factors of the game, the livelihoods and livelihood capitals of the other water users.

5.3.2 STRUCTURAL POWER

To 'make decisions' and to 'set rules' which others have to comply with is a form of agential power (see also Brisbois 2015), to make the rules in which others are implicated. This is what Barbalet (1987, p. 1) calls "structural resources" of power and is evidenced by the notion that powerful agents might be able to play the game of supposedly collaborative water governance more skilfully by setting rules which others have to comply with. This is what Barbalet (1987, p. 1) calls "structural resources" of power and was evidenced by the notion that commercial farmers in the Hex Valley were able to play the game of supposedly collaborative water governance to their advantage by formulating the WUA Constitution. This was because they had sound knowledge of how to influence the formulation of rules of the 'game' to their advantage, and the social connectedness to government officials and ex-officials. In this case, commercial farmers' agential power led to structural power of setting the rules of the game in the absence of the referee.

Commercial farmers and their lobby groups (the IBs, other agricultural organisations like AgriSA and ex-officials still in offices at the DWS during the 1990s), were involved in formulating the NWA and the model constitution for WUAs included in the NWA. This, I have documented numerous times during this study (CEO of HVWUA D1, 2014; DWS a1, 2014; DWS a2 2014; Interview senior researcher CSIR, June 2015, Pretoria). For example, the CEO of the neighbouring Central Breede Valley WUA of the HVWUA told me that: "What actually happened was that my predecessor he was heavily involved in drawing up the new Water Act and the model for the constitution. (...). So when he transformed the IBs under his management he actually worked with the constitution that he had handed in."

This clearly shows that the old agricultural elites influenced the process of formulating the legal arrangements for the new water institutions - in this case, the operational manual, the model constitution for WUAs in South Africa. This also relates to the aspects discussed under transparency in section 1 of this Chapter. The IWRM consultants who were involved in the Hex Valley WUA establishment and had undertaken social work in the Hex Valley explained (Consultancy, November 2014, Worcester). "The way the Act was written it was seen a mechanism to transform society. It was meant to be legislated and initiated by government, but then led by community and their representatives in form of a [management] body. So it is supposed to be community-led, but it all depends how your constitution is formulated."

The CEO of the HVWUA (April 2014, DeDoorns) made clear how this became a structural resource of power when he explained: "But for WUAs, you can make the rules yourself. Draft a policy and rules; put it out to your members within 60 days. When our board decides this is the way to go, then you can act within the day. Under your delegated functions you act as statutory entity, its quick." This

was not what the normative NWA 1998 had dreamed about. But it was what the legislation allowed the WUA MANCO to do. The senior DWS manager involved in setting up WUAs in the Northwest Province (March 2016, Pretoria) explained:

Some of the farmers were even part of drafting the NWA and the WUA constitution; they know this law even better than we do. And they also know more about the local conditions than our Department officials, because we don't have enough officials to go to the ground. They know how to play the game.

Nevertheless, the empirical quintessence is that the rules in the game of South African WUA-based local water governance were significantly influenced by the very same persons who had been historically privileged. This constituted a major source of power allowing commercial farmers to rule the game of water access by developing the rules and legal procedures in which the game unfolded.

This is a manifestation of the power to create circumstances in which others have to act. The constitution had become a structural source of power of commercial farmers to limit the influence of others in the administrative process of decision-making and negotiations over water. Furthermore, by creating their own decision-making structures of an informal management group, commercial farmers further ignored national law.

Another structural source of power was expressed in the finding that the transformation of the five IBs in the Hex Valley into the HVWUA was merely a paper exercise. The five IBs had been renamed 'sub-districts' on paper of the HVWUA constitution, but in practice, the management structures, decision-making procedures and financial organisation have remained the same. The WUA MANCO was rather a coat for covering that decision-making in water related matters took place in the old Irrigation Boards, which in everyday water governance still existed as a shadow hierarchy hidden in the new formal structures.

Yes, the Irrigation Boards still exist, but Irrigation Boards are autonomous from the WUA. We have our own list of LBO and our own meetings plus one annual general meeting. But under the law, we are the big WUA. But [the CEO of the HVWUA] is helping all the Irrigation Boards, he sits on all our meetings. He is a secretary there. In Groothoek [Irrigation Board] he is our advisor and provides secretarial help. He does all the admin for all of the Irrigation Boards, said the chairman of the Groothoek IB.

The CEO of the WUA was regarded merely as a secretary to the Irrigation Boards, providing administrative support to the IBs managing their financial accounts and providing secretarial help to pool financial resources for water infrastructure development and planning. Overall, the old water governance structures of IBs and with it the decision-making regarding water distribution in the Hex Valley dominated by white commercial farmers remained functional, disguised in the shadow of the supposedly new WUA. A senior CMA manager (CMA-1, April 2014, Worcester) explained: "That is the purpose of a WUA, to take control of the water." The WUA had become a structural source of power for commercial farmers.

5.3.3 AGENTIAL POWER

Agential power is the ability to do something, the ability of an individual or group to make a difference' to a pre-existing state of affairs or course of events. It is the ability to act.

Empirically prevalent for the Hex River Valley was the existence of historically grown hierarchies between commercial farmers and of strong social connectedness among white commercial farmers. They were “incredibly loyal to each other when it comes to preserving their privileges” (Senior manager Breede Valley Municipality, September 2014 Worcester). This was also expressed through the finding that farm land in the Hex Valley was sold amongst the commercial farmers to bypass the open market: “Before the property comes on the market it is snatched up by another white guy. Or what they do is, they pay above market prices just to keep their hands on the water” (Small-scale commercial farmer, member of Ceres WUA, September 2014, Wolseley). In line with this, a commercial farmer from the Hex Valley said: “Of course I want to sell my land to another farmer, so that I know it stays in the right hands” (Commercial farmer CF 4, September 2014, DeDoorns).

The Municipal water manager responsible for the Hex Valley explained (Senior manager Breede Valley Municipality, September 2014, Worcester):

They would mostly sell the land amongst themselves, the farmers, because they don't want any people here that they don't know; they control it. They keep to themselves. If one wants to sell his property, he would ask his neighbour first and so on. And this is the same people that sit at the board [the IB, supposedly the WUA]. So land and water are in their hands.

This exemplified the still existing connection between land ownership and (historical) water entitlements, despite the NWA's intention to separate the two. It furthermore revealed that, opposite to what the new water legislation had promised, the WUA was a mechanism to control land and water resources preserving white privileged access to water for economic purposes, instead of breaking it. As expressed by one of the key informants (Emerging farmer EF 5, December 2014, DeDoorns): “I think the commercial farmers have much more benefitted from having all the land than from a WUA. But both go together, so controlling it helps, I guess.”

The agential power of knowledge provided commercial farmers with a distinct advantage over the emerging farmers, but even more over the DWS representatives, who oftentimes lacked knowledge about the local conditions and the local people. The small-scale commercial farmer involved in setting up WUAs in the Hex River Valley and Ceres Valley added: “What I have seen is that there is such a huge protection of the details of water management within the big guys of a WUA and such a huge amount of lobbying” (Small-scale commercial farmer, member of Ceres WUA, September 2014, Wolseley). This ‘huge amount of lobbying’ for the establishment of the HVWUA came in form of ex-officials of the Department of Water and Sanitation. At least two persons provided substantial legal and political support to commercial farmers in the Hex Valley in the process of drafting the constitution in their function of a contracted consultant. The CMA officials I interviewed called them “service providers” (CMA-5, September 2014, Worcester), but refused to disclose their names or those of their consultancy. This was an expression of the agential power of social connectedness manifested in the ability to develop a WUA constitution maintaining white privileged access to water

with the help of former DWS officials. As such, the structural power described in the previous section is emerging from the agential power of commercial farmers' knowledge, skills and social connectedness to knowledgeable people. Using these, they were able to formulate the rules for operating "their WUA" (CF 4, September 2014, DeDoorns).

Contrasting that, the research interviews with emerging farmers revealed that they had a limited knowledge about the operational rules of the WUA. They also possessed no knowledge about the purpose of the 1998 water legislation of transforming water access and control for historically disadvantaged people. The only way of obtaining information regarding WUA operation and especially about water distribution for the emerging farmers was to ask the commercial farmers or the CEO of the WUA. The same was true for physical water access. One of the emerging farmers (Emerging farmer EF 2, April 2014, DeDoorns) told me: "We have to wait until there is water. But now we don't have enough. We don't know when it will come again. That is the thing, we have to wait for them [commercial farmers] to tell us 'there is enough water and we can share with you'. When it is finished, they say there is no more." The emerging farmers in the Hex Valley had to realise their access through those that already controlled access. This means power of commercial farmers to control the water access of emerging farmers in the absence of effective regulations and enforced control and compliance.

However, information about water allocations and actual use was not disclosed to the emerging farmers (Emerging farmers EF 2 and 3, April, September 2014, DeDoorns). The CEO or the President of the WUA did also not disclose them to me. The Irrigation Boards, however, were informed by the CEO of the WUA about dam levels of Lakenvallei and Roode Elsberg dam and also information about the amount of water each commercial farmer had used. The president of the Hex Valley WUA explained: "We cannot allow it that anyone gets our water and we get less water. Because when we bought the system from the state 20 years ago they gave it to us, the farmers."

Collaboration in decision-making over the allocation and use of water for productive purposes with emerging farmers (let alone the thousands of poor from the settlements) was neither a goal of the interviewed commercial farmers dominating the WUA, nor of the staff of the CMA., the HVWUA was used to protect and secure white privileged water access in collaboration with the CMA. The vice president of the HVWUA (D2, April 2014, DeDoorns) expressed: "There is a saying that you only look after those who look after you. The WUA looks after the commercial farmers, because they are the people with the money."

5.3.4 WATER LOCKED UP IN THE PAST: CONTROLLING WATER THROUGH HISTORICAL OVER-ALLOCATIONS

Another component of structural power to access and control water was the prevalence of old water entitlements from the Apartheid period in current legislation. Water use entitlements in the Hex River Valley dated back to the 1956 Water Act. These entitlements of Existing Lawful Use (ELU) had been legally guaranteed under the post-Apartheid legislation (RSA Constitution, section 25; NWA 1998) until the DWS or a CMA would demand them to be converted into new water use licenses.

The black small-scale commercial farmer (Small-scale commercial farmer, member of Ceres WUA, September 2014, Wolseley) and former member of the Breede-Gouritz CMA management board commented on the resulting water access characteristics:

(...) some commercial farmers having 10 hectares, but sitting with water for 15 hectares. So it is very difficult, because you are sitting with farmers here that have excess water, much more than they need. Some of the farmers have 40 hectares of table grapes, but they got an allocation of 60 hectares. But they are not going to give the 10 hectares back to the Board, [the Irrigation Board/WUA] because they say 'you take the water and give it to BBBEE'. No, they will sit with that water until death comes.

For the water user group of emerging farmers, different statements have been recorded throughout the course of this research, but the foreman of a larger group of 36 small scale farmers (all farming together on the same land of 30 hectares pooling their financial resources) has formulated it in the following way when asked what the difference between a commercial and emerging or small-scale farmer would be: "the access to resources is the difference". He continued by saying "we are stuck with the water, but the commercial farmers are making use of their control over the water and they can expand [their farms] whenever they want". Another of the few emerging farmers in the Hex Valley assessed the influence of the Hex Valley WUA by saying: "They [the WUA] play a very important role. They influence our livelihoods directly, because they give water to everybody in the Hex. But the biggest challenge for me as a farmer now is water. Currently, I can water 25 % of my 25 hectares [of table grapes]".

The allocation of water in the Hex Valley favoured white commercial farmers. Four per cent of the total available water in the Hex Valley was given to emerging farmers. The targets of the WAR program had not been achieved, but largely failed. The allocations were not even close to the 35% of water that was supposed to be allocated to HDIs according to the official policy documents (NWRS 2).

However, as mentioned in previous sections, the combined agential power of commercial farmers manifested in the construction of the Osplaas dam.

5.3.5 THE STORY OF THE OSPLAAS DAM: AGENTIAL POWER IN PRACTICE

The importance of agential power in the form of financial means (described as the ability to do something) was exemplified through the construction of the Osplaas dam in 2007. At the same time it presents an example for the lack of agential power at the DWS. According to participants from the WUA, it took 5 years to obtain a license for the new dam from the DWS head office in Pretoria, but the construction started without legal approval. The CEO of the HVWUA explained (September 2014, DeDoorns): “We started building this dam without a license ... we said they must come and lock us up and do whatever they want, but we gonna start building this dam now.”

The Osplaas dam was privately built by collective efforts of commercial farmers with the purpose of storing their surplus ELU water. It was partly financed by the commercial farmers in the Hex Valley as members of the Hex Valley WUA and partly through a loan of the South African Development Bank (SADB) as well as money from the Breede Valley municipality (CEO of HVWUA, September 2014, DeDoorns; Senior water manager of the Breede Valley Municipality, April 2014, Worcester). The planning, development and construction was coordinated by the Hex Valley WUA. The Osplaas dam was privately owned by the WUA and the water stored in it was managed by the CEO of the WUA.

The Department of Water and Sanitation in 2007 released a media statement⁶⁵ on the granted license for the Osplaas dam praising it as a positive example of how “transforming the water sector benefits resource-poor farmers”. It stated: “Through a WUA, such as the Hex River Valley WUA, poor farmers or resource-poor farmers are able to access water through a shared system. People benefiting from these associations are resource-poor farmers, for example farmers with very little or no water for their livestock and farming purposes.” This refers to a promise of the HVWUA entailed in their application for a license to build this dam that emerging farmers would get 200 000 cbm from the Osplaas dam annually, which meant 6.6 % of the total volume (Municipal Report, printed copy 2013). In addition, the municipality was assured to also receive 200 000 cbm per year out of the newly constructed gravel dam. However, the Constitution of the HVWUA was never amended making it a legal obligation to deliver this water in actual practice and the proposal for constructing the dam is not a legally binding document. However, none of the emerging farmers interviewed for this study had ever heard about such an arrangement. They confirmed to receive water from the Sandrift scheme, but not from the Osplaas dam.

However, after my first round of data collection in 2014 in the study area the Osplaas dam presented an empirical puzzle to me. The dam had a storage capacity of 2.7 mio cbm and was located at the northeastern side of the Valley, which means it was theoretically catching runoff from the mountain ranges of the ‘Grootkloof’ gorge. But I found that the runoff from that gorge was limited and by far not sufficient to fill the dam (see also Holland & Associates 2010).⁶⁶ The gorge had a maximum abstraction capacity of 1 766 cbm per day (IDP 2007). Calculated over a year this added to 635 760

⁶⁵ Media release by the Department of Water Affairs and Forestry, 21 March 2007

<https://www.dwa.gov.za/Communications/PressReleases/2007/WaterWeek21Mar07.pdf> (accessed: April 2014).

⁶⁶ Holland and Associates. 2016. <http://www.hollandandassociates.net/public-documents/proposed-raising-of-osplaas-dam-hex-valley-western-cape/> (accessed: 27.06.2016).

cbm. Yet, I was able to look at the Osplaas dam full of water myself during my transect walks at the end of the irrigation period, a time during which no rainfall occurred. The dam should have been close to empty, if it were used for timely irrigation. This raised the question: where had this water come from?

The answer I revealed during my second visit to the study area: the dam was filled with water pumped from the individual properties of commercial farmers into the dam. The CEO of the HVWUA (April 2014, DeDoorns) confirmed:

The Irrigation Boards have pipelines from the Sandrift scheme, and they go into the Osplaas dam. That is their existing lawful use. [...] The Irrigation Boards [supposedly subdistricts of the HVWUA] have their own schemes, but they did not have enough storage capacity to store their own water. So they also bought into Osplaas dam. So they had existing lawful use, but they could not store it. That is mostly mountain run-off or dam water [from Lakenvallei and Roode Elsberg dam].

Confirming this finding again, the vice-president of the HVWUA explained (April 2014, DeDoorns):

(...) they [the commercial farmers] have an allocation from the Board [Hex Valley WUA] and a private dam. So they use their dam water first, so that you can never say that they have more than enough water. All farmers here do that. So they empty the dams first and then there allocations from Rode Elsberg. It is a psychological thing. If people see that water, they will ask 'why did you not use it'? And for this existing lawful use we built Osplaas.

This meant that commercial farmers were intentionally 'hiding' their Existing Lawful Use water out of sight from the rest of the inhabitants out of fear for more social protests. But more importantly it shows that the intent of commercial farmers to build the Osplaas dam in the first place, was to store their historical over-allocations. This in turn meant that in the Hex Valley probably two million cbm of irrigation water were over-allocated as Existing Lawful Use to commercial farmers.

However, the emerging farmers had not received the amount of water from the Osplaas dam that was once promised. This was confirmed by the emerging farmers and explained by one of them (Emerging farmer EF 4, December, 2014): "We do not have the water. That is the biggest challenge, too little water. We receive 11 000 cubic meters from the Irrigation Board [the WUA] [per year]".

The CEO of the WUA (2014) confirmed this by stating: "We have a rule: when the dam overflows, the emerging farmers will get the water". Research participants from the emerging farmers, however, had never heard of that rule (Emerging farmers EFs 1-4, April, September, December 2014, DeDoorns). Even if this cynical statement of the CEO was true and the emerging farmers would have received such water, they would not have been supplied on a regular basis with a constant and reliable flow necessary for the irrigation of sensitive crops such as table grapes. The point in time at which the dam would overflow is hardly predictable. A commercial farmer from a Hex Valley neighbouring catchment pointed out: "You cannot plan with the surplus water that might be existent in some seasons as overflow of the dam, or something. That is high-risk water; you cannot plan on that, not for vineyards" (Commercial farmer CF D, December 2014, DeDoorns).

Another finding is important in relation to the above. The Breede Valley municipality covered some of the initial construction costs⁶⁷ for the Osplaas dam to be entitled to receive 200 000 cbm annually to augment their supply capacity to the settlements and the town of DeDoorns. However, the municipality paid R 1.24 cent per cbm to the HVWUA. So, the HVWUA sold water from the historical water entitlements of the commercial farmers organised as members of the MANCO to the municipality, which sold it to the poor people in the settlements. This was the reason for the possible over-abstractions for the people living in the settlement of Sandhills, the CEO had mentioned earlier: the commercial farmers sold their historical over-allocations to the Dept. of Public Works, who officially owned the land Sandhills was located on. So instead of actually locating historical over-allocations and re-allocate them to black farmers (emerging or backyard), the lack of DWS control, knowledge, human and financial capacity, as well as a half-hearted implementation of the VandV policy led to a situation, in which the commercial farmers made profit from selling their historical over-allocations to the government.

Furthermore, the CEO of the HVWUA explained that the Osplaas dam would now be considered a part of the Sandrift irrigation scheme as an integrated system. Paradoxically, the commercial farmers interviewed for this study confirmed a price for per cbm for water from Sandrift of R 0.60 cent, before the Osplaas dam was constructed. After its completion the price for a cubic meter of irrigation water (including ELU and other licenses) in the Hex Valley increased to R 0.87 cent factoring in the investment costs and the operation and maintenance, as well as the electricity costs for the pumping station. However, the municipality was charged R 1.24 cent per cubic meter by the HVWUA - the price inclusive of the construction and operational costs for the Osplaas dam.

However, considering that improved access to water for productive purposes in order to develop sustainable livelihoods for the black and coloured population previously deprived of such access was the goal of the water policy, and furthermore taking into account that this dam was explicitly planned and subsidised by the South African Development Bank for exactly this purpose, the finding that commercial farmers used the underground pipeline system of the WUA to pump their historical over-allocations into a storage dam to sell it to the regional Municipality and other government authorities, which then sold it to the poor in the settlements, presented the opposite of what the South African water legislation and policy had promised and a perversion of its initial (and naive) ideas. Nevertheless, this practice was lawful under the NWA 1998 in conjunction with section 25 of the South African constitution and the Water Services Act 2004. In this sense, the formal legal structures became a source of structural power for commercial farmers to maintain their privileged water access on the basis of historical property rights. Further perverting the normative ideas of the new water policy, this enabled them to even sell water to the local municipality for profit, while still having enough water to replant 30 % of their vineyards with larger grape varieties, which would increase their water consumption by 30 %.

⁶⁷ The research participants were not willing to disclose the amount of money invested.

With regards to water supply from the Osplaas dam the small-scale commercial farmer as member of the neighbouring Ceres WUA commented (December 2014, Wolseley):

The late minister, Kader Asmal, had secured 30% of the water from our dam here in the Ceres Mountains for emerging farmers; otherwise we wouldn't get any water. It all depends on who builds this dam. If it is a private dam and you are not part of the negotiations, all the water will go the owners of the dam. So if you don't secure access rights when the dam gets built... Afterwards it becomes a problem, because they will tell you that there is no additional water, like in DeDoorns.

One of the emerging farmers (Emerging farmer EF 1, April 2014, DeDoorns) summarised this: "I don't know how it works, I just get the water. When it is finished, we ask them [the commercial farmers] for more, but they always say us that there is no more water."

In the absence of the referee of the game, commercial farmers used their agential power to create facts, which could not be reversed afterwards. They opposed the implementation of the political agenda of redress and greater equality while re-interpreting rules or simply by ignoring them.

5.3.6 CONTEXTUAL POWER

Contextual power in my theory frame refers to two dimensions: first, the social habits and practices of 'how to do things' (see Bourdieu 1989) around water driven by a historical hierarchy. It is the ability to "create conditions or control circumstances in which others are implicated" (Barbalet, 1987). Second, contextual power also means the ability to influence the agential powers of actors. This means to, willingly or unwillingly, influence the livelihood capitals of other water users, which again, are utilised in negotiations over water in the WUA to influence processes of water governance. Within my metaphor of a game, contextual power is the power to determine the attributes of the game arena in which others live their lives and thus to influence how pursue they pursue their livelihoods. Commercial farmers were able to influence the power base of others, by directly influencing the broader circumstances (work conditions, salary etc.), which shape the livelihood capitals of others. Over time these conditions and circumstances and related practices became constant, taken for granted and are thus turned into a self-enforcing 'order-of-things' (Peters and Pierre 2007).

For example, in the Hex River Valley farmers were allowed to determine the working conditions of the poor from the settlements without any state control or regulation. They prescribed the time of work, the working hours, the salary and employed them when necessary, but fired them at will without any form of working contract. By controlling this, commercial farmer's own livelihood practices - knowingly or unknowingly - determined the financial side of their workers livelihoods.

By determining the working hours, commercial farmers had a relatively direct influence on the social capital of participants of this research. After 10 to 14 hours of work on the fields, they were physically exhausted, and not able to engage in other activities. It thus had a direct influence on the time people had left during the days to take engage in social activities. They had also no time - and not other option - to care of their children in the settlements, to take care of their food gardens or to

engage in matters of politics. All of the participants had health problems, showed and voiced extreme fatigue, were sad and appeared to have no energy. This of course was also due to the fact of working five months a year in a constant hectic pace during the hot summer, while living in the cold environment of the Hex Valley winters in their dwellings offering little shelter.

People from the settlements as seasonal farm workers were depended on the work provided by the commercial farmers in the Hex Valley, as no alternative job opportunities existed for the low skilled and poor. They also did not possess the means to explore other options, nor have they had the knowledge or finances to do so, for example to pay for a taxi to Worcester to seek work (although in Worcester no job opportunities existed either). The limited agential powers of the poor from the settlements opened up the room for commercial farmers to act. For example, if the other alternative job opportunities for low skilled workers would had existed, and a public transportation system would have allowed participants to travel further to seek work, or if their education would have been better or their financial situation, they would have had a more solid base of resources and capabilities to pursue alternative livelihoods and the powerful position of commercial farmers shaping the livelihoods of the poor would have been at least not as strong, due to the availability of alternative livelihood choices.

However, with this I am analysing how the working conditions controlled by commercial farmers influence the livelihood resources and capabilities of their workers, on which they, in turn, draw upon to engage in processes of water governance, or even local politics or getting organised. With this I am not arguing that this context is solely a direct result of commercial farmers intended actions. On the one hand, they were providing around 25 000 low skilled people with jobs. On the other hand, it is fair to say that the poor were providing commercial farmers with their workforce. But the question of who was socioeconomically more depended on whom to a greater degree, although a highly interesting question, is not the crux of the matter here, but the finding that the socioeconomic context, basically all economic activities, were dominated by the same elite of commercial farmers. Thus, commercial farmers were able to determine possible actions of other actors by determining their financial, human and social livelihood capitals to a large degree. In addition, the contextual power has also manifested in the finding that bribery was taken for granted as part of the life as a commercial farmer in South Africa, as it is also the case in many other parts of the world (Ribot 2004; UNESCO 2015).

Another dimension of contextual power emerged through the finding that the combined ground water abstractions of the commercial irrigators in the Hex jeopardised the water supply of the entire Valley. The result of abstracting ground water on a large scale was a reduced outward pressure in the water bearing geological formations under the Hex Valley towards the salty geological layers from the Karoo region bordering the northern part of the Hex Valley. This again resulted in saltwater intrusions into the groundwater aquifers under the Hex, on which again, the municipality relied to supply water to the inhabitants of the DeDoorns and the poor settlements. This pattern keeps reoccurring, the actions of commercial farmers, willingly or unwillingly, directly or indirectly, influenced the livelihoods (here the biophysical dimension) of the other inhabitants of the Hex Valley in a negative sense.

Commercial farmers controlled the working conditions of the emerging farmers employed by the WUA; they controlled the flow of hydrological and infrastructure related information and they physically controlled the amount of water given to the emerging farmers; they owned the distribution infrastructure and had the agential power to construct the Osplaas dam and store their surplus ELU. The emerging farmers were not in a financial position to buy heavy agricultural machinery themselves or in the case they owned such equipment, they were not able to pay for the spare parts. As such, they borrowed tractors and ploughs from commercial farmers. Sometimes they were helped, sometimes not. All of those factors put the commercial farmers into a position, in which they could influence, intentionally or unintentionally, many of the livelihood circumstances and also the resources and capabilities of emerging farmers.

However, these rather hidden historical hierarchies between commercial and emerging farmers also influenced the way people behaved in matters of water. This relates to the finding that although emerging farmers complained about a lack of access to water for their small table grape farming projects, they never voiced this towards the commercial farmers when participating in the annual budget meeting or during their interactions with them as employees in the WUA workshop. They never complained to the DWS. There was also a deep reluctance prevalent among emerging farmers to demand information about water resources and the ways the WUA governs them. This hesitancy to claim the right to access to information (as pertained in the NWA, NWRS 2 and the WUA constitution) however was rather a product of historically grown and socioeconomic hierarchies of information flow that are still an influential factor in how the WUA operates. All of the emerging farmers had grown up working for the commercial farmers on their fields during the Apartheid and continued to do so currently, while also being employed by the WUA. One of the emerging farmers explained (Emerging farmer EF 3, December 2014, DeDoorns): “I can’t speak up against my boss, you see.”

Furthermore, the narrative of commercial farmers framing the available water in the dams as ‘their water’ was also used by emerging farmers. One of the two emerging farmers farming next to the WUA offices described (ibid.): “We have a good relationship with them [commercial farmers]. But when it comes to *their* water, yo my friend, when the groups come together and we want more water, then it can get tricky.” All the emerging farmers were deeply reluctant to demand anything from the commercial farmers. They perceived the water they were receiving from the commercial farmers, as kind of a favour, not as a right stemming from the NWA 1998 (ibid.). Furthermore, all emerging farmers classified the WUA as a ‘private organisation’ of farmers in the Hex Valley that was affiliated with the ‘boards’.

These two statements pointed towards the hidden dimension of power. Woven into the perceptions of emerging farmers of ‘how to do things’: it was the commercial farmers’ water and they shared it with the emerging farmers as a kind of courtesy. Furthermore, because the emerging farmers were employed by the farmers as well as working for the WUA, they did not dare to ‘speak up’. They had no knowledge that they were entitled to sit on the WUA MANCO and did not know that they were supposed to be beneficiaries from water management through WUAs. The commercial farmers had no incentive to tell them, as this would have threatened their control over water in the Hex, as well as their control over the emerging farmers by creating the conditions in which they were implicated.

Commercial farmers controlled the flow of information, the physical amounts of water given to emerging farmers and the decision-making within the HVWUA. By controlling the amount of water they controlled the natural capital of the livelihood of emerging farmers. Being employed by the HVWUA and working on the farms of the commercial farmers, made emerging farmers depended on the decisions of commercial farmers and their historically grown hierarchies were strengthened. The financial capital of their livelihoods was largely influenced by commercial farmers. “You don’t bite the hand that feeds you. They don’t speak up, because the farmers they control everything” explained the municipal water manager of the Breede Valley Municipality (April 2014, Worcester). They controlled the working conditions of the emerging farmers employed by the WUA; they controlled the flow of hydrological and infrastructure related information; they owned the distribution infrastructure and the Osplaas dam and the purchase of the land of two emerging farmers was done by the CEO of the WUA, not involving the emerging farmers in the details of it, but maintaining the emerging farmers already existing socioeconomic dependency.

The agential power of commercial farmers to influence the formulation of the WUA model constitution and even the NWA 1998 was one factor in ‘taking over the WUA’ by dominating the rules of the game. Another important source of structural power was the writing ‘their own’ rules in the WUA constitution. The absence of monitoring, regulation and control of the HVWUA establishment and operation and a lack agential power of the DWS or the CMA, offered commercial farmers ‘the room to manoeuvre’. The CMA was rather supporting the HVWUA in their efforts to control water and maintaining the ‘order of things’. The CMA managers regarded this collaboration as the ‘normal way’ of doing things in an ‘agricultural area’, in which they themselves had grown up during the Apartheid (except for the most senior manager, the interviewed staff of the CMA were white persons, who had mostly worked for the previous DWS during the Apartheid). The Breede-Gouritz CMA became a strategic ally in the game of accessing and controlling water in institutionalised water governance. Commercial farmer’s control over land resources strengthened their control over water resources and physical access.

From a cross-case perspective on the game of accessing water through mechanisms of formal water governance the empirical findings presented induced the following questions for interrogating findings from the second case study: how was this game played by the three water user groups in the Groot Marico catchment of the Northwest Province of South Africa, where a WUA establishment was attempted by commercial farmers, but had been rejected by the national Department for Water and Sanitation? Why had it been rejected and furthermore, which formal access mechanism applied in the absence of WUA and CMA?

CHAPTER 6: THE GROOT MARICO CATCHMENT

This Chapter presents an analysis of the findings from the second case study. It provides additional empirical insights to answer the questions outlined in the beginning. How has the normative vision of the political strategy of improving water access of the poor and marginalised to better their livelihoods found its way into South African realities on the ground? Finally, how have local actors played the game of water access and control using their resources and capabilities as sources of power?

6.1.1 CONTEXTUALISING THE GAME AND ITS PLAYERS

The Crocodile (West) - Marico WMA lies predominately in the North West Province of South Africa, while parts of it are located in the northern area of the Gauteng region as well as in the southwestern corner of the Limpopo Province. In the north-west, the WMA is bordered by Botswana (DWA 2003) as can be seen in Figure 13 below.

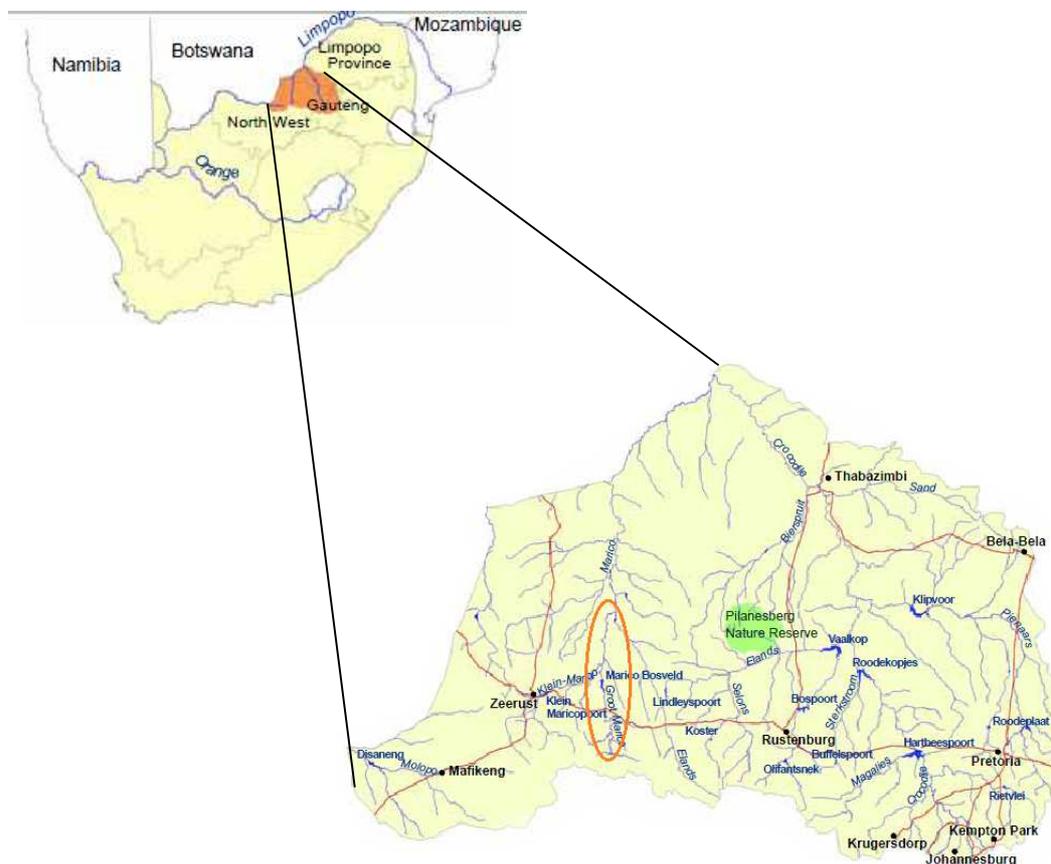


Figure 13: The former Crocodile (West) - Marico WMA (in brown) in South Africa and the study area are encircled in orange (DEAT 2005; adapted from Förster 2011).

The WMA was renamed and merged with its neighbouring WMAs to form the Limpopo WMA in 2014\2015.⁶⁸ However, its catchments and sub-catchments remained divided into the same sub-management areas, which respond to the catchments of the larger rivers. The field research focused on the smaller catchment of the Groot Marico River, highlighted with an orange circle in Figure 13 above.

The broader Northwest Province (NWP) is prominent as one of the world's larger mining areas for platinum, chrome and gold and the Rustenburg area of the platinum belt is the largest mining region in South Africa. About 25% of the country's Gross Domestic Product (GDP) originated from within the Limpopo WMA, containing the former Crocodile (West-) Marico WMA. The Crocodile River performed an important ecological service to these economic activities and with it to a significant portion (approx. 8.2 million) of the South African population (Tempelhof et al. 2014).

Locally, the Groot Marico River performed a similar function. The area was also known for its large scale irrigated agriculture and cattle farming. The Marico Bosveld Dam (MBD) provided 2 700 hectares of farmland with irrigation water transported through the open canal system of the Marico Bosveld Irrigation Scheme (MBIS). Around 50 000 people north of the dam depended on the Marico River for their livelihood (Head of Groot Marico information center November 2015, Groot Marico). The main crops farmed by the approximately 48 commercial farmers in the study area were maize, wheat, tobacco and barley. They were sold either directly to local branches of international companies in Zeerust or to the regional distributors and intermediaries in Koster. However, many people from the poor communities the Marico catchment, but also from other residential areas in the Northwest Province (NWP), worked in the mines owned by mostly international mining companies, or as farm labourers on the fields of commercial farmers. However, overall unemployment rates of up to 80% per cent were the norm in poverty-stricken rural towns such as Groot Marico, Zeerust, Koster or Derby, and even more so, in the rural villages and settlements such as Koffiekraal and Skuinsdrift north of Groot Marico.

However, mirroring the rather racialised agrarian structure of agriculture in the country as a whole (Cousins 2009), the study area showed a highly developed commercial farming sector existing side by side with poor rural communities practising subsistence farming on a small-scale. The former generally enjoyed easy access to sufficient amounts of water, while the latter battled with limited water access for human consumption, let alone watering their cattle and small fields sufficiently.

Overall, in the new Limpopo Water Management Area, 80 per cent of the registered water use was by white commercial farmers (Movik and De Jong 2011).

⁶⁸ In 2014\2015, the nineteen WMAs in South Africa were merged to a number of nine. The Crocodile (West) - Marico WMA was merged with the Limpopo WMA to form the new Limpopo WMA. However, the tertiary and quaternary sub-catchments were not spatially changed, so that this research focused on the same area in terms of hydrological and spatial boundaries. Potential outcomes of this administrative realignment can however not be included in this thesis, due to academic boundaries of a given word limit.

6.1.2 SOCIAL CAPITALS: DEMOGRAPHIC AND RESIDENTIAL PATTERNS

The small town of Groot Marico had a population of 3 400 people living on an area of 36 square kilometers according to the latest census of 2011. Black African people accounted for 3 000; the white population group consisted of 300 persons; people of Indian and Asian background numbered 70, while the (so called) coloured population accounted for 40 persons (IDP, Moses Kotane Municipality 2011). However, with only small exceptions, the inhabitants of the rural villages were of black African descent.

Rising population numbers, increasing wealth and standard of living (although increasing slowly) put additional pressure on the existing water sources through a growth of demand (NWP Environment Outlook 2008). From 2007 to 2010 the population in the Northwest Province grew by more than 500 000 people, the fastest growth in recored history, a population growth of between three and four per cent (StatsSA 2017).

Outside the town centre of Groot Marico a settlement emerged in between 2011 and 2015. In 2013 the government had started to construct RDP houses according to the idea of developing what had become an informal settlement into a formal one (as if this would just magically happen). However, as also seen in the Stofland settlement in the Hex River Valley, this idea had been overtaken by the pace of reality of population growth and next to each new RDP house shacks were built adjacent to the outer wall while the original inhabitant collected a small amount of money from the 'tenant'. In 2015 it was estimated (Head of Groot Marico information centre, June 2015, Groot Marico) that around 3 000 people would live in an area planned to accommodate 1 500 people. These demographic realities of a growing population and social practices of housing put enormous pressure in the already limited capacity of the municipality to supply this settlement with water and to provide adequate sanitation systems. However, sanitation infrastructure was never planned for, and apart from some loose sewer connections sanitation and hygiene facilities were rare (pers. obs. 2016). Human waste was collected only irregularly from the overflowing septic tanks, and was running down the narrow aisles of the settlement seeping into the groundwater and into the Marico River (pers. obs. 2016).

A Deputy Director in the Department of Water and Sanitation for the section of institutional governance (January 2014, Pretoria) explained: "We have many social problems, especially in the rural areas. The Department tries as best as we can, but it is not enough."

Historically, most people living in the visited rural villages of Koffiekraal and Skuinsdrift, Uitkyk and Pella, belonged once to a large tribal nexus of the broader Botswana and Setswana people. Among the early residents at the Marico River were the Bahurutse, mostly descending from the Sotho-Tswana speaking people who settled in the area from the 15th century onwards and a number of century the Khoi and the San had also been integrated into their society (Schapera 1984). Around the 17th century the locally rather scattered communities began to move towards the foothills of the mountainous areas along the Groot Marico River. "We all have the similar traditional roots, you see, and they are here at the River. They have always been here", said the leader of the community (Koffiekraal, November 2015). Before white colonisation the Tswana-speaking people occupied

territories that stretched over today's state and provincial boundaries including the South African Provinces of Northwest, Limpopo and into bordering country of Botswana.

The arrival of the early colonists in the 16th century, the following rule of the British and the Dutch 'Afrikaaners' forced the Hurutse to live in small reservations. English and Dutch settlers and the following Apartheid regime, however, forced the Tswana people into small territories. Under the Apartheid regime, the reservations became small, village-like 'homelands' providing pools of cheap labour to the large-scale commercial farming sector and international mining companies (Nicolau 2013). As such, this hilly terrain stretching over 250 000 hectares formed a block of the Bophuthatswana homeland, into which the broader Tswana people were forcefully resettled (van Niekerk and Pisani 2006).

As a result of this (and other developments during the Apartheid) the (Se-) Tswana who once settled along the Marico, now lived in the mentioned rural villages with a population of each around 5 000 - 15 000 people with an average household size in between three and four people (IDP Moses Kotane Municipality, 2013). The total number of people living in all the traditional communities north of the Marico Bosveld dam was estimated to be around 50 000 (Tempelhof et al. 2014).



Picture 9: Forms of housing in the village of Koffiekraal

However, the names of locations and villages in the area from Koffiekraal to the end of the small town of Groot Marico are from the Apartheid period, but have become common terms to describe places the area⁶⁹. Skuinsdrift for example is not an official name of a village, but was coherent farm of hundreds of hectares during the Apartheid, which was later split up into smaller plots. It was a common strategy to divide the large farms into smaller plots stretching from west to east over 5 Km, but only a couple of hundred meters from north to south. However, Skuinsdrift was not used to describe an official name of a village, but rather settlements and encampments of housing in a certain area; the people living there were referred to by participants as Skuinsdrift community.

⁶⁹ If I had information about the traditional name, I have provided it in the sections below.

The area from the town of Groot Marico to Koffiekraal in its south to north stretch and from the Marico River to the end of the irrigation canals were the spatial boundaries of this case's study area.



Picture 10: The study area of Groot Marico catchment with the town of Groot Marico in the east, the rural village of Koffiekraal in the north and the two dams

Participants of this research were mostly people living the communities of Skuinsdrift, Koffiekraal and the rural town of Groot Marico (some participants of meetings and informal conversations also came from the villages of Pella, Brakuil and Uitkyk). From the small town of Groot Marico to the village of Koffiekraal it was a 30 minutes' drive from the Marico Bosveld dam until the end of the system of open canals transporting irrigation water to the farms east and west of the Marico River through the MBIS. From Koffiekraal it was another 15 minutes' drive to the communities of Brakuil and Uitkyk. Members of Brakuil and Skuinsdrift were however mostly interviewed in Koffiekraal when they met for tribal meetings or at the information centre⁷⁰ in Groot Marico. I visited Brakuil, Pella and Uitkyk on three occasions together with the tribal leader from Koffiekraal. He was operating under the authority of the tribal chieftaincy of the broader Hurutse people.

Nevertheless, before progressing further in this Chapter it is important to note that these villages were under tribal authority, governed by their tribal council in daily affairs, while also being part of the state's municipal system.

⁷⁰ Besides being a place for inhabitants of Groot Marico to talk to each other and engage in discussion regarding their livelihoods, it was also a centre where local people met to exchange knowledge and collaborate in important matters. The growing settlement in Groot Marico and the occurring pollution of the Groot Marico River with human waste from the old and ailing nearby water works, were the most pressing concerns in conversations during which I was present.

6.1.3 SOCIAL CAPITAL OF TRADITIONAL GOVERNANCE

The traditional communities in the study area held their collective meetings of the tribal council in the village of Koffiekraal located at the end of the Marico Bosveld Irrigation scheme. However, the use of the grammatical plural 'communities' here expresses my understanding that 'the community' as a homogenous entity does not exist (Ribot 2009), but that among the approximately 8 000 to 10 000 people living in Koffiekraal and the other villages further sub-communities, groups and different social clusters existed.

However, the community leaders from the villages of Koffiekraal, Brakuil, Pella and Uitkyk described themselves as belonging to the broader Hurutse people organised in a system of traditional governance (February 2016, Koffiekraal).

This system developed over hundreds of years⁷¹ and was also practised during the Apartheid to a certain degree, as the Apartheid government gave authority to chieftains⁷² to govern a certain territory within the segregated 'black homelands' (also called 'Bantustans'). However, the Bahurutse Bo-Mokgatlha in Koffiekraal were organised in a rather democratic decision-making forum called 'Morafe'. This governance unit comprised one leader - the Kgosi - and a group of eleven advisors from the surrounding villages, called 'gates'. A person became Kgosi through an ancestral system: the first-born son of the previous Kgosi was to become the traditional leader. But to become traditionally appointed, he also had to be chosen by the majority of a group of the eleven people organised around the Kgosi in a kind of round table format called 'Khosana'. The eleven men in the Khosana represented the surrounding 'gates'. Although the Kgosi had considerable power, without the majority approval of his advisers he was not able to act on his own. If the Khosana decided unanimously on it, the Kgosi could also be forced to step down to make way for another leader, within a system of traditional checks and balances. However, within these gates, the Khosanas were chosen by the people living in this gate according to leadership structures based on ancestral lines. Morafes were also the platform for people living in neighbouring areas to discuss, learn and collaborate in matters of mutual interest. The Kgosi had the power to lead through his authority based mainly on respect for his knowledge, social connections and his ancestral history; he was described as the leader, but any final decisions were taken by the entire Morafe. Every member spoke about an issue and this presented his opinion on a matter. After all had spoken the Kgosi would make a decision. "But he can't go against his advisors, you see, because he needs them also" said the traditional leader of the Koffiekraal tribal council (January 2016, Koffiekraal). Furthermore, a body called Legotlahs presented a traditional court, in which the elders of the community would judge their own people in case they had done something harmful to another member of the community or the community as a whole.

⁷¹ For the description of this system, I thus do not claim comprehensiveness, nor do I claim it to be without fault.

⁷² The oftentimes negative social consequences of installing people into power rupturing historically grown forms of social organisation can be read in Tempelhof et al. 2014 and Movik and De Jong 2010 for example.

However, I have participated in two Morafes, one in March of 2011 and one in January 2015. The results of their discussion with me, but also amongst themselves were often summarised by the leader of the community of Koffiekraal, who also operated under the authority of the broader Hurutse chieftains mainly in the area between Groot Marico, Koffiekraal, Brakuil, Uitkyk and Pella (please see Figure 14). Through him⁷³, I was able to gain the trust of the people before I was invited to participate in their social events.

Even the large-scale commercial farmers under the Marico Bosveld irrigation scheme knew him as a respected community leader. In addition, the tribal council had an official secretary as an administrative bridge to the formal municipal structures of the South African state. As such, the secretary mostly handled all the correspondence with the municipality and other state authorities. "We are a traditional community; we have our own systems," explained the tribal leader of Koffiekraal. However, these forms of tribal organisation based on centuries of traditional oral history, were woven into the social fabric of today's livelihoods of the rural people. It was evident that the tribal authority⁷⁴ was a well organised and the tribal council presented important platform for social exchange of knowledge and experience and had a participatory and rather representative system of decision-making. It also represented and connected the communities from the eleven surrounding villages and settlements socially through the gates of the Morafe.

The matter most often discussed was described with the words of a participant in Skuinsdrift (February 2016): "Water is the most valuable here. Without it, there is nothing here, no food, no cattle, nothing."

⁷³ Peter Pefoe of the Bo-Moghatla Bahurutse people was the second born of the former tribal chief called Kgosi. He was given the authority of the traditional Hurutse chieftains in the study area to operate on their behalf. Phefo, being 33 years of age, had experienced work in the mines near Rustenburg during the Apartheid, forced to make living in his youth out of the degrading and largely dangerous work. He had never seen a formal school from the inside longer than for a year, opting in and out of primary school in order to support his parents. However, he taught himself the English language with the help of old books and with the help of the German social workers, who ran the Madikwe Rural Development Project in Skuinsdrift. He was fluent in Afrikaans and English, written and orally, and spoke five of the local dialects.

⁷⁴ The French Institute for Research and Debate on Governance (IRG) offers an interesting analysis of land governance and traditional leadership in South Africa <http://www.institut-gouvernance.org/en/chapitrag/fiche-chapitrag-66.html> (accessed: August 2017).

6.1.4 BIOPHYSICAL AND SOCIAL CAPITAL

Climate in the study area was generally temperate, but varied significantly from a semi-arid east to a drier western zone. Average temperatures in winter (May-July) were around 16°C, whereas summer temperatures ranged from 22 to 38 °C. Rainfall occurred seasonally, mostly during thunderstorms in the summer months of October-March. Mean annual rainfall was around 400 - 500 mm (DEAT 2005).

The Marico River gave the catchment its name. It encompassed the Klein Marico River and the Groot Marico River. The Marico was the source of the large transboundary Limpopo River on the border between South Africa and Botswana. Tributaries of the Groot Marico River were the Rooislot flowing from a source south-west of the MBD and entering the Groot Marico after the MBD. The Klein Marico River originated near the town of Zeerust and joined the Groot Marico River approximately 5 Kms downstream of the Marico Bosveld Dam (MDB). Both streams originated in the hilly area between the towns of Groot Marico and Zeerust. Favourable hydrogeological dolomite formations in the higher regions of the Zeerust area enabled the development of aquifers acting as the natural storage reservoir feeding the free flowing Marico Rivers. During the drought of 2005 the River still held a flow of water representing the lifeline of the whole area (Head of the Groot Marico information centre, November 2015 Groot Marico), but especially for the rural communities downstream such as Koffiekraal, who relied on poor groundwater and the Marico River for their livelihoods.

However, the water of the Klein Marico River was dammed into the Kromellenboog dam (KBD). The dam was built 1935 and the land was formally listed and then sold among the colonizing white farmers, while forcefully relocating the traditional inhabitants. The large farms portioned out of the occupied territory were given the names of Riekertsdam, Haakdoorenbolt, Straatsdrift, Koffykraal, Koppieskraal, Skuinsdrift, Veeplats and Zamekomst with around 3 000 hectares listed under LBO⁷⁵ owned by approximately 60 farmers (please see Figure 14 below). After the second World War the white population receded gradually and some moved away. Around 48 commercial farmers and their families were farming in the area in 2016 (Head of MRDP, January 2015 Skuinsdrift).

The Marico Bosveld Irrigation Scheme distributed water from the Marico Bosveld Dam (MBD) and the Kromellenborg Dam with a combined storage capacity of 39 mio cubic meters (DWS website 2017).⁷⁶

⁷⁵ LBO is a document listing the amount of hectares owned by the commercial farmers and the water entitlements attached to this land, respectively the farmer.

⁷⁶ DWS website, dam information <http://www.dwa.gov.za/Hydrology/Weekly/wmaWeek.aspx?region=8> (accessed: June 2015).

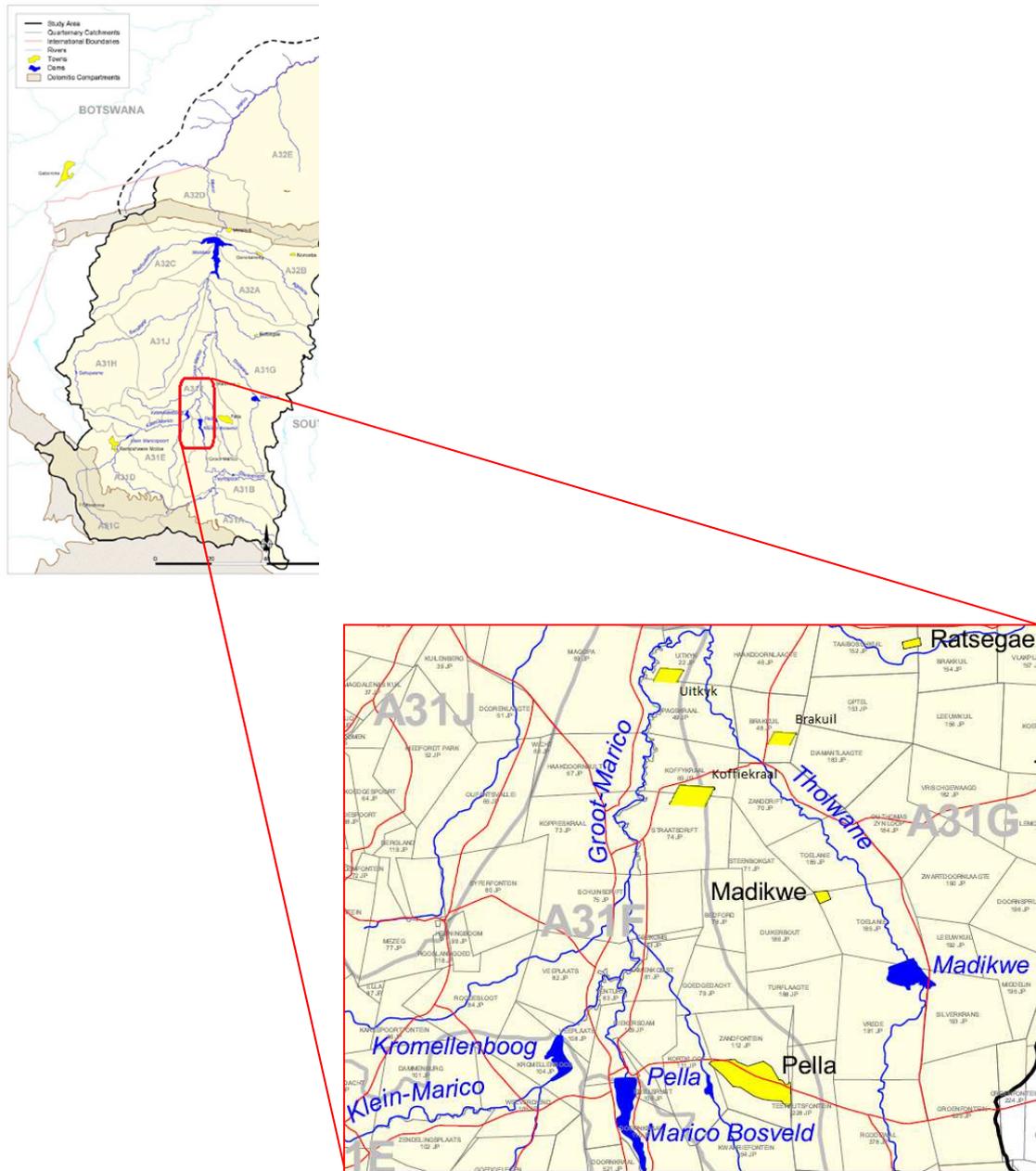


Figure 14: Water courses and dams (blue), villages (yellow) and farm boundaries (grey lines) in the Hex River Valley (in red in the upper figure). The Skuinsdrift community is located on the former Schuinsdrift farm.

Also part of the WMA is the westward flowing Molopo River, a tributary of the Orange River (DEAT 2005; DWA 2003). Total mean annual runoff (MAR) in the CWM-WMA added up to 855 Mm³/a. Approximately, 75 % run down the Crocodile River and its tributaries.

Twenty per cent came from the Marico River and the Molopo contributed about 5 % to the total mean annual runoff (MAR) of the catchment (DEAT 2005; NWRS 2004). Table 6 below shows the MAR of these rivers and their major tributaries, as well as the amount of water for the ecological reserve⁷⁷ contributed by each water course.

Table 7: Natural Mean Annual Runoff and Ecological Reserve (Mm³/a) (NWRS 2)

SUB-AREA	Natural MAR	Ecological Reserve
Apies / Pienaars	142	34
Upper Crocodile	253	57
Elands	113	15
Lower Crocodile	138	25
Marico	172	29
Upper Molopo	37	4
TOTAL for WMA	855	164

However, I found that in the study area along the Marico the environmental reserve was a concept that existed on paper, but not in practice. The 29 million cbm per year supposed to remain in the river at all times, was not enforced, because water was so contested that the Reserve was not assigned priority. As participants from Koffiekraal, Brakuil and from Groot Marico expressed repeatedly that in dry times no water would be left in the stream due to evaporation rates, but more so due to increased abstractions for large-scale irrigation (Tribal leader of Koffiekraal, January 2015, Koffiekraal).

However, the town of Groot Marico relied on water pumped directly out of the river as their major source of drinking water. "Our main source of water in Groot Marico town is the Marico River. Only some have boreholes, but the large majority gets it when it is pumped out of the river," said the head of the Groot Marico information centre, which is also a centre of local social activists with the mission to preserve the area's natural heritage. "When it is raining the sewage plant is absolutely not capable of treating the amount of wastewater that comes in of the 900 and more houses. So it overflows and the untreated wastewater goes directly into the stream, from which we take our water" (Head of Groot Marico information centre, September 2015 Groot Marico).

Adding to this, a constant influx of people from Botswana and Zimbabwe put additional pressure on the existing and already largely limited service delivery of the Ramotshere and the Moses Kotane municipalities in which area of responsibility the study area fell. Especially in the village of Koffiekraal this was prevalent and social tensions were building up between the newcomers and the local indigenous South Africans.

⁷⁷ The Reserve comprised two components: The ecological reserve refers to water required to protect and sustain the aquatic ecosystems in order to foster ecologically sustainable water use. The Basic Human Needs Reserve is the water allocated for human consumption before any other water can be assigned (WRC 2008). An environmental consultant hired to assess the ecological reserve in 2013 explicitly expressed not to be cited in this thesis. The consultant, however, explained to have been threatened by commercial farmers not to officially increase the amount of water needed to sustain basic ecological functions after refusing to accept a bribe.

The tribal leader of Koffiekraal explained (January 2015, Koffiekraal):

I am foreseeing a big fight when it comes to water. It is building. And this place is growing here. But we have said that from next year we will not take anyone from the outside any more. It is too small. There is no more land for others - and no more water. Koffiekraal is around 2 900 hectares. Imagine that with the influx of people. Even fifty new people in six months are a challenge. Even with the amnesties we have here, there is so little to share already. When you go to the edges of the villages, there are no [communal] taps. So until municipality extends, they have to fetch from 500 metres away for themselves.

The challenges associated with population growth, largely limited resources and capabilities of the local municipalities and water treatment capacities in combination with generally limited water resources were significant. Aggravating this situation were illegal evictions of long-term farm workers from the commercial farms, which steadily increased the number of inhabitants of Koffiekraal. A new piece of legislation - the Extended Land Tenure Act (ESTA) - issued a claimable property right to farm labourers, who had lived on the property of a commercial farmer for a certain period of time. They were legally entitled to claim the often small piece of land around 15 - 50 square meters (on properties comprising sometimes 50 - 400 hectares in total) on which they had spent their whole life while working for the large-scale farmer. However, the ESTA was seen by commercial farmers as a threat to their land ownership (CF C, March 2011). This caused many white farmers throughout South Africa to illegally and often forcefully evict the life-long farm workers from their premises, often without payment for the last months of work (EFs b1, November 2015, Koffiekraal). This was a phenomenon widely reported on in South Africa in critical academic circles, but at the same time one of the less publicly addressed (Cousins 2009). The legislation anticipated to provide security to poor farm workers livelihoods in terms of housing was not enforced; the local police did not act.

6.1.5 HUMAN AND NATURAL CAPITAL

A lack of food, water and functioning sanitation devices was prevalent in the rural villages in the study area. Many of the inhabitants suffered from malnutrition and thirst. Small backyard food gardens existed with a size not larger than 0.1 - 0.3 hectares in the rural villages visited. These small scale backyard gardening helped to augment food supplies with spinach and beetroot for example, but most of the inhabitants expressed to be constantly hungry. Two or three small cups of water and two small cups of rooibos tea was the normal amount of liquid people consumed during one day in summer (Member of Koffiekraal village, January 2016 Koffiekraal). After the beginning of summer (in around September) to the end of the irrigation period in around February the water table usually dropped below the level of the municipal pumps. As a result, the municipal water pumps did not reach the ground water table anymore and village of Koffiekraal and parts of Skuinsdrift had to be supplied by tankers, which however did not come regularly and “sometimes there is no water for two days or more” (ibid.).

Food supply was not sufficient in the villages due to a shortage of water. “No, it is not enough. We also have to buy stuff. We don’t sell normally, this is a family garden, it’s for the family. But our problem here is water, too little water” (Small-scale farmer in Koffiekraal, January 2016, Koffiekraal).



Picture 11: Food gardens in Koffiekraal

In terms of knowledge about the institutional water governance approach, I have found it to be very limited in the rural villages in the study area. None of the participants had knowledge about the NWA 1998, the NWRS 2, the NWPR 2013 or any other current or future policies, plans or strategies of water governance in the area. Participants possessed no knowledge about the process of WUA establishment in the Groot Marico area. The tribal leader in Koffiekraal had heard about it, but had no knowledge about its meaning or about the roles, responsibilities and powers a potential WUA would have had regarding water access and control. As such, none of the participants possessed knowledge about the political vision behind WUAs anticipated as a mechanism to transform water access and control specifically for the previously disadvantaged. The existence of an official water licence of Existing Lawful Use (Schedule 4 water entitlement, NWA 1998) was not known to them. No official of national Department of Water and Sanitation, the local office or the regional office of DWS had ever visited Koffiekraal to explain the institutional system of water governance to them. The access to information in the absence of electronic means of information and communication technology like any form of computers, smartphones with an internet connection, was largely

limited. The absence of means of transport or money to pay for the local taxis, and a lack of social contacts to knowledgeable people was also evident. This also refers to knowledge about the municipal structures and boundaries.

With 84 % the Setswana language was the main spoken language in all villages and settlements (ibid.). The Afrikaans language was mostly understood by the population of the rural villages, but was spoken on a basic level, as was the English language. Literacy was largely limited and 50 to 60 % of the participants of this study could not write their own name. All respondents had only limited or no formal education, none above Grade 3. Two people were able to read English. Reading legal texts (such as the National Water Act I handed out to them) they described as 'very difficult'.

6.1.6 ECONOMIC, FINANCIAL AND PHYSICAL CAPITAL

The area covering the former Crocodile (West) - Marico Water Management Area, which is now part of the Limpopo WMA, is among the most populated of all the WMAs in South Africa with a population of around 6, 7 million people. Most of them lived in the urban centres of Johannesburg and Pretoria (Tshwane) in the Upper Crocodile and Apies/Pienaars sub areas, attracted by employment opportunities (DEAT 2005). As a result, informal settlements emerged on the periphery of most of these epicentres of economic activity (ibid.).

Economic development had a high priority in CWM-WMA as the area is of great importance for the nation's economy (WSGD 2008; National Water Sector Program 2007). Overall, 25 % of South Africa's GDP originated in the former Crocodile (West) - Marico WMA. This constituted the biggest share of the country's economic output of all WMAs (DWA 2004). Besides the mining sector with a contribution of around nine per cent mostly coming from the activities in and around Rustenburg, Bafokeng and Madibeng areas, manufacturing (22,7 %), agriculture (18,7 %), transport (15,7 %) and finance (17,7 %) were major contributors to the region's Gross Geographic Product (GGP)⁷⁸ of R 130 billion in 1997 (DEAT 2005; Tempelhof 2014).

However, the economic output generated fell mostly upon the economic centres of Johannesburg and Pretoria. In the study area, besides large-scale irrigated agriculture, no other economic sectors were present with the potential to create more than a handful of jobs. However, local economic activities of small-scale agriculture, local barbershops, cutting and selling firewood, small bars or traditional beer breweries were present. Self-help systems of exchanging a meal for some hours of work, or simply helping each other without reward were common among the people of Koffiekraal and Skuinsdrift.

⁷⁸ GGP represents the total value of all final goods and produced services in a geographic area within a certain period of time.

Despite the economic importance of the area, social and economic developments have been limited for the urban and especially the rural poor and only small changes in social and economic development were observed (ibid.) for rural areas in the last 15 years. A research interviewee from the University of Cape Town with a research focus on water and poverty described: “I would say that 50 to 60 per cent of the people of this country are poor, and almost all of them are black and rural.” This pointed formulation is supported by official numbers about national socioeconomic development, as do the findings of this research (DEAT 2005; Nicolau 2014).

However, in the study area the poverty gap grew faster than any economic development could strive to bring employment opportunities. Poor households have not shared the benefits of economic growth. In the Northwest Province, in which most of the Crocodile (West) - Marico WMA is located, 52% of the people lived in poverty⁷⁹ according to official statistics (Human Sciences Research Council 2004 (ibid.).

Figure 15 below illustrates that water resources are limited in exactly those areas, in which many local livelihoods and economic activities depend on them (Muller et al. 2009).

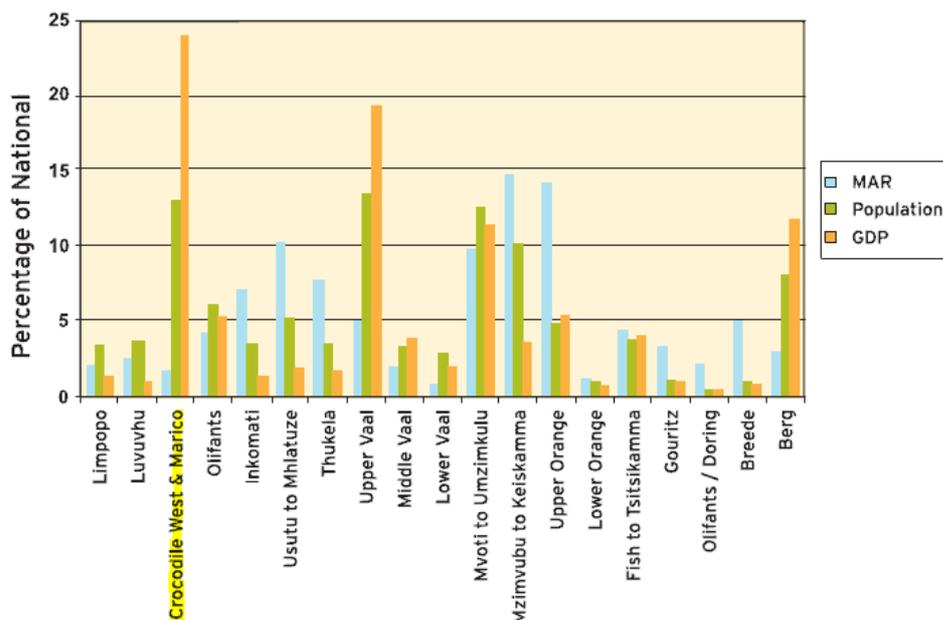


Figure 15: Mean annual runoff compared to population and economic output (GDP) (Muller et al. 2009)

⁷⁹ Poverty estimates in the report of Human Sciences Research Council 2004 were calculated using a poverty line that varies according to household size. A household of four persons has a poverty income of R 1 290 per month (around 120 AUD). That was R 322 per person per month in times where a litre of milk costed around R 22 in the local supermarkets. The R 322 per person (approximately 30 AUD) per month was even below the food poverty line of South Africa of R 344. It describes the amount of money needed to satisfy the most basic daily energy requirements of a person (NWP Financial Report 2013).

The areas with the highest GDP contribution are the ones with the lowest endowments in terms of mean annual runoff. This makes an efficient management of the existing water resources imperative. However, on municipal level the resources and capabilities to do so were limited. In many cases the municipalities mandated with water supply and sanitation were not capacitated for the task and often lacked skilled personal while operation and maintenance suffered from a very limited financial budget.

The Marico River, for example, once the most pristine river in the whole country (DEAT 2004), had become polluted as a result of limited financial means, municipal mismanagement at the old and ailing water treatment plants in Groot Marico and Zeerust and through improper planning for sanitation devices and the uncontrolled transport of sewage to treatment plants. The Groot Marico treatment plant was built in the 1960s. Clarification techniques included one settlement tank, a screening grid and a sedimentation tank. After that the only technique used to treat the raw sewage was the dosing of chlorine in large amounts. The operator of the local treatment plant explained (January 2016, Groot Marico): “If we find the nasty stuffs, then we just dose more chlorine.” He continued: “I am the local water plant operator. We have very low capacities there. The RDP houses [from the settlement which emerged in between 2011 and 2016], jo, we struggle. Every four hours we have to pump out the sewage and bring it to Zeerust. The external contractor for the emptying was on site yesterday, but we struggle to get the money back from the DWS and sometimes we don’t have [money].”

This led to a situation in which the Zeerust and the small Groot Marico WWTP did not have sufficient amounts of chlorine to treat the raw sewage, due a lack of funds (SABC News of 2017). It was discharged untreated into the river. In 2011, this problem was already known to the Groot Marico municipality, as well as the inadequacy of treating raw sewage with chlorine before pumping it to the rural villages of Koffiekraal, where the research participants complained about stomach problems. I found large chlorine residues in every kettle in every household visited, where the bottom of the kettle filled up with chlorine residues after a week. In 2015, this problem had magnified to become a severe threat to the drinking water supply of Groot Marico and jeopardized the health and livelihoods of the communities downstream, especially Koffiekraal (Member Koffiekraal traditional council, November 2015).

However, the people living in Koffiekraal and the surrounding villages faced a daily struggle for water and food. Hunger was a major livelihood challenge and food sources were limited. Water was supplied to the communities into two large municipal storage tanks. The inhabitants used this for multiple purposes of drinking, sanitation and hygiene purposes and for water cattle and food gardens alike. Participant’s mental well-being and bodily health were generally in a better state than in the settlements of the Hex Valley. However, a limited food supply was evident in all the villages, but hunger was not as prevalent as in the settlements of the Hex River Valley, because the small-scale food gardens in the communities provided fresh vegetables such as spinach, beetroot and cabbages. Furthermore, poor health conditions existed in the rural villages due to lack of affordable medication, medical services and long distances to the next hospital. Access to hospital and or ambulance services in case of emergencies were described as too expensive in general. Stomach

problems, diarrhoea and a general feeling of constant fatigue were prevalent. High mortality rates among all ages were evident (see also Nicolau 2013). Funerals happened daily.

The physical assets of the community, were largely limited. None of the research participants had a computer, tablet, or smart-phone with internet access. None of the participants had any private means of transport. A lack of transportation inhibited the potential marketing of agricultural products on local markets, should a surplus of fresh produce for sale exist. Access to official authorities, for example driving to the local DWS office near the MBD, or the supermarkets was very limited, and so was access to food, besides what the local food gardens produced. The local DWS office for example was located in 40 Km distance from Koffiekraal, the next larger supermarket in 20 Km distance and mobile food vendors did not exist. Small local 'tuck shops' provided the basic supplies for cooking such as oils, toasted white bread, milk, oats, butter and washing powder. But even if it would have been in close proximity, the tribal leader explained (November 2015, Koffiekraal): "I can't afford the oats, I eat what we have here, sorghum mostly." With slight local differences, I have found these conditions in all the villages visited during this study in the Groot Marico catchment. In the rural villages, a prevalent lack of transportation meant significantly inhibiting the mobility of participants from all settlements and with that their access to hospitals, medication and local authorities.

However, besides two emerging farmers from Skuinsdrift, two interview participants from the group of emerging farmers also came from the rural town of Groot Marico. The Groot Marico Community Fresh Produce Project (GMFP) was initiated by the Department of Social Development in around 2005 in Groot Marico. Funds had been paid irregularly and the Department of Rural Development and Land Reform continued the project in 2016. About 12 hectares were planted, mostly with maize, pumpkin, sweet potatoes and sweet melons.



Picture 12: Two emerging farmers in front of their fields of the GMFP in 2016

Although the two emerging farmers in the picture above were not connected to the MBIS, they abstracted water from the River and were thus an affected party of any governance processes concerning the health of the Marico River. However, they were farming on the property of the

Department of Rural Development and Land Reform development project and had received a government grant (of around R15 000) for agricultural supplies and equipment. However, they had no formal license to abstract water and the two emerging farmers diverted water from the Marico River onto their fields illegally. This was common practice along the Groot Marico River, but more so among commercial farmers, as they had sufficient financial means to install and run pumps. As can be seen from picture above and below, the two emerging farmers dug trenches to abstract water from the River and diverted it onto their fields by shovel and hand.



Picture 13: Trenches diverting river water



Picture 14: Emerging farmers and local helpers of GMFP project repairing their truck

The two emerging farmers, together with other helpers of GMFP and local people helping voluntarily, cultivated cabbage, beetroot and spinach selling it to the local population. They also had started growing chillies as a cash crop to be sold in Koster. The project had bought a truck through a government grant, but the financing of spare parts provided a constant challenge.

However, for all rural communities visited and for the people engaged in the GMFP alike, largely limited water availability was their main concern regarding their livelihoods (please see the contextual overview tables in Appendix 3 for more detailed findings on the livelihoods of each of the three water user groups).



Picture 15: Food gardens with micro-jet sprinklers on the Quiet Living farm of the MRDP

Contrasting this, commercial farmers described their livelihood situation as “stable” and none of the participants or any member of their family faced any immediate existential risk. The commercial farmers in the study area followed an economic strategy of diversification of their businesses, having alternative economic options and the financial means to pursue them. Commercial farmer CF C for example, besides owning 250 hectares of fully developed vegetable, grain and tobacco farming, invested in the transport sector owning considerable shares in South African trucking companies (Commercial farmer CF C, November 2015, Skuinisdrift). CF B was actively pursuing a strategy of buying additional land under the MBIS and searching for opportunities to invest in the retail market in the Western Cape. CF A owned shares in two transport companies and had invested “in some agricultural projects near the Orange River” (CF C, March 2011, Lekkerbreek). All participants had already diversified their crop variety to better buffer for shocks such as a failed harvest or a limited yield in one year.



Picture 16: Large-scale irrigation with centre pivot sprinklers near Skuinisdrift

Overall, this was possible due to the availability of sufficient agential power to explore alternative economic routes. Additionally, all participants from the group of commercial farmers had contacts to other people active in other economic sectors; to knowledgeable people through their membership in agricultural organisations such as AgriSA and their local chapters; they had access to finance through the Landbank, through private banks and also through the Development Bank of South Africa (DBSA); they had the mental and bodily strength to engage in such activities and the support of family members, who did not have to worry about basic necessities of life such as water and food supply; all participants were able to afford health care and tertiary education for their children; all participants possessed means of information and communication technology to obtain knowledge. All participants possessed the physical means of transport and all participants were fluent the English and Afrikaans language.

In terms of practical water access, illegal abstractions were common among all water users, either from the River or through illegal boreholes. In 2008 for example, a commercial farmer on the farm of 'Haakdoorenbolt' next to the community of Koffiekraal, had simply slowed down the flow of the Marico River by constructing a small and partial dam out of large stones and installed a water pump. This resulted in a fight with the traditional inhabitants of the area, because they relied on the Marico for watering their fields and cattle in times where the municipal sources had run dry during summer. Members of the community then disabled the pump.

6.1.7 PHYSICAL AND NATURAL CAPITAL: LAND OWNERSHIP AND WATER INFRASTRUCTURE

The Marico Bosveld Irrigation Scheme (MBIS) constructed in the 1960s was supplied with water from the two rain - and river fed Marico Bosveld and Kromellenboog dam. The system of open concrete canals was constructed by the grandfathers of the current commercial farmers and supplied around 48 commercial farmers north of the MBD towards the rural village of Koffiekraal.

The major water user in the study area was the commercial irrigation sector. Contributing only 9% to the gross geographic product of the area, it used 70% of the available surface water. In the graphic below international requirements refer to the amount that the South African government transferred to the Gaborone dam in Botswana as part of their transboundary water agreement.

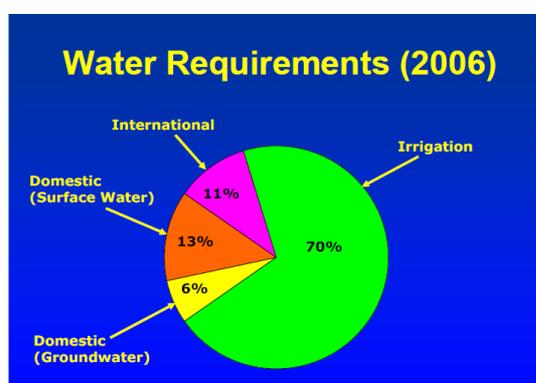


Figure 16: Water requirements in the former CWM-WMA (DWS n.d.)

Overall, the water infrastructure in the WMA was mostly old and ailing (Turton et al. 2003). Due to high evaporation losses in the open channel irrigation systems, delivery efficiency was largely limited (ibid). The sheer age of the canals, but moreover inadequate maintenance of the canal infrastructure resulted in up to 40 - 50 % losses of water released from the MBD through the system of open canals (Crocodile River West ISP 2004; DEAT 2005). "Our water losses are immense. It was always beneath 20 %, but it is much more now. I would say around 40% maybe or more." (CF C, November 2015, Skuinsdrift). The operator of Groot Marico WWTP explained: "The leakages and cracks in the canals cause a loss of water. It is high, maybe up to 50%" (February 2016, Groot Marico).



Picture 17: Open canals in Skuinsdrift

The system of canals ended right before the village boundaries of Koffiekraal and the access point and diversion box from the canals to the Marico River had been disabled over ten years ago. The community suspected commercial farmers CF B behind this, but they had no proof (Community leader tribal council, June 2015, Koffiekraal). The last commercial farmer before Koffiekraal was participant CF B on his farm of around 50 hectares.

The commercial farmers under the MBIS paid a maintenance and operation fee to the DWS, which included, in principle, the cleaning of the canals and their refurbishment. However, in practice the local farmers relying on their own expertise, equipment and manpower conducted the cleaning. They also paid a CMA fee with the water bill,⁸⁰ although a CMA had never been established. The commercial farmers ordered their irrigation water from the local DWS office, which was legally required to be of a certain quality (NWA 1998). However, the canal system was not maintained by the DWS since the year 2000 and the water quality was deteriorating.

⁸⁰ None of the interviewed farmers was willing to disclose his water bills to me; the officials from DWS also refused to show me a water bill of a commercial farmer due to understandable privacy concerns.

On these grounds the commercial farmers were engaged in a law suit against the DWS, suing the government for not having fulfilled their duties, for which the farmers had already paid. This lawsuit furthermore referred to the pollution of the Marico River with raw sewage from the Groot Marico and Zeerust WWTP and to a lack of maintenance and investment into the treatment facilities. An interim interdict was issued in favour of the commercial farmers by the Northwest Provincial High Court (NWPDF 2015). An interdict is a court order that might be sought in order to enforce a right. In this case it referred to the right to use water for irrigation purposes from Schedule 4 licenses of Existing Lawful Use, the right to receive maintenance services already paid for and the non-establishment of a regional CMA. On the legal grounds of the interdict commercial farmers under the MBIS have collectively stopped paying for their irrigation water under new and historical licenses, while successfully disputing their factually incorrect water bills.

However, regarding land ownership in the study area was dominated through land owned as private property. The green areas in Figure 17 below in the Marico municipal boundaries⁸¹ show that except some pockets of state land the entire area was privately owned. In 2004, no land was owned by the black communities, the traditional occupants of this land. The major commercial land uses were irrigated agriculture, cattle and game farming. This was still the situation in 2011 during my first research visits to the broader Groot- Marico catchment (Förster et al. 2017).

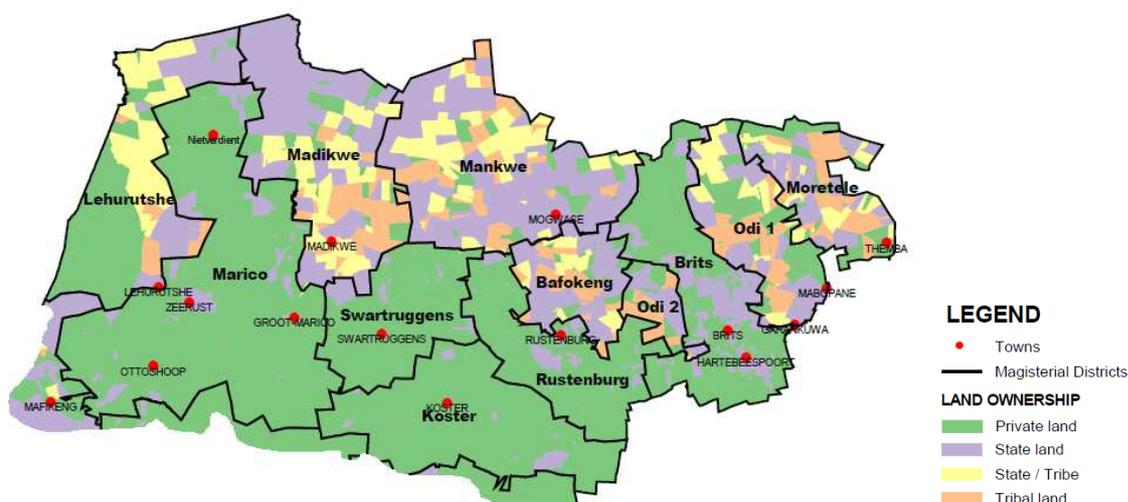


Figure 17: Land ownership in the Northwest Province (DWA 2004b)

CF C explained (November 2015, Straatsdrift): “We are 48 commercial farmers under this irrigation scheme. And then its Pella and Brakuil that now got land over here. The blacks have over 400 hectares now.” Overall, the large majority of the land was still owned by commercial farmers, which used every opportunity to buy more land and maintain their influence over land resources and with it over the historical water allocations. Eighty per cent of the water (approx. 30 million cbm) in the two dams was allocated as ELU to commercial irrigators under the Marico Bosveld irrigation scheme

⁸¹ The Municipal Systems Act was enacted in 2004 introducing the current municipal structure.

(DWS regional manager, March 2016 Groot Marico). The rest was for transboundary transfers to Botswana. This seemed a large amount of water, but considering 40 - 50 % losses in the cracked open canals this appears a reasonable number as compared to the water use in the Hex Valley.

Commercial farmer CF B explained how buying land upstream would help to get access to water: "We also buy land upstream to get the water and then use the river as a conveyer system to get the water. You are allowed to transfer water amongst your properties." Again, a goal of the NWA 1998 had been to separate land ownership and water access. Trading water was supposed to be regulated by the DWS in a central trading system, but it was not implemented. A law suit in the Western Cape was won by a commercial farmer against the government and soon all commercial farmers knew about this verdict and copied the practice of trading water privately (Senior manager Breede-Gouritz CMA, September 2014, Worcester).

However, in 2015 the situation of land ownership had changed. Around 400 of the 2 700 hectares under irrigation with water from the Mario Bosveld Dam were legally given to the traditional owners of the Setswana people. This was due to successfully reclaiming the land of their ancestors using the formal, legal mechanism of the Restitution of Land Rights Act 1994 (PMG 2016).

By forming a Community Property Association (CPA), comprising the traditional owners scattered throughout the rural villages of Koffiekraal, Brakuil, Uitkyk and Pella, the traditional inhabitants pooled their knowledge and negotiating power. Support in terms of knowledge and legal expertise and means of transport and communication came from the University of South Africa and local activists. Forming the CPA was a legal requirement of the Restitution of Land Rights Act 1994 and the Setswana and Hurutse people were able to prove through oral history contained in stories, songs, poems and other narratives that their claim around 400 hectares of land was valid. The location of the ancient graveyards of their ancestors was an important cultural and spiritual site for local people, but were locked up behind the fences of privately owned commercial farms for one hundred years.

However, a counter strategy of the commercial farmers was not long to be waited upon. Similar to the Hex Valley commercial farmers, the (also exclusively white) commercial farmers in the Groot Marico area sold property amongst themselves rather than on real estate markets to maintain in control of the attached water resources per hectare and to exclude emerging farmers potentially accessing both, land and water. But they also put in land claims for the same land that the rural communities were claiming in order to slow down or block the government efforts and to have an argument for a potential law suit.

Commercial farmer CF B specified this (November 2015, Groot Marico):

If we had started to oppose their land claims, prior to when we did, nobody would have gotten any land. But we were under the impression that it was only a few of those farms. But then we realised it is a whole area. So we came together and started the Marico district land forum to oppose their claims. Then it stopped. Because the history is clear, their claims are not valid (...). Now we are putting in claims ourselves, because I was also deprived of my land in 1980 when they gave it to the Setswana.

However, by the time commercial farmers put in their claims, the 450 hectares connected to the Marico Bosveld irrigation scheme had been given to the traditional owners of the land. One of the farms was previously owned by CF A. A financial compensation had been paid

Figure 18 below depicts this through black lines around the property boundaries. However, it was not a coherent area and stretches of land (on the area previously the Skuinsdrift farm) still belonged to CF A, so that a remainder of his farm was now adjacent to the emerging farmers land.

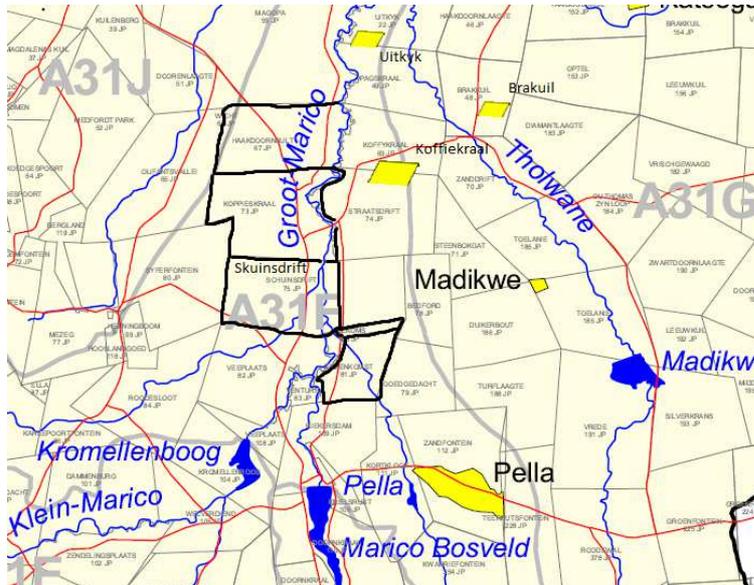


Figure 18: Areas of claims of traditional communities in black (the name of the farms are Hakdoorenbolt, Koppieskraal, Skuinsdrift and part of Zamekomst)

Nevertheless, on the traditionally claimed land a number of emerging farmers tried to make a living out of farming and aspired to gradually enter the commercial agricultural sector from 2013 onwards. This never happened, The reasons for this will be revisited again in sub-chapter three. However, for the rural communities the Restitution and Land Claims Act, in effect, presented the formal mechanism to access water in the study area by accessing land.

However, the Marico River was used by the inhabitants of the town of Groot Marico and the rural villages of Koffiekraal and Skuinsdrift to augment their water supply for multiple livelihood purposes. For the traditional community of Koffiekraal the river however was of vital importance as in times of drought during the hot summer months from September until February.

Participants described that water tankers would deliver water irregularly. During this there would be no water for watering crops or animals, “just for drinking” (Tribal leader of Koffiekraal community, January 2015, Koffiekraal). Groundwater wells and the mechanical pumps in Koffiekraal used from 2004 to 2009 were closed by a municipal official. The village representatives were told

that the groundwater would be polluted and not safe for drinking. Further explanations⁸² were not given.



Picture 18: Communal tap in Koffiekraal

However, besides buying land as a strategy to access water, water users in the Groot Marico catchment used the formal mechanism of water governance -the local DWS office- to obtain water. In order to receive it from the MBD operated by the DWS local office, each of the farmers (whether white commercial or black emerging) was required to fill out a handwritten form in the office to order a certain amount of water a week in advance. This was delivered during the day or during the night. Staff of the local DWS office opened and closed the sluices along the canals and at the farm property of the respective farmer. The connections were metered and were read out by staff of the local office. The local office then submitted the water use information to the billing branch of the DWS on a monthly basis. These readings were the foundation, on which the water users were billed by the national DWS.

Commercial farmer CF C (November 2015, Groot Marico) described it in the following way:

You order your water from the scheme on Thursday this week for Thursday next week. So you have to check on your weather forecast and plan a week ahead on what your usages will be and order the water. If you then receive the water, your irrigation dams are full. But you cannot stop the water; they open your sluices, the water will come whatever. You can't call them and tell them to close the water for the day, because they need a constant outflow of the dam. What I did, I made my three on- farm dams a bit bigger. So that helps, but not much.

Commercial farmers interviewed for this research received water through the system of open irrigation canals and also had one to three boreholes for groundwater abstractions. If the farm was located next to the River they also abstracted water directly from the stream, mostly illegally.

As such, in order to receive water for irrigation purposes a formal water entitlement was required. As this water was tied to the owner of the land for emerging farmers the situation of accessing water

⁸² However, due to limited sanitation devices with connection to the sewers, the village members of around 10 000 people had used pit latrines for the last 20 years. This is likely to have contributed to the groundwater pollution.

from the MBD was simple: they did not have access to water, if they did not own land. The same was true for the rural communities of Koffiekraal, which in theory could be connected to the irrigation scheme, because the last irrigation channel of the MBIS ended right before the village of Koffiekraal. The weir and the diversion box, which, in principle, could supply irrigation water to Koffiekraal had been destroyed around ten years ago. As a result, the last off-take was now located on the last farm connected to the irrigation scheme before Koffiekraal - this farm belonged to commercial farmer CF B.

The second head of the Madikwe Rural Development Project development explained (Development worker in MRDP, who lived on the Quiet Living farm in Skuinsdrift for the last 20 years, November 2016 Skuinsdrift): “The last meter of the canal ends before Koffiekraal. If there is water left in the canals, which happens only in good times, then the water goes back into the River. Theoretically, they could use this productive water, because Koffiekraal has only poor borehole water, but they are not allowed.”

The lack of access to water for productive purposes from the MBD and due to lack of access to borehole water, the small-scale subsistence farmers in Koffiekraal mostly fetched water from the two storage tanks or the supplied communal taps and transported it in containers of around 25 litres to their small fields. Some used old bicycles or old donkey carts, but most of the people used two plastic containers of around 25 litres walking back and forth between the water source and his fields located in 200 to 500 metres distance.

I am fetching the water from communal taps and that is difficult. I water once a week or twice, depending on rain. The challenge here is water. We rely on the rain, despite the dam. So, with no good rain, I go 40 times on two days a week or so to fetch the water with this container here to the tanks. Then we grow something to put on the plate. But others in the community they complain about me, because they say I am is fetching the water from others to drink for and we fight (Small-scale subsistence farmer in Koffiekraal, June 2015).

The lack of access to sufficient amounts of water for their livelihood purposes caused social tensions amongst the inhabitants of Koffiekraal. Especially during the time of September to January (the hot summer months) water supply to the two storage tanks decreased steadily. The Moses Kotane municipality told the village that this was due to fact that the ground water table would sink below the level of municipal pumps. Interestingly, this was also the peak of the irrigation period during which commercial farmers used the most water from surface and groundwater for large-scale irrigation from the boreholes on their property (Commercial farmer CF C, B November 2015 Straatsdrift).

However, depending on summer rainfall patterns, this meant that the small scale farmers in Koffiekraal had no water for livelihood purposes at all, in case the water trucks would not arrive. Participants described this would happen frequently:

Sometimes they don't come for one day or two. Then we have to go to the River. But the river it is not clean anymore, so what must we do then? During this period it is very bad here my friend, very bad. Sometimes the water comes with tankers and we must line up here with the

buckets and containers. We must also go to the river then. But sometimes there is also nothing left in the river, you see,

said the tribal leader of Koffiekraal (June 2015, Koffiekraal).



Picture 19: Two water storage tanks in Koffiekraal as the only water supply connected to communal taps

This had negative consequences for the small-scale agriculture activities of the people of Koffiekraal and Skuinsdrift. Cattle or their food gardens could not be watered any more, as the water stored in the two tanks was used for multiple livelihood purposes including sanitation and hygiene, cooking and drinking. In times of interrupted water supply, notably with summer temperatures of above 35 degrees Celsius, life in the communities of Koffiekraal was described to come to standstill, while social tensions between water users would increase. Members without a food garden complained about those using water from the two tanks for watering their small fields accusing them of taking water, which others needed for human consumption and household purposes. Koffiekraal had seen physical fights between villagers over water resources as well (pers.obs.; Tribal Council discussions, June 2015, Koffiekraal).

This illustrates that in reality of the poor's livelihoods no distinction existed between water for human consumption or for productive purposes, they simply lacked access water for all kinds of purposes. In contrast, the commercial irrigators and their families enjoyed receiving water for irrigation purposes from the MBD while having sufficient borehole water for their drinking and sanitation purposes, as well as for augmenting their irrigation water during the summer. Their agential power to access water was evidently greater than those of the other players of the water governance game in Groot Marico.

However, after the successful land claims of the black communities this situation had slightly changed for a handful of emerging farmers. On paper, they now owned the land and had formal access to water from the dam. For the large majority of people from the rural villages, however, access to water for their livelihood purposes was very limited.

However, it was within this context that the establishment of the Marico Bosveld WUA was initiated in 2005. Social processes in and around the meeting are analysed in the following according to the TARPCO criteria.

6.2. OF RULES AND GAMES

TARPCO ANALYSIS OF PROCESSES INVOLVED IN ESTABLISHING THE MARICO BOSVELD WATER USER ASSOCIATION

The normative political visions of the South African government had been to radically change water access and control for those previously marginalised (DWS 2013). In the analysis of the results of the first case study I have argued that the establishment of the Hex Valley WUA had entrenched the privileged access and especially the control of water by white commercial farmers in everyday practices, rather than changing them.

Interesting questions for the second case thus involved: how has the initial vision 'played out' in study area 2 and through which formal access mechanism do the three water user groups access water for economic purposes in the absence of a WUA?

In the following, I thus apply the TARPCO categories to analyse socio-political processes of water access and control manifested in the final establishment meeting for the Marico Bosveld Water User Association (MBWUA). However, as with all analytic categories, they overlap in practice. As such, the findings are presented and discussed below in pairs of categories, similar to the way I have used them for the analysis of the findings for the first case. However, I start by providing an analytic narrative of an official meeting between water users and representatives from the DWS for the establishment of the Marico Bosveld WUA, which took place in mid-2011 at a location called Lekkerbrek. This house built and owned by commercial farmers, it had a meeting room and lounge overlooking the Marico Bosveld dam. This meeting was supposed to be the final meeting before the WUA proposal would be submitted to the Minister.

6.2.1 ANALYTIC NARRATIVE OF A WUA ESTABLISHMENT MEETING

Besides twenty white commercial irrigation farmers, two officials from the national DWS and two officials from the regional office, who were supposed to facilitate the meeting, only three small-scale farmers from Skuinsdrift were present and no representatives of the local, rural communities attended. During field interviews with small-scale subsistence farmers as members of local communities and local emerging farmers, they expressed their interest in becoming members of the new WUA, but they did not attend this meeting, as they had no knowledge of it (Members of Koffiekraal and Skuinsdrift villages; EFs 2 and 4, February and March 2016, Koffiekraal and Skuinsdrift). The invitations to this meeting were sent out via email one day prior to the meeting by the operator of the Marico Bosveld irrigation scheme of the DWS (Commercial farmer CF A, February 2011 Lekkerbrek). People from local communities and emerging farmers might have had an email address, but they did not have the technological means to access their email accounts regularly; in fact, most of them did not know how to use such technology or could not read or write.

The meeting took place at a venue on a hillside overlooking the area, but out of reach of any major taxi route. Local taxis were a vital mode of transport in South Africa, as the country had no public transport system; most of the emerging farmers and members of local communities had no other means of transport. One of the commercial farmers indicated that "the meeting was held there,

because we said so" (Commercial farmer CF B, 2011, Lekkerbrek). In effect, this meeting had been demanded by the commercial farmers of the Marico Bosveld Farmers Association, made up of exclusively commercial farmers. This created a situation in which emerging farmers and members of the local community living in the area of proposed WUA responsibility were not present and thus could not engage in major decisions regarding their representation on the potential MANCO of the WUA that was supposed to be voted for in this finalising meeting. Additionally, they could not engage in the process of discussing the WUAs proposed constitution.

The meeting was held in English and the topics discussed included the hydrological and legal boundaries of the WUA and some other legal and technical details. The language used had thus a legal character concerning statues and paragraphs of the constitution. During the meeting the three emerging farmers openly voiced their concerns of not being able to follow of "what is going on here" (EF 1 2011, Lekkerbrek) due to their limited understanding of the English language, as well as of the matters discussed. This caused the facilitators from the national DWS to conduct a half hour knowledge building session in the mother tongue of the members after the meeting. Therefore, decisions that would affect these emerging farmers' livelihoods were explained to them only *after* the meeting occurred. This was the opposite of what was prescribed by the WUA establishment guidelines of the DWS and the ideas in the NWA and NWRS 2. The spokesman of the commercial farmers dominated the course of events by systematically going through the points on his agenda. However, the constitution of the WUA, as a set of self-imposed constitutive and procedural rules, was never part of the voting agenda and was not debated.

The three small-scale farmers present had no part in writing this constitution, although they were listed in the final document (Commercial farmer CF B, June 2015, Groot Marico; EFs 1-2, November 2015 Koffiekraal). In turn, this constitution would provide the procedural rules for the operation of the WUA, such as becoming a member of the MANCO or the allocation of voting rights. Moreover, when it came to the elections of the MANCO, it became obvious that commercial farmers had already agreed on positions of president, vice-president, and treasurer upfront and were now using their majority vote in attendance to instate them. The meeting was closed by the DWS official with an agreement that the DWS would present the constitution to the Minister of Water Affairs and report back to the spokesperson of the commercial farmers, which was CF A.

This specific scenario is illustrative of asymmetry in agential power to do something. This is despite proper structural and regulatory measures being potentially available for steering the process if used adequately by the facilitators of DWS. Collaboration and engagement were hampered because of enormous differences in the endowment with resources and capabilities to meaningfully engage and influence the 'course of events' during and the circumstances of that meeting. The power asymmetries and their consequences are discussed below in the light of the TARPCO systematic.

6.2.3 TRANSPARENCY

Transparency relates to the availability of information and to the degree of knowledge about something. However, to differentiate between internal transparency and external transparency as I have for the first case study of the Hex Valley WUA makes little sense for this second case, because the Marico Bosveld WUA (MBWUA) was never established. However, the findings below reveal similar patterns of power in processes of establishing a WUA as found in the first case study in the Hex Valley WUA.

On the one hand, none of the participants of the emerging farmers or of the rural communities of mainly Koffiekraal and Skuinsdrift had ever heard about a WUA to be established in their area, nor where they familiar with the concept of water governance through local WUAs. Thus, none of the participants was aware that WUA establishment process had been underway from 2000 until 2013. In effect, none of the small-scale farmers had any knowledge about the content of the National Water Act 1998 or any related piece of water legislation. A member of the tribal council Koffiekraal (Tribal leader of Koffiekraal, March 2011, Koffiekraal) explained that “the government is not briefing us”. Another member of the community with a small food garden explained in relation to water institutions: “I don’t have the knowledge about these things you see” (Traditional council discussions, June 2015, Koffiekraal).

On the other hand, all commercial farmers interviewed for this study were the main figures in the development of the WUA proposal and were the driving force in organising the establishment meetings with DWS to discuss water related issues. For the supposedly final meeting the head of the Marico Bosveld Farmers Association had developed an agenda on a A4 sheet of paper, which I obtained. The headline stated: “Marico Bosveld Interim Water User Association - Agenda of the irrigators meeting”. At that time in March 2011 black ‘irrigators’ in a commercial sense did not exist, which explains who was supposed to sit on the MANCO of the proposed WUA – the commercial irrigators. A commercial farmer (CF B, January 2015 Groot Marico) explained this again after the meeting that it was only the commercial farmers of the Marico Bosveld Farmers Union, who were involved in the process of developing the three proposals of the WUA constitution handed in to the DWS. He said: “It was us, the farmers who started all this.”

Similar to the first case study, transparency had not been created by the DWS officials prior to the last establishment meeting, and not prior to any of the meetings the commercial farmers had throughout the course of 12 years and during this meeting. I could also reveal that the regional office had asked the commercial farmers to transport the three small scale farmers to the meeting narrated above, as the regional office lacked sufficient funds to do so (Senior manager at DWS, formerly involved in the MBWUA establishment process, March 2016, Pretoria). This, however, stood in stark contrast to the opulent buffet that was served after the meeting was closed (pers. obs. 2011).

6.2.4 ACCOUNTABILITY AND CONTROL

One component of accountability relates to the existence and efficacy of external bodies of control which monitor the activities of water institutions and the outcomes of their operation (Carloni and Crowley 2005). In the analysis of the Hex Valley WUA, I differentiated between external and internal accountability. However, the WUA in the Groot Marico case was never established and I thus analyse relevant aspects of the establishment process using only accountability characterised by answerability and enforceability.

One of the meetings supposedly finalising the MBWUA establishment took place in 2011 as narrated above. The broader process had however started in the early 2000s on the initiative of a few commercial farmers organised in the Marico Bosveld Farmers Union. They developed three proposals for the MBWUA, which were all rejected by the DWS for a lack of participation and representation of other water users in the process. However, the analytic narrative of the meeting already showed similar power asymmetries between commercial farmers and small-scale farmers from local communities. However, the question still remained, why was the WUA never established? This will be answered in the following sections.

The most important piece of legislation for WUA operation in general was the Constitution of the WUA. However, in the Groot Marico catchment the Constitution was developed by commercial farmers, excluding the emerging farmers and the small-scale farmers from the rural settlements. The regional DWS office in Mafikeng responsible for coordinating and facilitating the establishment process in the Marico catchment had neither sufficient financial or human capacity to fulfil the task of facilitating the establishment process, as it had a staff of only two people - the head of office and a secretary (Senior manager at DWS, formerly involved in the MBWUA establishment process, March 2016, Pretoria). Capacity building and fostering participation of former disadvantaged communities before or during this meeting did not happen. The promised capacity building after the meeting narrated above turned out to be a 10 minute conversation about the MBWUA between the DWS offices and the small-scale farmers.

Prior to this meeting, nobody of the regional DWS office had ever visited the community of roughly 10 000 people in Koffiekraal. The head of this office was well known and well connected with the white farmers under the irrigation scheme, but he was not known to the leaders of the rural villages. Village elders of the tribal council in Koffiekraal were given a mobile telephone number from one of the municipal water supervisors in case the water supply would be disrupted, which sometimes happened several times within three months. I tried to phone the supervisor, but could not reach through for a more than a week.

However, this clearly indicated that fostering community participation could not be fulfilled by regional offices of the DWS, due to a lack of financial and human capacity. The meetings for the development of this proposal prior to this meeting were conducted exclusively by commercial farmers and were only facilitated by DWS officials on only few occasions: "Some of the meetings were facilitated by the Department, but rather when we needed their input. So we invited them" (CF C, February 2016, Skuinsdrift). In terms of accountability and control in the process of developing the WUA establishment proposal, this rather presents the opposite of what was anticipated by

policy and law, especially by the WUA establishment guidelines of the DWS. However, those guidelines were literally just guidelines, but not binding regulations that have to be complied with. As a commercial farmer has put: “They are guidelines, correct? Not laws” (CF C, February 2015, Groot Marico). It would have been the task of the DWS facilitators to explain the National Water Act 1998 and to conduct the meeting in a proper manner, which takes into account the poverty levels and the familiarity of the people with the topic, as demanded by policy and law. This had not happened and the commercial farmers were allowed to dominate the ‘course of events’ of this meeting.

It became clear that the drivers of the process CF A, B, C and other local farmers had excluded the poor and (historically) disadvantaged from the process of developing the WUA proposal. CF A, B and C - with different words - explained that engaging the poor subsistence farmers would have only slowed down the process.

The big problem is communication. The meetings [for the development of the WUA proposal] are in English or Afrikaans. They [the poor black people] don't understand and that delays the whole process; that is the problem with all these black people. They must be helpful in the process. If they don't understand the procedures, they are just sitting ducks, but they are not helping, so why put them there? (Commercial farmer CF C, November 2016, Skuinsdrift).

Further into the interview, I came back to this point and asked the farmer whether they or the DWS had introduced a translator to the process. He answered: “A translator was not there. We had an agreement that if someone doesn't understand, he must ask” (ibid.). These two statements are surely contradictory. On the one hand, he said they would not understand the language properly which would slow down the whole process, but on the other hand a translator was never present.

With regards to water access and control and commenting on the resources and capabilities of the staff of national and regional DWS, the regional water manager said (DWS regional manager, November 2015, Groot Marico): “Those drafting the policy at head office, have no freaking clue about what is happening in the field, they don't know the local. They can't even fill the empty posts for control. And then they wonder it doesn't work in practice.”

6.2.3 REPRESENTATION AND PARTICIPATION: WHOSE AGENDA IS IT?

In the absence of a CMA, DWS can transfer competencies of water management to WUA's and since the inception of the National Water Act 1998 over 90 WUAs have been established in the country.

This process entails some serious shortfalls, which will be analysed and discussed in the following sections. However, at this stage it seems useful to briefly recall some of the findings from the Hex River Valley case. The CMA establishment process in the Hex Valley was explained by the research participants as a participatory and very helpful activity offering knowledge and networking opportunities. The CMA and DWS paid for transport, accommodation and meals of rural people, had capacity building meetings three days prior to the stakeholder meetings and even commercial farmers involved gave a positive account of the process. These meetings and workshops took place labelled as Catchment Management Forums. However, contrary to this, the process of establishing a WUA was described as a "clinical and cold paper exercise" (Ex board member of Breede-Gouritz CMA, September 2014, Wolseley) and as not participatory at all, but rather exclusive to white commercial farmers.

However, for the establishment process of the MBWUA commercial farmer CF B explained the planning process for the MBWUA and the development of the WUA Constitution (CF B, February 2016 - Local farmers bar in between Groot Marico and Koffiekraal): "Only irrigators would be on the Board of the WUA as per proposal, so no people from whatever village. But we are over-allocated [in the catchment] anyhow, so there is no more new water available. So if you want water, you have to buy a farm under an irrigation scheme".

The small-scale subsistence farmers from the rural villages were thus not included in the process of developing the WUA proposal. Commercial farmer CF C (November 2015, Straatsdrift) explained the process of developing the proposal of the MBWUA:

We farmers started the process. We had elections amongst the farmers. When it started we had the farmers union - Boere vereniging [Boer association] - and among other committees, we also have a water committee. And out of that water committee all the farmers selected other farmers as members of the WUA.

Another mechanism for poor communities to participate in water governance was the ward committee. Every municipality is divided into wards with a mandated ward councillor. Ward committees are in theory responsible for public involvement, communication between municipalities and other ward committees as well as for capacity building in local communities (Made 2008). The CEO of the Orange Riet WUA, who had worked for and with the government during the last 15 years explained (February 2015, Johannesburg):

An easy way out would be the representation of the poor in the settlements through the municipal representative, the ward councillor. Now that one is elected, and represents his people on the Board. But however, from my 20 years of experience is that often municipalities are overburdened and there is not one effective municipal councillor that I have met, sorry to say, but that's the truth. I say there needs to be a municipal councillor and municipal manager on the Board.

But in practice of 2016, the elected ward councillor was not even known in Koffiekraal. In Skuinsdrift he was known, but was described as not fulfilling his duties, drinking and not being adequately trained and skilled in the first place. In Koffiekraal this function was essentially taken over by the traditional council and its administrative secretary. The community leader of Skuinsdrift explained that he attended one meeting with commercial farmers and DWS officials in which he heard about the MBWUA. However, he said that he had heard about the meeting by chance, overhearing a conversation at the regional offices and had never been to any other meetings.

6.2.4 COLLABORATION

The idea of the legal and policy structures of NWA and the NWPR 2 was to foster “an atmosphere of joint decision-making” in the WUA establishment meetings. During this research, I have not found this realised in everyday water governance practices.

The commercial farmers of the area organised in the Marico Bosveld Farmers Association, however, were of a different opinion. Commercial farmer CF C (November 2015, Straatsdrift) described this exemplary for the elite of influential group of commercial farmers:

Since the last 15 years there was a lot of concern about our water. This is all going into the wrong direction of control over our water distribution. We are sceptical about the nationalisation of water and the slogan they [the government] use of ‘water for all for ever’. And they also want to redistribute our water to previously disadvantaged communities; but you can’t just do that, we think our current water supply is not enough.

This statement exemplifies a mind-set prevalent in the white farming community. All commercial farmers expressed the same view in different words, but they all displayed an enormous resistance against the redistributive element of the water policy and against the government in general. A common saying among commercial farmers (in both study areas) was: ‘transformation is the new Apartheid’. Furthermore, all participants perceived the water to be their property and they constantly referred to it as ‘our water’.⁸³

This historically grown understanding of white privileged access to water as the ‘order of things’ was evident amongst all commercial farmers. They all grew up under and later benefitted from an institutionalised system of exploitative farm labour based on race. This perception of supremacy was transported into today’s South Africa and manifested in the perception that a WUA was a mechanism to maintain these privileges of control.

⁸³ However one might ethically and morally think of this statement considering that 5 Km further down the River thousands of people suffer from a lack of water for livelihood purposes, the question of formal property comes into play here. In other words, are the land claims of commercial farmers in their third generation of European settlers valid as well? When are they not valid and why are the land claims of traditional people valid after 200 years, while those of commercial farmers are not? These tricky questions cannot be answered in this thesis, but they prevail looming over the question of access and control of land and water resources in South Africa.

A commercial farmer in Skuinsdrift (CF C, 2015 Straatsdrift) explained: “But we see the WUA as privatisation of water resource, it’s for us the farmers”.

This political culture had also guided the whole processes leading to the final establishment meeting of 2011, as commercial farmer CF C clarified (November 2015, Straatsdrift):

It basically was the irrigators under the scheme that started the process [of meeting, discussing and developing the proposal for the Marico-Bosveld WUA]. Then much later on in the end we put also upcoming farmers there, because we had to do that according to the minister’s Act. They had to be included, so we must do it.

This gives the impression of an active placement of upcoming farmers in decision-making meetings. However, they were not included as they explained: “No, we are not included”, said the two emerging farmers (EF 1 and 2, February 2016, Koffiekraal). None of the participants in the rural villages of Koffiekraal and Skuinsdrift (Brakuil, Uitkyk or Pella) had heard about such meetings, not even the community leaders. This was unknown to thousands of people which were initially thought of to be the beneficiaries of South Africa’s water policy. However, from the 48 commercial farmers however, there was a small group of three, who I have met in the Groot Marico Fresh Produce Project, which helped the emerging farmers with their cultivation of chillies. But apart from this, I have found collaboration to be non-existent in the Groot Marico catchment regarding the WUA establishment.

Commercial farmer C said: “Why our WUA hasn’t been established, I don’t know. But there must have been a policy change somewhere that they don’t want to privatise water through WUAs anymore” (CF C, 2015 Groot Marico). This shows a lack of understanding and a perception about what the idea of WUA as platforms for collaboration of water users who wish to undertake water management for their mutual benefit in the National Water Act 1998 was. However, the National Water Act (section 15) states that “opposite to CMAs the primary purpose of WUAs is not water resource management”, they were anticipated as deliberative forums for overcoming historical inequalities of water access and control. They were thus not at all envisaged as to ‘privatising water’ management, but rather as making it transparent, accountable and participatory while improving water access of the poor - the opposite of what commercial farmers associated a WUA with (see also Kemerink et al. 2011, 2013).

In addition, in the Groot Marico area there was no collaboration between commercial farmers and the national DWS in terms of improving access to water for those historically (and currently) deprived of it. On the contrary, they were engaged in a law suits as opposing parties and the commercial farmers opposed any change that they perceived to undermine their power. However, some of their claims were standing on solid grounds - in a legal sense:

We have an interdict now against the minister of water affairs, because of the pollution happening here. They must stop polluting; we are paying for clean water not polluted water. So they cannot ask us to pay the same amount for poor quality water. You see all those RDP houses now built in Groot Marico. But there is no water works here that can cope with the existing people. So, there is a manhole. When it is raining the sewage goes straight to the river. They suck it out and transport it via truck to Zeerust. But there the plant is also already hard pressed and too small for even Zeerust.

A legal investigation of the National Public Protector (equivalent to the position of a Minister in South Africa) ended with the verdict of mismanagement and neglecting duties to the public by the Groot Marico municipality, and Ramotshere municipality and the DWS itself. This related to a lack of fulfilling planning and practical duties, lack of coordination from national DWS, a lack of information exchange and an abuse of office by municipal officers had led to the situation of raw sewage entering the Marico River. On this basis an interim interdict was issued against the Minister of Water and Sanitation stating that the practices were actually not in line with the law (PMG 2016). Further decisions were pending.

However, this exemplifies that collaboration in issues of water was highly fragmented in the Groot Marico catchment. On the one hand, commercial farmers had an efficient structure of collaboration amongst themselves enabled through multiple platforms for collaboration through their membership in local agricultural working groups thematically organised, and through their membership and leadership in regional farmer's unions and national organisations and committees of AgriSA, the influential national commercial farmers lobby organisation. Historically grown, these organisational structures had a strong connection to the system of formal governance as they resembled the command-and-control governance approach of the Apartheid regime (Schreiner 2009).

On the other hand, the poor rural communities were largely excluded from access to water for productive purposes and in general had limited access to water for any purpose. No collaboration existed in the process of accessing and controlling water between commercial farmers, emerging farmers and poor communities in the study area.⁸⁴ Access to information was essentially limited for the poor and rural people, due to limited access to information and communication technologies, as well as transport. However, remarkably was that their current forms of tribal organisation were based on centuries of traditional history were still an important platform of social organisation. They

⁸⁴ However, in the GMFP food project, two commercial farmers helped the EFs by sharing their agricultural knowledge. This was on a personal basis, but not organised through formal channels, let alone the establishment process of the MBWUA.

provided efficient systems to share knowledge and inform other members living in the study area, and furthermore an important point of connecting to the tribal council to outsiders, such as myself or other actors such as researchers from the University of South Africa. However, the tribal leader explained that their traditional forms of social organisation had started to lose their purpose and the respect of the younger people, because of the existence of a parallel municipal structure (see also Tempelhof et al. 2014). However, they still provided an effective mechanism for collaboration of different actors from the different rural settlements. Using the tribal structures as a platform for collaboration could have proved useful for the DWS, the local or regional offices for disseminating information about the WUA process. However, according to participants, in 12 years this had not happened once.

6.3 RULING THE GAME: THE POWER TO ACCESS AND CONTROL WATER

In the first case study of the Hex River Valley the characteristics of WUA establishment and operation were governed by a WUA Constitution the commercial farmers had developed without the involvement of any other water users. This, besides other factors, gave them considerable structural power over the physical water access of other water user groups by setting up the rules for formal and practical circumstances of such access. The process of establishing the Marico Bosveld WUA in the study area commenced in 2005 on the initiative of commercial farmers CF A, B and C. As it was not established, the following empirical accounts of power were rather agential sources of power.

6.3.1 LIMITED AGENTIAL POWER OF GOVERNMENT ACTORS AND THE ROOM TO MANOEUVRE

The following empirical excerpts from my findings demonstrate why the limited agential power of the DWS and its regional and local offices opened up the room for commercial farmers to act. As a manager from the DWS explained: "No, we don't have the capacity to do what would be required by the Act" (Senior manager at DWS, formerly involved in the MBWUA establishment process, March 2016, Pretoria). Not having the ability to do something, is an expression of a limited agential power defined as the ability to make a difference to a pre-existing state of affairs or a course of events.

6.3.2 KNOWLEDGE, SKILLS AND HISTORICALLY GROWN EXPERTISE

A major aspect of power was related to knowledge about water governance on paper and in practice. This for example refers to knowledge about legal prescriptions for water licenses. This was important to further knowledge about the conditions attached to a water license, or for example, to check which kind of rights and responsibilities a member of WUA has. In a practical sense, it described the utilisation of knowledge to achieve a desired outcome. However, for achieving the outcome of accessing sufficient amounts of water for livelihood purposes, knowledge is surely not enough. For the poor and emerging farmers this often involved the necessity of combining knowledge with physical resources like means of transport in order to physically get to a meeting; or information and communication technology like a computer device with an internet connection to obtain knowledge to put one piece of legislation in relation to another (for example the National Water Act 1998 in relation to the South African Constitution, Art. 25).

Regarding the physical capitals, the lack of transport in the rural communities posed not only a significant challenge for the members of the communities to access meetings, but opened up for commercial farmers the room to manoeuvre. This room was further widened by lack of resources and capabilities of the local authorities to transport people, as a public transportation system is not existent rural South Africa. A senior manager at DWS furthermore described the dependency of the DWS staff on the resources and capabilities of the commercial farmers to fulfil their political mandate (Senior manager at DWS, formerly involved in the MBWUA establishment process, March 2016, Pretoria):

But the emerging farmers now or the communities you will find that they don't understand the language. We are not native English speakers. But to translate the word CMA into their traditional language is even a struggle. So how do I make them understand what I am talking about? Oh yes. They are cut off from media, internet, newspaper, let alone legal acts. How can they know? And I don't wonder why farmers think that they are slow and lazy, but where they just don't have the same resources.

This statement clearly summarizes her experience with establishing WUAs in South Africa under conditions of enormous capacity constraints. However, it also shows another aspect of South African (water) governance: while speaking to government officials they complained about certain issues, but I was never presented with a solution or an indication that the DWS would address this problem in a certain way. For example, the participant from the national DWS asking me in the above quotation: “so how do you make them understand what I am talking about?” She clearly had no idea of how to address this problem and she had not heard about a new strategy from the Department to deal with the issue of language, 18 years of the NWA 1998 was enacted. Similarly, a deputy director for institutional governance at the national DWS for instance asked in relation to WUAs: “One of the other major reasons why there is WUAs just doing things somehow [and not according to the Act], is regulation. How do you regulate them?”

These two statements express the limited understanding of staff at the DWS of how to address a well-known problem. For example, the fact that in a country with 16 different dialects and two official state languages, which are not understood and spoken well by the large majority of the population with a general low literacy, language was a crucial barrier to the implementation of the policy should have not come as a surprise. Especially, as this challenge was also known in the form of research results (see Roux 2011) since the beginning of the water sector reforms after the enactment of the NWA in 1998. It had however not been adequately addressed.

The deputy director for institutional water governance of the DWS explained the plans of the Department to re-structure the institutions in the following way (January 2014, Pretoria):

In terms of the new inst. model, I wouldn't presume to say what it is gonna be. Currently the intention is that water resource management is done by WUAs and IBs. But if it it's gonna be WUAs or IBs or another name [for the new institution] depending on the institutional model, I don't know. But those people currently involved in IBs or WUAs obviously are gonna be the same peoples that will form that particular institution [the new one]. It might be only the peoples that were sitting in the particular WUA or the particular IB. But those users are still gonna be those individuals that will form part of this new institution.

However, the explanation by the deputy director mentions to simply rename the WUAs; he also stated that it would be the same people as before running the institution. Whether this would address the institutional challenges laid out in this thesis, I remain sceptical. However, if the challenges faced with the WUA model have not been researched, understood and potentially addressed in all of their dimensions (not just through formal means), the ‘follow-up’ institutional model will very likely act as a cover for the old problems, instead of unearthing and then solving them. This problem was prevalent in the findings from Case 1.

Additionally, the idea, however, sketched by the DWS manager emphasized just another formal redesign of the existing institutional design. However, this shows a lack of understanding of the problem at hand, one this thesis extrapolates from the empirical evidence: the problem was not (only) the institutional model, nor the name of the institution. It was (besides others) the historically grown socioeconomic inequalities and power asymmetries, which were mirrored in the established institutions in the Hex River Valley. I contend that institutions of water governance in South Africa, that is WUAs and CMAs, cannot be 'designed' to socially engineer patterns of resource use and collective or collaborative behaviour; quite the contrary, it is the social patterns on the ground of how people live their lives, which design how the institutions work in practice.

Nevertheless, regarding the case of the illegal farm evictions of former permanent farm workers on commercial farms along Groot Marico River, commercial farmer B for explained (Commercial farmer CF B, March 2011, Groot Marico): "No, I don't chase them away, I tear down their shack and then they go by themselves". This comment, however utterly cynical it sounded, and however illegal the practice was, described the 'order of things', the reality of power relations in parts of the Groot Marico catchment. The local police force was described by all of the participants as corrupt; the white farmers knew they would not be investigated by them or the Labour Department.

The head of the Madikwe Rural Development Project in Skuinsdrift had lived in the area for 20 years helping the poor rural communities to develop socioeconomically, was given the name 'Mothusi', the helper by local communities. He described the relation to national state Departments and the local police with the following words (June 2015, Skuinsdrift):

In 2008 and 2009 I wrote numerous letters to the police and [the Department of] land affairs about illegal farm evictions. Nothing happened. The local police actually phoned me and said that there is no evidence that this was happening. Other people wrote as well or phoned them, like [the leader from Skuinsdrift community, interviewed here as well], but also others, and told the government about illegal farm evictions. This problem of illegal evictions, like many others, has been brought to their attention long ago. Nothing ever happened. This is how things are running here. Same with the water.

This caused a vacuum of accountability and control (the room to manoeuvre) in which commercial farmers were able to chase away the 'unwanted tenants' without fearing any legal sanctions for this illegal practice and destroying the livelihoods of their former workers. I recorded similar narratives regarding the maltreatment of farm workers by white farmers from the people of Koffiekraal. As in the first case study, the limited agential powers of government actors opened up the room to manoeuvre for commercial farmers. The inability of the South African government to implement and enforce its laws in practice, rendered such laws meaningless in everyday realities and allowed commercial farmers to act without fearing any legal consequences.

Similar to findings from the Hex River Valley, the largely limited knowledge of the DWS and the local and regional office of the DWS about water use and biophysical characteristics in the study area were also prevalent in this second case. The knowledge of staff from the DWS about the geo-hydrological features of the Groot Marico catchment and the water infrastructure in the Marico Bosveld irrigation scheme (MBIS) was essentially limited. The head of the Madikwe Rural

Development Project, who was involved in the initial stages of setting up the Marico Bosveld WUA in the early 2000s explained (June 2015, Skuinsdrift): “In 2006 the DWS had no hard data of the water scheme. They had a roughly hand-drawn map and knew the dam capacity etc., but there was no data about the canals and where they are. In 2006 man! Their knowledge is still very limited and many just don’t care.”

However, this also refers to the limited agential resources and capabilities of the DWS and their regional and local staff. For example, a limited knowledge about hydrological features of the MBIS of DWS staff oftentimes produced a situation in which the commercial farmers in a meeting would possess more detailed knowledge about the NWA 1998 than the representatives of the DWS. The former secretary of the local office, whom I had been introduced to during the final establishment meeting of the MBWUA in 2011, had in 2015 moved on to work for the head offices of DWS in Pretoria. She pointed out (Senior water manager at DWS, March 2016, Pretoria):

One thing I have learned about commercial farmers, they come prepared; they read upfront and are very knowledgeable. They will even tell the representatives of the Department something he doesn’t know and then take out the Act and point to the paragraph and section. Some of them were even part of drafting the NWA and WUA constitution; they know this law even better than we do. And they also know more about the local conditions than our Department officials, because we don’t have enough officials to go to the ground. They know how to play the game.

A commercial farmer (CF C) elaborated on the inability of the DWS to issue formally correct water bills. The amount of water used would sometimes be calculated over a month; the next bill would be over a period of three or even six months with incorrect calculations: “The process of registering water licences and control and measurement of actual water use is so loose. We even get totally faulty water bills which we then dispute. And until a response comes in, a year or more might have passed” (CF C, November 2015, Straatsdrift). This of course meant that the money billed by the DWS for the water used, was put aside in a bank account by the commercial farmers in case of the DWS claiming it in a legally correct manner. This, again, meant for the commercial farmers to earn money out of the interest rate from the bank. The lack of agential power to issue correct invoices to water users opened up the room to manoeuvre for commercial farmers with skilled lawyers at their side (see also Mochotli 2010). This lack of human resources and capabilities to do something (agential power) opened up the room to manoeuvre for those who knew the rules of the game even better than officials of the DWS. As the Department had lost considerable amount of law suits regarding water allocation and billing against the DWS, many officials from the DWS rather decided not to act, instead of being proved wrong in costly law suits (Senior water manager Breede-Gouritz CMA-2, September 2014, Worcester; see also Movik and de Jong 2010; Méndez-Barrientos et al. 2015).

This is clearly a similarity between the two cases investigated, as the Central Breede WUA neighbouring the Hex River Valley had initiated similar lawsuits against the DWS for issuing faulty water bills not complying with the legal standards. In both cases, commercial farmers were able to earn a good interest rate out of it. However, a commercial farmer practising irrigated agriculture under the MBIS, paid approximately R 3 000 per hectare and year to the DWS for his water abstractions, which is around R 0.86 cent per cubic meter (Senior manager Breede-Gouritz CMA-2,

September 2014, Worcester). Considering commercial farmer CF A with a property of 250 hectares, the yearly losses for the DWS amount to 600 000 Rand for just one farmer.

A regional water manager from the DWS explained the situation in terms of human capacities at the regional DWS offices and especially the local DWS office at the Marico Bosveld Dam (DWS regional water manager, November 2015, Hartebeesport Dam):

The most important thing is that the vacant posts need to be filled. Three vacant posts for water control officer regional. And from what I was told, the job of water scheme manager for Marico Bosveld scheme has been taken away. And at the scheme there is currently no qualified water control officer, there is only one guy, he struggles and cannot get to everything needed.

Commercial farmer CF B described a similar challenge concerning broken or not functioning infrastructure: “You are supposed to go to them [the local DWS office], but we do it ourselves mostly. You still need to report to them, but you use your workers for it. Every time he [the local water officer] will tell you ‘sorry, I don’t have the manpower to do it at the moment’.”

The limited agential power prevalent on the national level of DWS I have described in the first case study of the Hex River Valley in detail. The same accounts I have recorded in the Groot Marico case study. Another example was that the Departments internal communication and knowledge sharing amongst staff was described as highly inefficient. The consequences of that the senior manager from DWS formerly involved in the setting up of WUAs for the regional office in Mafikeng (Senior manager DWS, March 2016, Pretoria) described:

Sometimes a director [of DWS] takes care of the Validation and Verification process for example, but he does not communicate with you from another office. The way we disseminate our information in DWS is still lacking behind. So, what happens is that you then go to a WUA meeting and commercial farmers will tell you what happened, but you don’t know about it.

6.3.3 STRUCTURAL POWER

One aspect of structural power as laid out in the theory Chapter 3 and empirically found in the first case study of this thesis was that the institutional rules for the WUA operation in the WUA constitution were created by the same elites whose control over and privileged access to water the new legislation intended to break.

For the commercial farmers in the Groot Marico catchment, control over water resources and their distribution was also the reason to hand in an WUA establishment proposal to the DWS: “Under a GWS [government water scheme] you are not in control, this would change with a WUA; and that is why we did it” (CF C, January 2014, Groot Marico).

Similar to the findings from Case 1, it became clear that for commercial farmers the water policy envisaging water governance through local WUAs, was an opportunity to maintain and further strengthen their privileged access by controlling the WUA structures (the Constitution). Commercial farmer CF B explained:

More influence was the reason for us to establish the WUA. If someone would apply for more water, we would have the last say and that was the goal. Because the WUA would do the water allocations here, in terms of saying there is water available or not. So the control over water here would be with the WUA.

This was the reason for the DWS not to establish the MBWUA. The commercial farmers rallied around farmer CF A and CF B had handed in three proposals for WUA establishment from 2000 until 2012. They all were rejected, because they had neither representation of black farmers, rural communities on the MANCO, nor were any other groups part of it.

However, the aspired structural control that commercial farmers anticipated with the establishment of the WUA never manifested, as the MBWUA was never established. “It was these issues that we have just mentioned, the participation and the representation of HDIs with the WUA that were not there. I don’t want to play the race-card, but some peoples they don’t like the change, because they still live in the past”, said a deputy director for institutional water governance at DWS (January 2014 Pretoria).

However, the judicial interdict of commercial farmers against the Minister of Water and their attempts to use the WUA as mechanisms to take control of the water resources clearly shows that they were able to use the law to act on their behalf. However, in this case, the same was true for the traditional communities around Koffiekraal, which had successfully claimed back the land their ancestors once had lived on along the Marico River.

6.3.3.1 CLAIMING LAND TO ACCESS WATER

The Restitution of Land Rights Act, 1994 (Act 22 of 1994) and the Restitution of Land Rights Amendment Act 2014 provided the legal basis for land claims in South Africa. In order to lodge their land claims, members of the traditional communities in the study area had to form a Community Property Association (CPA). Through oral history of narratives, songs and poems, but also through site specific artefacts like ancestral graves or architectural remnants of buildings, the Hurutse communities around Koffiekraal were able to successfully claim around 400 hectares of land under the MBIS. Overall, in the Northwest Province 47 claims were finalised, seven dismissed, 31 found non-compliant, seven new claims settled and 18 phased projects processed (CRLR 2014).

This means that the rural communities were able to realise water access through this legal mechanism, exemplifying that structural sources of power can be used by anyone with the capacity to do so. The precondition, however, is the endowment with sources of agential power such as knowledge. In founding the CPA Koffiekraal and the other communities were supported by researchers from the University of South Africa with their knowledge about the administrative procedures to launch a land claim. The community leaders were also supported by them to physically hand in the claim at the lodgement office of the Department of Rural Development and Land Claims in the town of Mafikeng located in in 150 Kms distance.

Nevertheless, the successful land claims of the Bahurutse served as a formal mechanism to access water from the MBD. On paper, it entitled them to 5 300 cbm of water per hectare from the dam. But in practice, this never happened, because an elite group of commercial farmers pooled their power in an illegal scheme of water theft. This, I explain in the following sections.

6.3.4 AGENTIAL POWER

Agential sources of power I have defined as the resources and capabilities available to a person or group to do something (power-to). This for example pertained to creating illegal infrastructure, while not fearing any legal sanctions. Illegal water abstractions from the Marico River were common practice among commercial farmers and they also happened 'in plain sight` not fearing any consequences. The regional water manager at DWS regional office at Hartebeesport Dam (150 Kms away from Groot Marico) also pointed out another aspect regarding the water infrastructure of the MBIS: "There are so many water users that abstract directly from the stream now, because the infrastructure of the canals is broken. So they just do it. Some of them [commercial farmers] are stealing water like nothing" (DWS water scheme operator, January 2016, Groot Marico).



Picture 20: Illegal damming and abstractions at the stretch of the Marico River next to the Koffiekraal village

The Head of the information centre in Groot Marico environmental activist (November 2015, Groot Marico), who called the town of Groot Marico her home for the last 30 years, pointed out the same climate of corruption: “The other thing is that you are not allowed to take river water and create on-farm dams with it. But if you look around all the big farmers have on-farms dams, full. But nobody cares here and farmers do whatever they want, money talks quicker than law. They all bribe someone.”

Commercial farmers had developed a habit of opposing water use regulations and paying bribes. A commercial farmer (Commercial farmer CF B, November 2015, Groot Marico) explained:

The DWS as custodian of all the water cannot take the water away from you without a compensation. That is ELU. When I bought the farm in 1981, I had this allocation of 5 300 cbm. It's still valid. If you want more water, you have to drill a borehole and obtain a license for it - some do some don't. But the reason is that it is cheaper to start something wrong, maybe pay the fine and the let it sort out by somebody else. Then you are sure it is already there and you created facts that will likely not be reversed. That's how things work with water here.

Similar to the findings from the Hex Valley, this presents an empirical account of agential power, i.e. having the money and knowledge to drill a borehole illegally, while having the room to manoeuvre caused by a lack of control and law enforcement. However, with regards to water access the community leader of Skuinsdrift explained the corruption between commercial farmers and the regional office (November 2015, Groot Marico): “The commercial farmers get most of the water from the dam, we get only some of it. You have to buy the water from the Department. But also commercial farmers buy water from other farmers, they trade. But currently commercial farmers do

an outside business with the local Gigi⁸⁵ office. I cannot prove it, but someone pays someone under the table, it's corruption."

The difference is the access to resources, said one participant from the first case study, referring to why commercial elites were able to maintain privileged access of water. In Koffiekraal and the surrounding communities visited, this referred even more so to the basic resources and capabilities. Limited food supply and limited access to water of adequate quality were the most visible and voiced by many participants as severely inhibiting their capacities to engage in any activity, let alone in politics or in formal processes of water governance they had no knowledge of. "I can't do much when I am hungry, coz I don't have the energy" (Community leader, November 2015, Koffiekraal), let alone having the financial means or knowledge to drill a borehole.

The relevance to processes of water governance was that people from the rural villages who were constantly worried about the necessities of life lacking sufficient food and water supply, did not have the bodily and mental strength to engage in matters of formal water governance (please see the contextual overview tables in the Appendix for more detailed findings). This was not necessarily because he or she did not wish to do so, on the contrary, but because the realities of her or his everyday livelihood simply left no time and human capacity for such action. The head of the Madikwe Rural Development Program (MRDP) near Koffiekraal, with 30 years of professional experience explained his perception (June 2015, Skuinsdrift): "No, those people fight for survival; they mostly have no interest in politics. They have simply no time to engage in these things, and then they are accused of not wanting to get involved" (Senior manager at DWS, formerly involved in the MBWUA establishment process, March 2016, Pretoria).

6.3.4.1 AGENTIAL POWER, SOCIAL CAPITAL AND 'MANAGING THE POLICE'

Agential power of commercial farmers also came in the form of social connectedness to knowledgeable people and people with official authority and power over others and 'the course of events', such as police investigations. How that pertains to accessing water will become clear throughout this subchapter.

The commercial farmers in Groot Marico had - similar to the commercial farmers in the Hex River Valley - received administrative and legal support from knowledgeable ex-officials from the DWS. One of them was the CEO of the South African Association of Water User Associations (SAAFWUA). Two other ex-officials from the DWS, which cannot be named here, provided their support; it were, however, the same persons who advised the commercial farmers of the Hex River WUA.

However, more important for asserting control over social activities was commercial farmers influence on local people with authority, such as the local police. Participant CF B had been a

⁸⁵ This refers to the local office of the DWS at the dam distributing the water from the MBD. During the Apartheid all cars driven by government officials had a double 'G' on the license plate. This is how 'GG' or 'Gigi' became a synonym for 'the government'.

policeman for 20 years in the local police station, before becoming a farmer. He said that local people would come to him first, if they were looking for someone to “sort things out”. He described how he would be able to deal with a case in which the police would not work according to the wishes of commercial farmers:

So for instance when somebody has a problem with how the police works, they come to me, lodge a complaint and I take it up through the channels. So, first I go to the station commander, if I don't get any joy, I go to the cluster commander, if no joy there, I go to the Province commander and then to national. I still have good contacts. But I am speaking only about my members of the farmers' union, not everybody.

However, his social connectedness to the police was flanked by his contacts to the security sections of AgriNorthwest and AgriSA. As such, commercial farmer CF B was well-connected to people in other authoritative structures concerned with land and water governance in the study area.

Apart from my role at the two farmers' unions of Zeerust and Marico Bosveld as the manager, it is also a third level government. I have quite a lot meetings regarding taxes on farms, labour issues etc. But I am also involved now with the water works here. So I am really quite involved with municipalities here. I am involved in the district municipality in Mafikeng and here, because I am also the safety chairperson for the whole AgriNorthwest and I am also the chairperson for safety information on stock theft in the whole of Northwest Province.

This statement shows his great social connectedness to people in positions of state authority, such as the local police and the municipality, but also to his fellow commercial farmers through his leadership in the farmers' association. This is a source of agential power, as it enabled commercial farmer CF B (and with him CF A and C) to access information, to influence decision-making on municipal level and through ‘managing the police’, which was used as a euphemism for paying financial bribes.

Indeed, he referred to corruption as an integral part of the social context. The saying ‘this is Africa’, I have recorded in interviews with commercial farmers in both study areas. In this context, it served as a justification for bribery, misconduct and corruption to be ‘the order of things’ in large-scale irrigated agriculture in South Africa.

The interview quoted above took place in the local tavern for commercial farmers. After half an hour into the interview, the station commander and chief of the regional police joined us briefly to pay their respect to commercial farmer CF B asking how the family was and how his health, while offering a round of drinks. With him was the head of the intelligence unit of the police that ran a net of informants in the Groot Marico area (Commercial farmer CF B, 2015 Groot Marico). Two commercial farmers with their sons also came to our table from the other end of the tavern to greet CF B. The DWS scheme manager also shook hands with them and then got up to bring CF B a soft drink.

After this local theatre of power, CF B explained: “That [the police] is also the guys we have regular meetings with. Sometimes we meet here in the tavern. Like I said, on the same committees you will always find the same people.” He added: “He [the station commander] was my former boss when I

was still in the police and he could tell me what to do. Now I can tell him what to do.” The participant refused to elaborate on the last part of this statement further and this was our last encounter. However, on an earlier occasion he also had explained with a grin: “And I have to manage the police here, you know, to make them nicely aware what your issues are so that they can act accordingly.” This clearly indicates corruption. The powerful clique of white commercial farmers used their financial power to influence the local police to their benefit.

However, related to water access, it became clear that the financial power of commercial farmers enabled them to bribe water officials as a mechanism to access water illegally, for example, drilling a new borehole without a formal license or damming the Marico River while installing an illegal pump to abstract water from the stream and store it in on-farm dams.

6.3.5 CONTEXTUAL POWER

Within my metaphor of a game, contextual power is the power to determine the attributes of the game arena in which others live their lives and to influence the factors that determine other people’s livelihoods. Through this power, some actors are able to indirectly influence the power base of others, because the resources and capabilities an actor has depend to large degree on how he pursues his livelihood.

Regarding contextual power as influencing the circumstances in which other live their lives and pursue their livelihoods, again, there are similarities between findings from both cases. Similar to the commercial farmers in the Hex Valley, the combined groundwater abstractions of the commercial irrigators in the Groot Marico catchment lowered the groundwater table in the study area below the level of municipal pumps. This jeopardised the water supply of the rural village of Koffiekraal with around 10 000 people and other communities like Skuinsdrift. Water supply here meant multiple water uses for human needs, as well as to watering food gardens and animals with water from the same source.

The rather hidden dimension of contextual power had manifested in the finding that bribery was taken for granted as part of the life as a commercial farmer in South Africa, as it is also the case in many other parts of the world (Ribot 2004; UNESCO 2016). Opposing the government wherever possible and to find informal avenues of decision-making and hide illegal practices was prevalent among commercial farmers throughout both cases. Apart from that, the commercial farmers had the financial power to construct on-farms dams, install illegal pumps into the River or drill a borehole without having a license for it. However, these bribes had become part of the order of things. Similarly, the water scheme operator answered, when asked for the reason of rejecting an interview: “You see; I can't talk about the water here. Things are tricky in this area, you understand?”. On another occasion I met him in the town of Groot Marico by chance and he said that it was “not safe for him” to talk to me. After this short conversation he did not pick up his phone any more when I called. All interviewed commercial farmers under the irrigation scheme knew this scheme operator by name, as they ordered their irrigation water directly through him and only through him.

In order to reveal this rather hidden dimension of power further, the following analytic narrative is employed.

6.3.6 ANALYSIS OF POWER IN PRACTICE

The finding that members of the people Bahurutse successfully claimed their ancestral land, using the formal rules of the game to their benefit, however did not mean physical access to water in practice. The elite group of influential commercial farmers (mainly CF A and B) used their agential power to prevent the emerging farmers from accessing water.

The group of emerging farmers were not able to farm right away, lacking farming equipment. Commercial farmer CF A was aware of that, as he had acted as their financial and administrative advisor handling their legal correspondence, according to the official mentorship model for emerging farmers. He suggested paying their monthly instalments to the Landbank in order to be allowed to use their land for his profit. The emerging farmers agreed. However, as per formal requirements from the grant arrangements, the collective of emerging farmers were only able to act, if all members signed a document. CF A bribed three of the group members to block the group as a whole from taking any decisions, while still using the emerging farmers water entitlements from the local DWS office of 5 300 cbm per season. By this time (2012) the previous scheme manager was still in charge. A year later, he would be charged with fraud, misconduct and abuse of office. He then committed suicide (DWS regional manager, November 2015, Groot Marico).

However, the project leader of the MRDP, was the secretary of the WUA establishment committee in the beginning. He lived on the farm neighbouring (in terms of property boundaries) the farm of commercial farmer CF A. CF A was the initiator of the MRDP in the beginning; he was also the president of the Marico Bosveld Farmers Union; the head of AgriNorthwest; he was also mainly involved in the River Forum the Groot Marico Conservation Association; he was appointed to the Board of the Limpopo CMA and he owned 250 hectares in Skuinsdrift and for a while he was the commercial 'mentor' for the Quiet Living farm of the MRDP. The head of the MRDP project described this the following way:

Another thing is that Quiet living⁸⁶ and MRDP, they have used their government grant to fix the farm, boreholes, pumps, the buildings and then bought cattle. Then my 'good neighbour' [CF A], suggested them 'I will use your land to farm on it, and will therefore pay your Landbank loans'. They took a loan to buy the land, because the government grant was enough not to buy the land, for that they took a loan. Landbank is for farmers. So it worked quite well for 1 year, in which the black owners of the farm worked for [CF A] and he used the farm [including the water] for his profit. In 2011, I found out that he had not paid the Landbank loan. That means he used the land and water of the farm, but never fulfilled his promise to pay their loan to Landbank. Until then I also was still the secretary of the WUA to be established, but from then onwards not any more. After I told him in two public meetings in front of the local government, the Dept. of Land Affairs and others what I as a Christian

⁸⁶ 'Quiet Living' is a development project funded by the South African Department of Agriculture and Rural Development. It is a part of the Madikwe Rural Development project (MRDP) partly funded partly by the German Ministry for Economic Cooperation and Development. This involves inter alia a food garden and a small bicycle assembly workshop.

and Afrikaner think of him. Since then he has rallied all white farmers against me, but [CF B] is his right hand. They also tried to buy the black farmers for kicking me of their land - they said no, he is 'Mothusi' [Setswana dialect for 'the helper'].

You see, but what that means is that the emerging farmers, the owners of that land, now have almost 1 million Rand water debts, which the mentor is responsible for. He stole it from them, the local water affairs office was involved, that's why the guy killed himself [the previous scheme manager]. So the projects are now on a stand-still. That I can say to your question of water access; it's more complex in practice and there is no justice here.

The community leader of the Skuinsdrift development project, who is linked with the Greater Rustenburg Community Foundation and the University of South Africa community engagement program, has also provided me with a narrative on the same topic of how the power to control and access water is a complex web with many sources and how an elite group within the commercial farming community had used their power for allegedly criminal activities. He explained (Community leader of Skuinsdrift, November 2016, Groot Marico):

Currently, we are in a situation in which the emerging farmers owe the DWS 600 000 Rand. A lot of the times a mentor, a white commercial farmer, was involved and he cheated. But that 600 000 was two years ago, I think it must be 800 000 now or a million Rand. We haven't found out how exactly, but what we know is that few commercial farmers went to the previous water scheme manager and stole water together with him. He was corrupt and was bribed by the big guys [CF A and CF B]. When people slowly found out about this, the scheme manager he committed suicide. He was drinking heavily, and was under pressure. It was [CF A]. But I cannot prove it, there is never evidence, its corruption. They steal water and put it on the bill of emerging farmers, because I have never seen any commercial farmer having such a debt, never. So when the government bought the land for you, you have free water for a period of 5 years, they subsidize. So during that subsidizing period, the emerging farmers have somehow magically built up that massive debt that no commercial farmer has ever had since I was born 30 years ago. I know that they [the emerging farmers] haven't even used their full allocation of the 5 300 cbm, but they apparently used even more than that - this is simply not possible. So then, when I investigated that information and started to ask questions, the police threatened to jail me. There was a fight against me when I was investigating this issue. By that time, I was even a member of the ward committee, elected under the councillor of the municipality overseeing the projects in our area, so I had a little protection from them. But now, I am not so sure.

[CF A] was the one and [CF B], they were behind all that, which at the same time were the leading figures in the WUA. They run the show here as ever. [CF A] is an ex-policeman for 20 years before he became a farmer. His wife is still working there. They have that power to influence everything here. And people at the Departments are easily bought. They are greedy. I know from the water officer here, he [the current scheme manager of the local DWS office] told me so. These people have power even to change the Department of Labour. We had so many incidents happening around here with black farm workers being maltreated by the white commercial farmers. We report them and call them [the Department of Labour], but they are bribed. Nothing happens.

These empirical findings represent contextual power of commercial farmers in practice and show how it manifested in the game of accessing water by controlling other powerful actors and authorities. In this case, it was the local police and the local DWS office managing the water from the Marico Bosveld Dam. This previous scheme manager was strongly involved in the development of the MBWUA constitution and the whole establishment proposal. He was also the person whom I describe in the analytic narrative at the beginning of this Chapter, who sent out the invitations for this and other meetings via email. In the final establishment meeting he was assisting commercial farmer A with the documentation. Commercial farmer A also explicitly thanked him for his assistance during that meeting. This fits well with the empirical picture from the study area. The commercial farmers CF A, B and C had known this previous manager for many years (CF C, November 2015, Straatsdrift).

However, one statement of commercial farmer CF B is exemplary for what constitutes a web of power consisting of structural, agential and contextual power that commercial farmers draw upon to oppose the government's and the DWS' actions:

Now that we have stopped paying for water, they will send their staff and sit at a table with us. That is why we are pushing for mediation and did not go to court directly. Luckily we have got the knowledge. If the next meeting is not satisfied with us, we will go to court. But we have to get the minister to appoint a mediator, because then it is at their cost. If we insist on a mediator, we have to pay the mediator. Strategic planning, it's a like a poker game: we know what they know, but they don't know what we know, because we have got the right people there. They underestimate us to our benefit. They forget that what they are trying to do, our people did it long before.

CHAPTER 7: CROSS-CASE SYNTHESIS AND CONCLUDING REMARKS

Based on the empirical findings presented, I argue that power asymmetries between the local actors involved in the WUA in both cases were a root cause for why WUAs were not an appropriate institutional vehicle for changing the inherited racialised characteristics of water access. This, I found especially evident in the first case of the Hex River Valley, but I have also revealed similar accounts of power for the second case study.

I have shown that the functionalist idea of just having to design the right kind of institution and socially beneficial participatory and collaborative action will follow, is often rightly criticized as overly simplistic and avoiding the conceptual complexities of power (Epstein et al. 2014).

Some authors claim that within a designed and formal institutional environment, collaborating actors would keep individual selfishness at bay due to regulations and thus everybody would obtain greater benefits for the group as a whole, as a collective (Dietz et al. 2002). It is also often assumed that - through communication - actors are able to develop trust and cooperation extricating themselves from 'tragedies of the commons' of egoistical overuse of a resource (Hardin 1968) by forming collectively binding rules (Ostrom 1993) that would prescribe certain collaborative behaviour. Such harmony might be achievable. But based on my findings, I caution against omitting that power can 'cut through' these rather romantic notions of designing social collaboration through legislation and formal institutions. This includes not only powerful individuals dominating a course of action to the disadvantage of other players of the game, but also the notion of that a lack of power of to enforce regulations of the referee, opens up a vacuum of power, which is often filled by those already in power.

For example, the government actors in the South African water sector had only limited capacities to transfer the normative vision regarding WUAs of the National Water Act 1998 in to the daily realities of poor local people. The Hex Valley Water User Association was functioning well in terms of managing water for the benefit of existing interests of commercial farmers, but it had not led to an improvement of water access for the poor or the emerging farmers. The commercial farmers in both study areas continued to enjoy their privileged water access backed up by their historical water allocations of Existing Lawful Use. The political idea to convert these entitlements into new licenses after detecting over-allocations has never been implemented in actual practice. A limited knowledge of the DWS about local conditions and practices regarding water also had consequences for processes of the WUA establishment. The commercial farmers interviewed were much better informed about local hydrological characteristics, but also had substantially more knowledge about water legislation and regulations. This gave them a strategic advantage in the game of water access over the other actors which lacked such knowledge.

Limited transparency and accountability opened up room to manoeuvre for commercial farmers to maintain their privileged access. Due to largely limited monitoring and control of the WUA establishment and operation, the commercial farmers in the Hex River Valley for example were able to use the newly established WUA as an administrative platform disguising that, in effect, the old Irrigation Boards from the Apartheid era still existed, to which the CEO of the WUA provided secretarial support. The strategy to control water resources by 'capturing' the WUA was evidently

successful for the commercial farmers in the Hex Valley. My empirical findings showed that the emerging farmers and the poor from the settlements had not been included in the processes of establishing the WUA and were included neither in the day-to-day operation, nor in decision-making regarding water. On the contrary, commercial farmers were able (and given the room by DWS) to formulate the rules for decision-making, membership and the allocation of voting rights to members in the Constitution of the HVWUA themselves. As a result, voting rights were allocated on the basis of land ownership, which largely favoured the landed white agricultural elite owning approximately 90% of the land resources in the Hex Valley. However, even the rules of the WUA Constitution for decision-making were rendered meaningless in practice, because the dominant farmers created a shadow-management committee sidelining the supposedly participatory and representative official management committee.

Instead of influencing decision-making over water access, the emerging farmers in the Hex Valley 'were given' water by the farmers in an informal process. But this water was not sufficient to irrigate their fields and farm sustainably and profitably and presents the opposite of what policy and law had intended.

The DWS did not possess sufficient resources and capabilities to enforce their own rules. Clearly visible for everyone with the intention to see, illegal water abstractions were common practice among all three water user groups. Corruption was prevalent. This vacuum of monitoring, control, and enforcement by the national government was filled by commercial farmer's egoistic actions. For example, in the first case the commercial farmers constructed a large dam with 2.7 million cbm of storage capacity prior to obtaining a license. They created facts, knowing there would be no legal consequences, due to largely limited resources and capabilities at DWS and a lack of political will.

Similarly, in the second case study, commercial farmers illegally constructed on-farms dams on their private property without having a storage license and also pumped water from the Marico River into these dams for irrigation purposes illegally. Paying a fine in the aftermath or bribing water officials was described as common practice by participants of this research. Creating facts which are at least difficult to reverse was a preferred strategy among commercial farmers in both study areas, in the absence of state control.

With regards to the second case study, I have revealed that the commercial farmers had illegally acquired water allocated to emerging farmers. By tricking emerging farmers, who had re

cently obtained access to irrigation water from the Marico Bosveld dam, into an arrangement built on trust within the so-called mentorship model for emerging farmers, one commercial farmer pretended to work with the emerging farmers while taking their water behind the scenes. The involvement of staff of the local DWS in this illegal scheme, was strongly suggested by the findings of this research. The largest and most influential commercial farmer used the water of the emerging farmers, while the money owed to the DWS for this water magically appeared on the water bill of emerging farmers. Investigations never took place and the local police was bribed by the commercial farmers.

The commercial farmers opposed the implementation of the water policy wherever they could (see also Kemerink et al. 2013; Barrientos et al. 2017; Förster et al. 2017 for similar findings). They perceived the policy redressing past inequalities through the re-allocation of what they perceived to be 'their water' as threat to their privileged water access. They perceived this to be the 'order of things' and they were furthermore convinced that the WUA was a private business and not a collaborative process of institutional change. It was rather a continuation of the private socioeconomic and institutional arrangements before 1994 under a new institutional coat.

I have analysed these social realities of the three water user groups in great detail. The power relations inherited from the racial Apartheid system were transported into the supposedly inclusive and collaborative institution of the WUA and resembled its systemic inequality, rather than overcoming it. The factors of power found to be dominant were similar in both study areas allowing the commercial farmers to influence the rules of the game, the ways, in which the rules were implemented (or not implemented) and how the game was played on the ground. Thus, they largely controlled outcomes of the game in terms of water access. As such, this investigation confirms Franks and Cleaver's (2007) findings (and those of the authors mentioned in the previous Chapters criticising formal institutional approaches for steering social behaviour) that local institutions of water governance normatively designed to shape the outcomes of social action, in many instances resemble the social realities on the ground, rather than a normative political and institutional vision. Mosse (1997) asserts that "historically-specific structures of power [...] underlie the norms and conventions of collective resource use, and account for the occurrence and endurance of local institutions of resource use" (p. 470). This argument is strengthened by my findings.

In the Hex Valley, the continued inequality through the WUA was aggravated by the commercial farmer's agential power to control over the physical distribution infrastructure, owned as private property. They furthermore owned the Osplaas dam as private property and the CEO of the HVWUA controlled the amount of water released from the dams to the commercial irrigators. Instead of re-allocating such water to the emerging farmers of the poor small-scale subsistence farmers in the settlements, as the policy promised, the HVWUA made profit from the fact that the VandV had never been completed and no water had been re-allocated. The available water in the Hex was 'locked up' in ELU entitlements. Due to this, the municipality had no control over sufficient amounts of water resources to supply the local people, but was forced to buy water from the HVWUA. As this water came from the Osplaas dam, I have revealed that commercial farmers in effect sold water from their historical over-allocations to the municipality, which sold it to the local residents.

This presents a perversion of the initial goals of the water policy, and with it, a perversion of the normative political ideas of establishing WUAs in the first place. My findings showed that in the absence of the DWS referee to control and monitor the game, commercial farmers turned the WUA into an institution entrenching water rights on paper by controlling the WUA procedures of decision-making and water distribution in practice while excluding the supposedly beneficiaries of the water policy, the poor black population.

Similarly, the lack of capacity at the DWS, the Breede-Gouritz CMA was understaffed and under-resourced and it relied heavily on the existing WUAs to manage water on the local level. Due to personal and professional connections of the main actors of the Hex Valley WUA and the CMA, the

CMA was rather an ally in the game of water governance, supporting the commercial farmers' privileged access to decision-making structures and to physical water resources alike.

This meant for the poor that without owning land, they had no access to millions of cubic metres of irrigation water stored in the large dams, because it was allocated under Schedule 4 of Existing Lawful Use to the agricultural elite. This was evident in both study areas.

Without such access to land, the poor had to rely on water provisions of the local municipalities. The largely limited DWS capacities thus not only negatively influenced the poor's access to and control of irrigation water, but also water supply and sanitation, which, by law, is the task of local municipalities in South Africa. In both study areas, they were largely overburdened, under-staffed and under-financed for the job at hand. In the second case of the Groot Marico catchment, this led to a situation in which the water and sanitation infrastructure was not sufficiently maintained or replaced leading to a direct discharge of wastewater into the River polluting a vital lifeline for all living downstream of the Zeerust and Groot Marico wastewater treatment plant. This affected commercial farmers and poor farmers alike, but the commercial farmers had sufficient economic resources to drill a borehole and abstract groundwater and sue the government for misconduct, while the poor communities had no such option, but relied on the Marico River for watering their cattle and partly their backyard food gardens.

However, during the hot summer months of September to February in the second case study area the municipal pumps did not reach the groundwater table any more, due to commercial farmers increasing groundwater abstractions for irrigation. During this time, only a small stream was left in the River (downstream of the point source pollution with human waste from the municipalities). For the poor people, this meant to be supplied by water tankers, which, however, were described as unreliable and sometimes not coming for two days. During these times, the community drank water from the polluted Marico River. Stomach problems were the least problematic of the described consequences for their health.

Mollinga remarked that "water is a resource deeply embedded in societal processes, actively deployed and regulated, shaping people's lives and livelihoods (...)" (2008, p. 11). I have found this to be empirically true in both study areas. In addition to that, I have shown that it is the very way in which people live their lives and pursue their livelihoods, which shapes the ways in which water is part of broader socioeconomic context, how it is actually distributed and accessed by people, how it is regulated and, ultimately, how it is governed and controlled.

I have revealed that the resources and capabilities of the individual to 'make a difference' to a pre-existing state of affairs or course of events (agential power) are the basis for everyday water governance to be efficient, especially for local level collaboration. People do not just magically collaborate with each other, after centuries of inequality and exploitation, because of the establishment of a formal institution. This needs to be well facilitated and flanked by other programs addressing the underlying socioeconomic problems in South Africa's Provinces, if it seeks to be more effective. As such, the agential side of water governance was largely neglected in South Africa, while overemphasizing the structural dimension.

As power has often been thought as arising from the perceived collision of a certain socio-political order and individual subjects or groups (Saar 2010), it is fair to say that the institution of WUA seen as socio-political order, has provided a fertile ground for the powerful commercial farmers to maintain their privileged access, while colliding with the interests of emerging farmers and the poor at the two study sites. The WUA became a formal vehicle for the already powerful players to further rule the game of accessing and controlling water.

However, apart from the institutional setup, and the limited power of the governmental structures to supply water, the goal of the South African water policy to identify existing over-allocations from the Apartheid era (ELU) and to re-allocate 35 % of existing water resources for economic purposes to poor black communities. This policy has failed in the two study areas 18 years after the enactment of the National Water Act 1998.

In the first case study, I have shown that merely 0.7 % of the available water was allocated to black emerging farmers, while thousands of the poor pursuing their livelihoods under detrimental conditions had no such access. This was not *despite* the new water legislation being enacted and new institutions had been established, but rather *because* they had been established. Opposite to what the new water legislation had promised, the newly established WUAs were rather a formal platform utilised by commercial elites to further entrench their privileged access of South African to water in practice, instead of changing it. As such, it was the historically grown socioeconomic inequalities and power asymmetries which were mirrored in the established institutions in the Hex River Valley. I argue that institutions of water governance in South Africa, such as WUAs and CMAs, cannot be 'designed' to socially engineer patterns of resource use and collaborative behaviour; quite the contrary, it is the social patterns on the ground of how people live their lives, which design how the institutions work in practice. With the words of social theory, this is a result of overemphasizing the structural factors of water governance on paper, while largely neglecting the agential and contextual ones in practice.

This also questions the normative claims of IWRM and its logic of decentralised local level institutions that would produce collaborative processes that would lead to a more sustainable and equitable water access and thus reap benefits for the livelihoods of the poor and marginalised. As if this would magically happen (see also Boelens 2008). Good governance does not necessarily lead to good outcomes; it depends on how it is done and who is doing it. However, this does not make those democratic principles of good governance obsolete, far from it, but the findings presented here clearly show that it is the context of our daily life-realities, such as history and the socioeconomic patterns of people make a living, that shapes institutional practices. Institutions are not just things which exist, they are what the people make of them.

Subsequently, arguing that this institutional approach was ill-suited for transporting the normative political vision into everyday livelihood realities, this thesis revealed that power asymmetries between the involved actors were a core explanatory factor to understand why and how different actors played the game of water governance to their benefit.

My findings from the second case study support this argument drawn from the first case. The establishment of the Marico Bosveld WUA was never finalised, because of the same issues I had

revealed in the first case study: a lack of participation, representation and collaboration of actors in the process of developing the WUA constitution and the WUA proposal. The DWS had realized by 2014 that WUAs were not functioning as anticipated. As such, the daily control over water distribution as well as the infrastructure ownership remained with the DWS in form of their local office at the Marico Bosveld dam. This had, however, not resulted in water allocations to emerging farmers or poor communities, because the commercial farmers were able to steal this water in a corrupt scheme together with the local DWS office.

However, in terms of institutional access, an interesting difference between the cases was that in the second case study the rural communities scattered along the Marico River, were able to obtain water for economic purposes not through any water legislation, but through another formal mechanism. By successfully claiming the land of their ancestors through the Restitution and Land Claims Act, they obtained the water rights attached to this land. This was not directly attached to the title deed, but a Schedule 4 license to the owner of the land. However, through this the rural communities and the emerging farmers were legally entitled to 5 300 cbm per hectare per irrigation season. That this access on paper was not realised in practice is another important finding of the second case, because it strengthens my argument of power asymmetries as a 'field of force' inhibiting improved water access of the poor in the study areas.

The finding that the rural communities in the second case were able to launch a land claim in the first place, also exemplified the importance of agential power of social organisation and connectedness to others pooling knowledge and decision-making. Through their collective organisation in the tribal council of Koffiekraal the people from the communities along the Groot Marico River were able to effectively communicate and collaborate with each other in matters of water access and to devise strategies for action. The council also provided a platform to engage with outsiders, such as the community engagement workers and researchers from the University of South Africa or myself. Their common traditional and ancestral roots of the Hurutse and broader (Se-) Tswana people also provided a strong social fabric of belonging to a collective. Their degree of social connectedness was evidently higher than of the communities in the Hex River Valley. The tribal council proved effective for making decisions in a representative and participatory way and to act within a socially and culturally acknowledged forum. This again furthers this thesis argument that the social context and the actors within are what give institutional rules their meaning in practice. It is people's complex social realities and power asymmetries shaping their relations, which shape water resource governance and its outcomes (see also Cleaver 2012).

From a research perspective I argue that unless formal rules and societal norms are analysed in relation to the group of people and the context they live in, any judgement about their effectiveness is flawed from the beginning. The incorporation of social theory and sociological approaches into analysis of water and natural resource governance that takes into account relations of power is central.

However, legal structures guaranteeing access rights to natural resources will continue to play an important role. But their role in shaping outcomes for local people must not be overemphasized. The

water rights of the existing agricultural elites in South Africa were at the core of the problem of why a reallocation policy was not effective in the study areas; in effect it never took place. The Schedule 4 water abstraction license of Existing Lawful Use (ELU) has made the curtailment of over-allocations at least difficult in practice. To study empirically who formulates the rules, who implements them and with which outcomes for whom exactly, is imperative.

This confirms the findings of Cleaver (2005, 2012) and Ribot and Peluso (2004) that in order to utilise formal structures of laws and regulations to one's benefit, one must possess the agential resources and capabilities to understand, access and utilise such structures in the first place. As the potential beneficiaries of the South African water policy reform - the poor and marginalized black population - had only very limited of such resources and capabilities, the policy implementation was flawed from the beginning. It focused on the structural side of water governance, while neglecting the agential one.

In line with this, the South African government lacked basic resources and capabilities to do, what they set out to do in the normative statements in water policy and legislation. The water re-allocation (WAR) program of the DWS has not reaped major benefits for the poor in the two study areas, as it was never completed by the time of writing this thesis. The program to validate and verify Existing Lawful Use (VandV) had not been finished in any of the South African Provinces and was also explained to be prone to manipulations. Due to this, the DWS' access to essential data about water abstractions of the commercial agricultural sector was limited. However, such data was the indispensable basis for detecting over-allocations of commercial farmers and to re-allocate this water to poor black farmers, whether for emerging farmers or those farming in small-scale backyard food gardens.

The South African WUAs were anticipated as a transparent, accountable, representative, participatory and collaborative mechanism to improve water access of the black population through an institutional platform of democratic decision-making. This idea had not been transported into everyday life of supposedly main beneficiaries of the water policy: the poor black population regardless of whether urban or rural emerging farmers supported by government grants, or whether small-scale subsistence farmers in poor rural communities. On the contrary, the WUA was captured by the old agricultural elites and turned into an institutional mechanism to control the water access of others.

The lack of facilitation by DWS officials during the establishment processes of both WUAs and their lack of control over their practical operation made this capture possible. However, this resulted in one of the most erroneous aspects of the South African WUA approach. The implementers of a public policy initially intended to implement a radical shift in the water policy from racialised privileged white access towards shared control and equal access, was left to the very same actors, who were previously privileged: white commercial irrigation farmers.

The considerable resistance of commercial farmers towards the DWS policies and actions, coupled with their agential power to oppose the government's policy through law suits or by creating illegal

practices that were either not discovered due to lack of control or were ignored after bribes were paid, was surely the driving force behind the perversion of a political idea of change in practice. But it was made possible through the inability of the government to enforce their own rules. This allowed the commercial elites the room to manoeuvre and thus proved the enabling environment to rule the game of access and control of water through formal institutional governance. This also emerged from the findings of this research: if a formal institutional approach is chosen, then accountability understood as answerability and enforceability is crucial. If rules are not followed, enforced, complied with and thus reproduced, they become meaningless in practice.

As such, the outcomes of institutional change are often rather influenced 'from below', rather than 'from above', thereby placing more explanatory importance on the micro-level of social actions and rules-in-practice rather than on a macro-level of the state and how the rules were designed and anticipated to function (see Boelens 2008; Cleaver 2012). For future research, this does not mean that a central state authority and issued policies, regulations and laws have no influence on social action on a societal micro level, on the contrary they surely do have a large influence of steering certain processes. But based on the findings of this investigation, it means that explanatory factors for institutional change are more likely to be found on in the everyday practices on micro-levels of society, than on the macro-levels of government departments and political plans.

The limited agential power of the poor farmers, regardless of whether practising rural backyard farming or trying to enter the commercial sector as so called emerging farmers (although they were not really 'emerging' due to lack of water) is another factor in the game of water access in institutionalised water governance in South Africa.

On the one hand, while almost 100 WUAs had been implemented in the country, almost none of the potential beneficiaries of this institutional approach in the study areas had any knowledge about their existence. This describes a policy failure, especially for a policy that was deemed as participatory. Except a few emerging farmers who had heard about a WUA, because they were employed by commercial farmers, the concept of WUAs was unknown to the large majority of the population. Poverty, a lack of access to sufficient amounts of water and food characterised their livelihoods. Furthermore, a lack of access to information, due to a largely limited access to transport or financial means to pay for local transport, while not having means of internet and communication technology were also prevalent. Hunger and detrimental health conditions shaped the lives of local people in the settlements of the Hex Valley and the rural communities along the Marico River alike. Formal structures and subsequent rules must be met with resources and capabilities of those supposedly governed by them, if they are to have any meaningful positive effect.

On the other hand, the commercial elites were well connected, well-informed and knowledgeable. Their access rights to 94 % of the available water were legally valid; they controlled part of the storage and the entire distribution infrastructure; they controlled the processes of decision-making about water related matters using the HVWUA as an institutional disguise to cover the fact that the old IBs were still existent and the centre of water decision-making and subsequent management actions. In the second case, the same powerful commercial elites tried to do the same for the MBWUA, but this time the DWS was wise enough not to establish the WUA.

The livelihoods of commercial farmers were stable. They enjoyed a high standard of life equal to most developed countries. The farmers were in a powerful position to capture the WUAs and turn them into a formal institutional mechanism to maintain their privileged access to water by controlling the procedures within the WUA that allowed others access decision-making procedures, information and physical access to water. In other words, privileged access led to control and control, in turn, led to better access. The water legislation in South Africa on paper and the Water User Association in practice provided the enabling environment for commercial farmers to use their power to rule the game of accessing and controlling water.

However, the historical context of half a century of white ownership of land and water under the practised principle of riparian rights had an influence on the current water users perception of such ownership. The agricultural elite were able to create a constant narrative of the water resources as 'their water'. The other dominant narrative was that the Hex River Valley was a 'water scarce area', which was employed as the main argument for why black small-scale farmers had not been allocated water according to the motto: we don't have any more water to share. This was the 'order of things' in the Hex River Valley. These two narratives were repeated by all the CMAs senior water managers. Even the emerging farmers referred to the water in the three major dams as 'their water' during the interviews, referring to the commercial farmers, not to themselves.

The black emerging farmers regarded the commercial farmers as the 'natural owners' of the water, and they referred to them during the interviews as 'the boss'. All of the interviewed emerging farmers had been life-long farm workers on the fields of the very same commercial farmers with which they were supposed to sit as equals on the WUA management board. They were also employed by the WUA as part-time workers for maintaining on the irrigation systems, but also to maintain the commercial farmer's agricultural equipment in the WUAs own small mechanical workshop. They were afraid of 'speaking up against their boss' as one of the emerging farmers put it, because their livelihood and that of their families depended on the jobs provided by the commercial farmers. The socioeconomic and racialised hierarchies having their roots in the past continued as dominant factors in today's water governance through local level institutions.

All the above empirical accounts of power combined with (and resting on) the socioeconomic heritage of societal segregation and socioeconomic exploitation of blacks, created a context in both study areas that was perceived as the dominant order of things. This was also a source of power for the commercial farmers as they had dominated the 'order of things' regarding water for centuries.

In conclusion, the resources and capabilities of the poor, their agential power, were not sufficient to engage meaningfully in the formal processes of water governance such as the processes involved in the establishment and operation of WUAs. In the Hex Valley, I found that this was partly a result of how commercial farmers pursued their lives and how they interacted with other people in the course of it (and vice versa). Being the sole provider of labour opportunities in the Valley, they had significant influence on the lives of local people by controlling working hours, salaries and other conditions in the absence of any form of labour contracts or control from the Department of Labour. This was not as prevalent in the second case, but still important. Being well aware of this context, commercial farmers used this source of power.

The powerful agricultural elites even had considerable influence on the formulation of the NWA 1998 and the commercial farmers and their lobby organisations completely dominated the formulation of the WUA model constitution. They had helped to formulate the rules (the NWA), which were the basis of formulating other rules (the WUA constitution), which, in turn, were supposed to regulate the WUA operations.

In addition, the commercial farmers had played this game of formal water access and control for the last 50 years of Apartheid, whereas the black population had been socially and politically oppressed and economically exploited for the last 50 years, at least. The command-and-control approach of formal water governance of the Apartheid era was the governance context the commercial farmer grew up in. As the WUA followed a similar formal structure, this gave commercial farmers a distinct comparative advantage of power over the other actors.

The resources and capabilities of the emerging and subsistence farmers to play the game of water governance were largely limited. They were thrown into a game, the rules of which they had only limited knowledge about and furthermore possessed limited resources and capabilities to play. In the both study areas, due to the absence of an effective and willing 'referee of the game' - the DWS - it was still the old agricultural elites, who ruled the game of accessing and controlling water. This made the WUA an institution, which worked well for the vested interests of commercial farmers, while providing a barrier for accessing and controlling water for those intended to benefit from it: the poor and still marginalized black population.

BIBLIOGRAPHY

- Agrawal, A. 2004. Sustainable governance of common - pool resources: Studying the commons, governing common - pool resources: context, methods, and politics. *Annual Review of Anthropology*, 32: 243-262.
- Agrawal, A. 2013. Studying the commons, governing common - pool resource outcomes: Some concluding thoughts. *Environmental sciences and policy*, 36: 86-91.
- Alasuutari, P. 2010. The rise and relevance of qualitative research. *International Journal of Social Research Methodology*, 13(2): 139-157.
- Alasuutari, P., Bickamn, L. and Brannen, J. 2008. *Social Research Methods*. Sage Publications, California.
- Amenta, E. and Ramsey, K. M. 2010. *Institutional Theory. Chapter 2, Handbook of politics: State and civil society in global perspective*. New York Springer, Available at: www.worldpolity.wordpress.com/institutional-theory-resources/ (accessed: 04.04.2013).
- Anderson, A., Karar, E. and Farolfi, S. 2008. Synthesis: IWRM lessons for implementation. *Water SA*, 34(6): 665-669.
- Ansell, C. and Gash, A. 2007. Collaborative governance in theory and practice. *Journal of Public Administration Research and Theory*, 18(4): 543-571.
- Anukularmphai, A. 2009. Implementing Integrated Water Resources Management (IWRM): based on Thailand's experience, IUCN, Report. Available at: http://cmsdata.iucn.org/downloads/implementing_iwrm__rm_changes_130510__2_.pdf (accessed: April 2013).
- Archer M.S. 1995. *Realist social theory: the morphogenetic approach*. Cambridge University Press, Cambridge.
- Archer, M. 2000. *Being Human: The Problem of Agency*. Cambridge, Cambridge University Press.
- Armitage, D. R., Plummer, R., Berkes, F., Arthur, R. I., Charles, A. T., Davidson-Hunt, I. J., Diduck, A. P., Doubleday, N. C., Johnson, D. S., Marschke, M., McConney, P., Pinkerton, E. W., and Wollenburg, E. K. 2009. Adaptive co-management for social-ecological complexity. *Frontiers in Ecology and the Environment*, 7(2): 95-102.
- Arnstein, S. 1969. A ladder of citizen participation. *Journal of the American Institute of Planners*, 35: 216-224.
- Asmal, K. 1998. Water as a metaphor for governance: Issues in water resources management in South Africa. *Nature and Resources*, 34(1).
- Ayres, L., Kavanugh, K. and Knafl, A. K. 2003. Within-case and across-case approaches. *Qualitative Health Research*, 13(6): 871-883.
- Babbie, E. 2007. *The practice of social research*, 11th edition. Belmont: Thomson Wadsworth.
- Bachman, R. 2007. *The Practice of Research in Criminology and Criminal Justice*. Chapter 5, Causation and Research Designs. 3rd ed. Thousand Oaks, CA: Pine Forge Press.
- Backeberg, G.R. 2006. Reform of user charges, market pricing and management of water: problem or opportunity for irrigated agriculture? *Irrigation and Drainage*, 55(1): 1-12.
- Bailey, K. D. 1994. *Methods of Social Research*, 4th edition. Free Press.
- Barbalet, J.M. 1987. Power, structural resources and agency. *Current perspectives in social theory*, 8(n.d.): 1-24.

- Barlow, M. 2011. Interview in the German newspaper DIE ZEIT. Available at: <http://www.zeit.de/wissen/umwelt/2010-08/menschenrecht-wasser-barlow> (accessed: 25.03.2011).
- Baxter, P. and Jack, S. 2008. Qualitative case study methodology: study design and implementation for novice researchers. *The Qualitative Report*, (13)4: 544-559.
- Bechhofer, F. and Paterson, L. 2000. *Principles of research design in the social sciences*. London: Routledge.
- Benda-Beckmann, F. v., Benda-Beckmann, K. and Spiertz, J. 1998. Equity and legal pluralism: taking customary law into account in natural resource policies. In: *Searching for equity. Conceptions of justice and equity*. Boelens, R. and Davila, G. (Eds.). 1998.
- Benedict, E.C. Bharwani, S. de la Rosa, E. Krittasudthacheewa, C. and Matin, N. 2009. Assessing water-related poverty using the Sustainable Livelihoods Framework. Stockholm Environment Institute, Working paper – 2009.
- Benz, A., Lutz, S., Schimank, U. and G. Simonis (Eds.). 2007. *Handbuch Governance. Theoretische Grundlagen und empirische Anwendungsfelder*. Wiesbaden.
- Berry, S. 1994. Resource access and management as historical processes: conceptual and methodological issues. In Lund C. and Marcussen H. (Eds). *Access, control and the management of natural resources in sub-Saharan Africa: Methodological considerations*, Occasional paper 13, Roskilde University, p. 24-45.
- Berry, A.K. and Mollard, E. 2010. *Social participation in Water Governance and Management: Critical and global perspectives*. London: Routledge
- Biermann, F., Betsill, M. M., Gupta, J., Kanie, N., Lebel, L., Liverman, D., Schroeder, H. and B. Siebenhüner. 2009. *Earth System Governance. People, Places and the Planet. Science and Implementation Plan of the Earth System Governance Project*. Earth System Governance Project Report 1. IHDP Report 20. Bonn.
- Bilib, M., Bardowicks, K. and Arumi, J. L. 2009. Integrated Water Resources Management for sustainable irrigation at the basin scale. *Chilean Journal of Agricultural Research Volume*, 69(1): 69 – 80.
- Biswas, A. K. 2004. Integrated Water Resources Management: A Reassessment, *Water International*, 29(2): 248-256.
- Biswas, A. K. and Tortajada, C. 2010. Future Water Governance: Problems and Perspectives. *International Journal of Water Resources Development*, 26(2): 129 - 139.
- Blomquist, W., & Schlager, E. (2005). Political pitfalls of integrated watershed management. *Society and Natural Resources*, 18(2): 101-117. DOI: 10.1080/08941920590894435.
- Boelens. 2008. *The rules of the game and the game of the rules. Normalisation and resistance in Andean water control*. Netherlands: Wageningen University.
- Boelens, R. and Zwarteveen, M. 2005. Anomalous water rights and the politics of normalization. Paper presented at the ESRC Seminar Politics, Institutions and Participation www.brad.ac.uk/acad/bcid/seminar/water/seminar3/ (accessed: 03.05 2007).
- Bourdieu, P. 1989. Social space and symbolic power. *Sociological Theory*, 7(1): 14-25
- Bourdieu, P. 1977. *Outline of a theory of practice*. Cambridge and New York: Cambridge University Press.

- Brisbois, M.C. 2015. *Natural resource industries and the state in collaborative approaches to water governance: a power-based analysis*. Doctoral Thesis presented to the University of Waterloo, Ontario: Canada.
- Brisbois, M.C. and de Loe, R. 2015. Power in Collaborative Approaches to Governance for Water: A Systematic Review. *Society & Natural Resources*. 00(00): 1-16.
- Brock, K., Cornwall, A. and Gaventa, J. 2001. Power, knowledge and critical spaces in the framing of poverty policy. Working paper 143, Institute of Development Studies. Brighton.
- Brown, J. 2013. Can Participation Change the Geography of Water? Lessons from South Africa. *Annals of the Association of American Geographers*, 103(2): 271-279, DOI: 10.1080/00045608.2013.754685.
- Bruns, B. 2009. Metaphors and methods for institutional synthesis. Paper presented at the water resource governance and design principles, workshop in political theory and policy analysis. In Cleaver, F. 2012. (see below).
- Bryman, A. 2008. The end of paradigm wars? In Alasuutari, P., Bickman, L. and Brannen, J. (Eds.) 2008. *Social research methods. The Sage Handbook*, pp. 13-26.
- Burnham, P., Lutz, K. G., Grant, W. and Layton-Henry, Z. 2008. *Research methods in politics. 2nd edition*. Basingstoke: Palgrave Macmillan.
- Butterworth, J., Warner, J., Moriarty, P., Smits, S. and Batchelor, C. 2010. Finding practical approaches to Integrated Water Resources Management. *Water Alternatives*, 3(1): 68-81.
- Byrne, D. and Ragin, C. C. (Eds.). 2009. *Case Based methods. The SAGE Handbook*. Thousand Oaks: SAGE Publications.
- Carloni, A. S. and Crowley, E. 2005. Rapid guide for missions. Analysing local institutions and livelihoods. FAO publications.
- Carney, D. 1998. *Sustainable rural Livelihoods – What Contribution can we make?* London, DFID, p. 7ff.
- Chambers, R. 2008. *Revolutions in Development Inquiry*. Earthscan. London.
- Chambers, R. 1997. *Whose Reality counts? Putting the Last First*, Harlow: Longman, p. 102-161.
- Cherlet, J. and Venot, J.P. 2013. Structure and agency: understanding water policy changes in West Africa. *Water Policy*, 15: 479-495.
- Clandinin, D. J. and Connelly F. M. 2000. *Narrative inquiry: Experience and story in qualitative research*. San Francisco: Jossey-Bass publishers.
- Clarke, A. and Star, S. L. 2008. The social worlds framework: A theory/methods package. In Edward Hackett, E., Amsterdamska, O., Lynch, M. and Wajcman, J. (Eds.). *The handbook of science and technology studies* (pp. 113-139). Cambridge, Massachusetts: The MIT Press.
- Clay, E. and Schaffer, B. 1984. Room for manoeuvre: the premise of public policy, In: Clay, E. and Schaffer, B. (eds). *Room for manoeuvre: an exploration of public policy planning in agricultural and rural development*. London: Heinemann.
- Cleaver, F. 2002. Reinventing institutions: Bricolage and the social embeddedness of natural resource management. *The European Journal of Development Research*, 14(2): 11-30.
- Cleaver, F. and Franks, T. 2005. How institutions elude design: River basin management and sustainable livelihoods. BCID Research Paper No. 12. Bradford, UK: University of Bradford.
- Cleaver, F. and Franks, T. 2007. Water Governance and poverty: a framework for analysis. *Progress in Development Studies*, 7(4): 291 – 306.

- Cleaver, F. 2012. *Development through bricolage, rethinking institutions for natural resources management*. 1st ed., Routledge London.
- Clegg, S.R. 1989. *Framework of power*. Thousand Oaks: SAGE publications.
- Clemens, E. S. and Cook J. M. 1999. Politics and Institutionalism: Explaining durability and change. *Annual Review of Sociology*, 25(n.d.): 441 – 466.
- Clement, F. 2010. Analysing decentralised natural resource governance: Proposition for a 'politicised' institutional analysis and development framework. *Policy Sciences*, 42(2) : 129-156.
- Coleman, J. 1990. *The Foundations of Social Theory*. Cambridge, MA: Belknap of Harvard University Press.
- Collins, K. B., Colvin, J. and Ison, R. L. 2009. Building 'Learning catchments' for integrated catchment management: designing learning systems and networks based on experiences in the UK, South Africa and Australia. *Water Science and Technology* 59, (n.d.): 687 – 693.
- Cooke, B. and Kothari, U. (Eds). 2001. *Participation: the new tyranny?* London, UK and New York, USA: Zed Books.
- Cox, D. 2008. Harnessing the potential for local government to fulfil IWRM policy. What needs to be done? Power Point Presentation at the Institute of Natural Resources, Department of Water Affairs, South Africa. Available at: <http://www.iwrm.co.za>. (accessed: 20.11.2010).
- Crabtree, B. and Miller, W. (Eds.). 1999. *Doing Qualitative Research (2nd edition)*. London: Sage Publications.
- Crais, C. 1992. *White supremacy and black resistance in pre-industrial South Africa: The making of the colonial order in the Eastern Cape*. Cambridge: Cambridge University Press.
- Cranston, M. 1968. *Jean-Jacques Rousseau. The Social Contract*. Penguin Classics, London, pp. 9-42.
- Creswell, J. W. 2007. *Qualitative inquiry and research design: choosing among five approaches*. London: Sage Publications.
- Creswell, J. W. 2009. *Research design: qualitative, quantitative and mixed methods approaches*. London: Sage Publications.
- Dane, F.C. 1990. *Research Methods*. Pacific Grove: Brooks and Cole.
- DEAT. 2005. River Health Programme (2005), State-of-Rivers Report: Monitoring and Managing the Ecological State of Rivers in the Crocodile (West) Marico Water Management Area. Department of Environmental Affairs and Tourism (DEAT), Pretoria.
- De Haan, L. and Zoomers, A. 2005. Exploring the frontiers of livelihoods research. *Development and Change*, 36(1): 27 – 47.
- Della Porta, D. and Keating, M. 2008. *Approaches and methodologies in the social sciences. A pluralist perspective*. Cambridge: Cambridge University Press.
- Delpont, C. S. L. 2011. Quantitative data collection methods. In De Vos, A. S., Strydom, H., Fouché, C. B. and Delpont, C. S. L. 2011. *Research at the grass roots for the social sciences and human service professions*. 4th ed. Pretoria: JL Van Schaik Publishers.
- Denscombe, M. 2008. Communities of practice: a research paradigm for the mixed methods approach. *Journal of Mixed Methods*, 2: 270-284.
- Denzin, N.K. 1989. Interpretive interactionism. In: Gareth Morgan (Ed.), *Beyond methods: Strategies for social research*. Beverly Hills, CA: Sage Publications.

- Department of Agriculture, Forestry and Fisheries. 2012. Production guideline, grapes. Available at: https://images.agri-profocus.nl/upload/post/Grape_Production1500620234.pdf (accessed: 13.09.2015).
- Department of Environmental Affairs and Tourism (Pretoria), River Health Programme, 2005, State of Rivers Report: Monitoring and Managing the Ecological State of Rivers in the Crocodile (West) – Marico Water Management Area, p. 2-53.
- De Vos, A., Strydom, H., Fouché, C.B. and Delport, C. S. L. (Eds.), 2012. *Research at Grass Roots for the social sciences and human service professions*, 4th ed. Pretoria: Van Schaik.
- Denzin, N.K. and Lincoln, Y.S. 2000. Handbook of qualitative research. SAGE publications, Thousand Oaks, California.
- DFiD (Department of international Development, UK), 2005. Meeting the water and sanitation millennium development goals. Department for International Development of the UK.
- Dietz, T., Dolsak, N., Ostrom, E. and Stern, P. C. 2002. *The drama of the commons*. In Dietz, T., Dosak, N., Ostrom, E. and Stern, P. C., Stovich, S. and Weber E. U. 2002. *The drama of the commons* (p. 3-35). National Academic Press, Washington DC.
- Donmoyer, R. 1990. Generalizability and the single case study. In Elliot W. Eisner, and Alan Peshkin (Eds.). *Qualitative inquiry in education: The continuing debate*. New York, NY: Teachers College Press.
- Dowding, K. 1994. The compatibility of behaviouralism, rational choice and new institutionalism. *Journal of Theoretical Politics*, 6(1): 105-117.
- DPSA. 2014. Department of Public Service and Administration, website 2014 (accessed: 28.03.2015).
- Dreyfus, Hubert L. and Dreyfus, Stuart E. 1988. *Mind over machine: The power of human intuition and expertise in the era of the computer*. New York, NY: Free Press.
- Dube, D. and Swatuk, L. A. 2002. Stakeholder participation in the new water management approach: a case study of the Save catchment, Zimbabwe. *Physics and Chemistry of the Earth* 27(n.d.): 867-874.
- Duflo, E. and Banerjee, A. 2009. *Poor Economics: A Radical Rethinking of the Way to Fight Global Poverty*. Philadelphia, USA: Public Affairs.
- Du Plooy-Cilliers, F., Davis, C. and Bezuidenhout, R.-M. 2014. *Research matters*. Cape Town: Juta.
- Du Toit, A. 2004. *Forgotten by the highway: globalisation, adverse incorporation and chronic poverty in a commercial farming district in South Africa*. CPRC Working Paper 49, PLAAS chronic poverty and development series, No. 4, p. 1-39.
- DWA. 1997. Water Service Act 1997. Available at: www.dwa.gov.za/IO/Docs/a108-97.pdf <http://www.info.gov.za/view/DownloadFileAction?id=70766> (accessed: 04.02.2011).
- DWA. 1998. National Water Act 1998. Available at: www.dwa.gov.za/Documents/Legislature/nw_act/NWA.pdf (accessed: February 2013).
- DWA. 2000. Hydrological map of the Western Cape. Obtained from the DWS head office in Pretoria in 2015.
- DWA. 2003. Department of Water Affairs (former Department of Water Affairs and Forestry), Ecoregions of South Africa - Level 1, p. 12ff.
- DWAF. 2004. Department of Water Affairs and Forestry, South Africa. B. Crocodile (West) and Marico Water Management Area: Internal Strategic Perspective of the Marico-Upper Molopo and Upper Ngotwane catchments. Prepared by Goba Moahloli Keeve Steyn in association with

- Golder and Associates and Tlou and Matji (Pty) Ltd. DWAF Report No. P WMA 03/000/00/04043333999.
- DWA. 2004a. Department of Water Affairs (former Department of Water Affairs and Forestry), National Water Resource Strategy - First Edition, Pretoria.
- DWA. 2004b. Department of Water Affairs and Forestry, South Africa. Crocodile River (West) and Marico Water Management Area: Internal Strategic Perspective of the Crocodile River (West) catchment: Prepared by Goba Moahloli Keeve Steyn (Pty) Ltd, Tlou and Matji (Pty) Ltd and Golder Associates (Pty) Ltd, on behalf of the Directorate: National Water Resource Planning. DWAF Report No. 03/000/00/0303.
- DWAF. 2007. Department of Water Affairs and Forestry. Guidelines for the establishment and operation of a developmental Water User Association, Guide 3 in the CMA/WUA Guide Series, Available at: <https://www.dwaf.gov.za/IO/Docs/WUA/WUA%20Establishment%20Guide/ApprovedGuideonestablishmentoperationofAgriculturalWUAs.pdf> (accessed: 04.01.2013).
- DWA. 2011. Department of Water Affairs, South African Local Government Association, 2011. Available at: <http://www.iwrm.co.za/index.html> (accessed: 26.03.2011).
- DWA. 2013. National Water Policy Review 2013. Printed copy. Available at: www.dwa.gov.za/Documents/NWPR.pdf (accessed: 10.01.2014).
- DWS. n.d. Status Report on Water User Associations in South Africa. Power point presentation to the Portfolio Committee on Water and Environmental Affairs, minutes of the meeting of the 24th of April 2013. Made available by the Parliamentary Monitoring Group at: www.pmg-assets.s3-website-eu-west-1.amazonaws.com/130424status.ppt (accessed: 12.08.2014).
- DWS. 2017. Briefing of the portfolio committee on water and sanitation on the transformation of irrigation boards. Presented by Mr. Mashitsho, Director-General on 20 June 2017. Available at: https://pmg.org.za/files/170620Irrigation_Boards.pptx (accessed: 11.11.2017).
- DWS. 2017a. Water is life, sanitation is dignity. Website of DWS regarding hydrological facts. Available at: <http://www.dwa.gov.za/Hydrology/Weekly/Province.aspx> (accessed: 09.08.2017).
- Eckstein, H. 2002. Case study and theory in political science. In Gomm, R., Hammersley, M. and Foster, P. (Eds.), *Case study method: Key issues, key texts*. London: Sage Publications.
- Ellis, F. 2000. *Rural livelihoods and diversity in developing countries*. Oxford University Press. In: Franks and Cleaver 2007, p. 294.
- Elisheva, S. 1997. Empowerment and community planning: *Theory and Practice of People-Focused Social Solutions*. Tel Aviv: Hakibbutz Hameuchad Publishers. Available at: www.mpow.org (accessed: 08.09.2015).
- Epstein, G. 2014. Studying power within the social-ecological-systems framework. In Manfredo, M., Vaske, J.J., Rechkemmer, A. and Duke, E. A (Eds.). 2014. *Understanding society and natural resources*. Springer Open, open access at SpringerLink.com, p. 111 - 135.
- Esterberg, K. G. 2002. *Qualitative methods in social research*. Boston, MA: McGraw-Hill.
- Farmers Weekly. 2012. Empowerment: the secret to its success. Newspaper article, available at: <https://www.farmersweekly.co.za/agri-business/empowerment/empowerment-the-secret-to-its-success/> (accessed: 05.07.2014).

- Fayssse, N. 2004. An assessment of small-scale user's Inclusion in large-scale water user associations of South Africa, International Water Management Institute, Colombo, Research Report 84, Sri Lanka.
- Fayssse, N. and Gumbo, J. 2004. The transformation of irrigation boards into water user associations in South Africa: Case studies of the Umlaas, Komati, Lomati and Hereford irrigation boards. Volume 2. Working Paper 73. Colombo, Sri Lanka: International Water Management Institute.
- Fernandez-Stark, K., Bamber, P. and Gereffi, G. 2016. Peru in the Table Grape Global Value Chain: Opportunities for Upgrading, Technical Report · January. DOI: 10.13140/RG.2.1.2378.4724. Available at: www.cggc.duke.edu/.../2016%20Duke%20CGGC%20Grape%20GVC%20Report%20 (accessed 11.11.2016).
- Flick, U. 2006. *An introduction to qualitative research, 3rd Ed.* London: SAGE Publications.
- Flyvbjerg, B. 2001. *Making social science matter: Why social inquiry fails and how it can succeed again.* Cambridge: Cambridge University Press.
- Flyvbjerg, B. 2006. Five Misunderstandings about Case-Study Research. *Qualitative Inquiry* 12 (April): 219-245.
- Fossey, E. C., McDermott, H. F. and Davidson, L. 2002. Understanding and evaluating qualitative research. *Australian and New Zealand Journal of Psychiatry*, 36: 717 - 731.
- Fouché, C. B. and Delport C. S. L. 2011. *Research at the grass roots for the social sciences and human service professions.* 4th ed. Pretoria: JL Van Schaik Publishers.
- Fouche, C. B. and Schurink, W. 2011. *Qualitative Research Designs.* In: De Vos, A.S. et al. 2012 (see below).
- Förster, J.J., Downsborough, L. and Chomba, M.J. 2017. When policy hits reality: structure, agency and power in South African water governance. *Society & Natural Resources*, 30(4): 521-536 <http://dx.doi.org/10.1080/08941920.2016.1268658>.
- Förster, J.J. 2011. Integrated Policy - Disintegrated Practice: A Livelihoods-Policy-Interplay Analysis (LPIA) of IWRM implementation in the Crocodile (West) - Marico Water Management Area in South Africa. Masters thesis at the University of Queensland.
- Funke, N., Nortje, K., Findlater, K., Burns, M., Turton, A., Weaver, A., Hattingh, H. 2007. Redressing Inequality: South Africa's New Water Policy. Available at: <http://www.environmentmagazine.org/archives/back%20issues/april%202007/funke-full.html> (accessed: 05.06.2014).
- Franks, T. and Cleaver, F. 2007. Water Governance and poverty: a framework for analysis. *Progress in Development Studies*, 7(4): 291-306.
- Frey, L., Botan, C. and Kreps, G. 1999. *Investigating communication: An introduction to research methods.* (2nd ed.) Boston: Allyn & Bacon.
- Gage, N. 1989. The paradigm wars and their aftermath: a historical sketch of research on teaching since 1989. *Educational researcher*, (18): 4-10.
- Galtung, J. 1969. Violence, Peace, and Peace Research. *Journal of Peace Research*, 6(3): 167-191.
- Geary, M. 2005. The role of legitimacy in the relationships between water users and governance bodies under conditions of increasing water stress. PhD thesis, School of Industrial and Manufacturing Sciences, Cranfield University, Cranfield.
- Giddens, A. 1984. *The constitution of society: outline of the theory of structuration.* Polity Press.

- Given, L. M. 2008. *The Sage Encyclopedia of Qualitative Research Methods*. Sage: Thousand Oaks California.
- Glense, C. 2006. *Becoming qualitative researchers: an introduction*. Boston: Pearson Education.
- Global Water Partnership. 2011. Floods and droughts. Affects the already vulnerable. Available at: <http://www.gwp.org/The-Challenge/The-Urgency-of-Water-Security/Floods-and-Droughts/> (accessed: 04.02.2011).
- Goetz, J. P. and LeCompte, M. D. 1984. *Ethnography and qualitative design in education research*. Orlando, FL: Academic Press.
- Goggin, M.L., Bowman, A.O.M., Lester, J.P. and O'Toole, L.J. 1990. *Implementation Theory and Practice: Toward a Third Generation*. Glenview, Illinois, Scott Foresman/Little, Brown Higher Education.
- Goldin, J., Rutherford, J. and Schoch, D. 2008. The place where the Sun Rises: An Application of IWRM at the Village Level. *Water Resources Development*, 24(3): 345-356.
- Goldin, J. 2013. From vagueness to precision: raising the volume in social issues for the water sector. *Water Policy*, March 2013. DOI:10.2166/wp.2012.211.
- Greene, J. C. 2008. Is mixed methods social inquiry a distinctive methodology? *Journal of Mixed Methods Research*, 2: 7-22.
- Guelke, L. and Shell, R. 1992. Landscape of Conquest: Frontier Water Alienation and Khoikhoi Strategies of Survival, 1652–1780. *Journal of Southern African Studies*, 18(4): 803-24.
- Guest, G., Bunce, A. and Johnson, L. 2006. How Many Interviews Are Enough? An Experiment with Data Saturation and Variability. *Field Methods*, 18(1): 59-82.
- Habermas, J. 1986. *Theory of communicative action. Reason and the rationalisation of society*. Cambridge: Polity Press and Blackwell Publishers.
- Haider, H. and S. Rao. 2010. *Political and Social Analysis for Development Policy and Practice: An Overview of Five Approaches*. Birmingham, Governance and Social Development Resource Centre, commissioned by AusAID.
- Halbe, J. et al. 2013. Towards adaptive and integrated management paradigms to meet the challenges of water governance. *Water Science & Technology*, 67(11): 2651-2660.
- Hardin, G. 1968. The tragedy of the commons. *Science*, (new series) 162(3859): 1243-1248.
- Harper, D. 2016. Etymology Dictionary. Available at: http://www.etymonline.com/index.php?allowed_in_frame=0&search=collaborare (accessed: 19.09.2016).
- Harvey, D. 2009. Complexity and case. In Byrne, D. and Ragin, C. (Eds.) 2009. *The Sage handbook of case-based methods*. California: Thousand Oaks.
- Haugaard, M. and Clegg, S. R. 2012. Introduction: Power and politics. In Haugaard, M. and Clegg, S. R. (Eds.) 2012. *Power and Politics. Sage handbook of power*, Thousand Oaks, California.
- Hay, C. and Wincott, D. 1998. Structure, agency and historical institutionalism. *Political Studies*, XLVI (1998): 951-957.
- Heikkila, T., Schlager, E. and Davis, M. W. 2011. The role of cross-scale institutional linkages in common pool resource management: Assessing Interstate River Compact. *Policy Studies Journal*, 39(1): 121-145.
- HelenIDS. 2008. Ian Scoones on Sustainable Livelihoods Approaches - Intro Part 1, [you tube video file]. Available at: <https://www.youtube.com/watch?v=ELlxFWEQdB8> (accessed 09.09.2015).

- Herrfahrdt-Pähle, E. 2010. Introducing Catchment Management: the case of South Africa. *DIE* 2010 (3): 1 -19. (German Development Institute - Deutsches Institut für Entwicklungshilfe), Bonn.
- Homans, G. 1974. *Social behaviour: its elementary forms*. Harcourt Brace; revised edition published May 1974.
- Horlemann, L. and Dombrowsky, I. 2010. Institutionalising IWRM in developing and transition countries: the case of Mongolia. *Environ Earth Sci*, (2012) 65: 1547 - 1559.
- Houtzager, P. 1999. Collective action and patterns of political authority: rural workers, church and state in Brazil, draft paper, Brighton: Institute of Development Studies. In Brock et al. 2001 (see above).
- Hume, D. 1738. *Ein Traktat über die menschliche Natur (A Treatise of Human Nature)*. Buch I-III. Übersetzung Theodor Lipps: Hamburg, p.153.
- Hyden, G. 2005. Why Do Things Happen the Way They Do? A Power Analysis of Tanzania, Sida. Available at: http://hei.unige.ch/news/files/Goran_Hyden_Power_analysis.pdf (accessed: 25.06.2016).
- Hyden, G. 2006. Beyond Governance: Bringing Power into Development Policy Analysis. Paper presented to the Danida/GEPPA Conference on Power, Politics and Change in Weak States, Copenhagen, 1-2 March. Available at: <http://www.geppa.dk/files/activities/Conference%202006/Goran%20Hyden.pdf> (accessed: 01.01.2016).
- IDP. 2013. Internal Development Plan Brede-Valley Municipality. Obtained from the municipal manager during field visits in September 2014.
- Ingram, H. and Clay, K. 2000. The choice-within-constraints new institutionalism and the implications for sociology. *Annual Review of Sociology* 26: 525-546. Available at: <http://www.columbia.edu/~pi17/525.pdf> (accessed: 18.06.2016).
- Ingram, H. 2013. Doing better and delivering worse: pathology of water experts. Foreword, In: de Boer C., Vinke-de Kruif, J., Özerol, G. And Bressers, H. 2013. *Water governance, policy and knowledge transfer*. New York: Routledge.
- Ioris, A. 2012. The limits of integrated water resources management: a case study of Brazil's Paraíba do Sul River Basin. *Science, Practice, and Policy*, 4(2): 4 - 11.
- IRIN. 2014. Land of dust. Published on May 15, 2014. Available at: <http://www.irinnews.org/report/100089/new-irin-film-land-dust> (accessed 04.11.2015).
- Jaspers, F. G. W. 2003. Institutional arrangements for integrated river basin management, *Water Policy* 5, p. 77-90.
- Jia, H. 2007. *Groundwater Resource Evaluation in Table Mountain Group Aquifer Systems*. PhD thesis submitted to the Department of Earth Sciences, University of the Western Cape, South Africa.
- Jick, T. D. 2006. Mixing Qualitative and Quantitative Methods: Triangulation in Action. *Administrative Science Quarterly*, 25(4): 602 – 611.
- Jonker, L. 2007. Integrated Water Resources Management: The theory-practice nexus, a South African perspective. *Physics and Chemistry of the Earth*, 32: 1257–1263.
- Jonker, L. E. 2014. Personal communication at the University of Cape Town, April 2014.

- Jonker, L., Swatuk, L. E., Matiwane, M., Mila, U., Ntloko, M. and Simataa, F. 2010. Exploring the lowest appropriate level of water governance in South Africa, Report to the Water Research Commission, WRC Report No. 1837/1/10.
- Karar, E. 2008. Integrated Water Resources Management (IWRM): Lessons from implementation in Developing Countries. Foreword to the IWRM Conference special edition. *Water SA*, 34(6): 661-664 Revised version. Originally presented at the International Conference on Integrated Water Resource Management (IWRM) entitled: *Lessons from Implementation in Developing Countries* which took place from 10 to 12 March 2008 in Cape Town, South Africa, at the Cape Town International Convention Centre.
- Karar, E., Mazibuko, G., Gyedu-Ababio, T. and Weston, D. 2011. Catchment Management Agencies: a case study of institutional reform in South Africa. In: Schreiner et al. 2011.
- Kemerink, J.S., Ahlers, R. and van der Zaag, P. 2011. Contested water rights in post-apartheid South Africa: the struggle for water at catchment level. *Water SA*, 37(4): 585-594.
- Kemerink, J.S., Méndez, L. E., Ahlers, R., Wester, P. and van der Zaag, P. 2013. The question of inclusion and representation in rural South Africa: challenging the concept of water user associations as a vehicle for transformation. *Water Policy* 15, (2013) 243–257.
- Keohane, R. and Nye, J. 1993. 'The United States and International Institutions in Europe after the Cold War'. In R. Keohane, R. Nye and J. S. Hoffman (Eds.), *After the Cold War: International Institutions and State Strategies in Europe 1989*. Harvard University Press, Cambridge.
- Khan, S. and VanWynsberghe, R. 2008. Cultivating the Under-Mined: Cross-Case Analysis as Knowledge Mobilization. *Forum Qualitative Sozialforschung* 9(1), Art. 34. Available at: <http://nbn-resolving.de/urn:nbn:de:0114-fqs0801348> (accessed: December 2014).
- King, A. 2004. *The Structure of Social Theory*. Routledge, New York.
- King, G., Keohane, R.O. and Verba, S. 1994. *Designing social inquiry: scientific inference in qualitative research*. Princeton: Princeton University Press.
- Klooster, D. 2000. Institutional Choice, Community, and Struggle: A Case Study of Forest Co-Management in Mexico. *World Development*, 28(1): 1-20.
- Kooiman, J. 2003. *Governing as Governance*. Sage Publications, California.
- Koontz, T. M. 2005. We finished the plan, so now what? Impacts of collaborative stakeholder participation on land use policy. *Policy Studies Journal*, 3(3): 459-481.
- Kramm, J. and Wirkus, L. 2010. Local Water Governance: Negotiating Water Access and Resolving Resource Conflicts in Tanzanian Irrigation Schemes. MICROCON Research Working Paper 33, Brighton: MICROCON.
- Kruger, L. W. and Neumann, W. L. 2006. *Social work research methods: qualitative and quantitative applications*. Boston: Pearson Education.
- Kulindwa, K. and Lein, H. 2008. Water and Poverty: the inextricable link, in: Hemson, D, Kulindwa, K., Lein, H. and Mascarenhas, A. 2008. Poverty and water. Explorations of a reciprocal relationship, p. 1 -13.
- Lakika, M.C.S., Meire, P. and Ngaga, Y.M. 2015. Exploring watershed conservation and water governance along Pangani River Basin, Tanzania. *Land Use Policy*, 48: 351–361.
- Langridge, R., Christian-Smith, J. and Lohse, K.A. 2006. Access and Resilience: Analyzing the Construction of Social Resilience to the Threat of Water Scarcity, *Ecology and Society*, 11(2), p. 18f.

- Lankford, B. A. and Cour, J. 2005. From integrated to adaptive: a new framework for water resources management of river basins in the Proceedings of the East Africa River Basin Management Conference, Morogoro, Tanzania, in: Franks, T. and Cleaver, F. 2007, *Water Governance and poverty: a framework for analysis*, *Progress in Development Studies*, 7(4): 291 – 306.
- Lankford, B. and Hepworth, N. 2010. The cathedral and the bazaar: Monocentric and polycentric river basin management, *Water Alternatives*, 3(1): 82-101.
- Lasswell, H. 1936. *Politics: Who Gets What, When, How*. Meridian Books: Cleveland.
- Laube, W. 2009. Changing the course of history? Contextualizing the adoption and implementation of water policies in Gahna and South Africa, ZEF Development Studies, n.d. Bonn: LIT (Center for Development Studies - ZEF).
- Lautze, J., de Silva, S., Giordano, M. and Sanford, L. 2011. Putting the cart before the horse: water governance and IWRM. *Natural Resources Forum*, 35(2011): 1-8.
- Lemos, M. C. and Agrawal, A. 2006. Environmental governance. *Annual Review of Environment and Resources*, 31: 297-325.
- Levi-Faur, D. 2006. A question of size? A heuristic for stepwise comparative research design. In: Rihoux, B. and Grimm, H. (Eds.). 2006. *Innovative Comparative Methods for Policy Analysis*, New York: Springer/Kluwer.
- Lewis, D. 2009. International Development and “Perpetual present” Anthropological Approaches to the Re-Historization of Policy. *European Journal of Development Research*, 21(1): 32-46.
- Lijphart, A. 1971. Comparative politics and the comparative method. *The American Political Science Review*, 65(3):682-693.
- Lipsky, M. 1980. *Street-level Bureaucracy; Dilemmas of the Individual in Public Services*. New York: Russel Sage.
- Llamas, R. and Rogers, P. n.d., *Water Crisis: Myth or reality*. Balkema Publishers, Rotterdam. In: Varis, O. and Lahtela, A. 2010. Integrated Water Resources Management along the Senegal River: Introducing an Analytical Framework. *International Journal of Water Resources Development*, 18(4).
- Lodge, T. 2003. *Politics in South Africa: From Mandela to Mbeki*. Cape Town: David Philip Publishers.
- Lukes, S. 2004. *Power: a radical view*. Basingstoke, Palgrave MacMillan, 2nd Edition (Original work by Lukes was first published in 1979).
- Lund, C. 2002. Negotiating property institutions. On the symbiosis of property and authority in Africa. In: Lund, K. and Lund, C. (Eds.): *Negotiating Property in Africa*. Portsmouth, Heinemann. pp. 11-44.
- Lund, S. and Lund, C. 2005. Power, development, and environment: an introduction. *The Journal of Transdisciplinary Environmental Studies*, 4(2).
- Made, N. 2008. Applying IWRM principles at local government level in South Africa, Case experiences from KwaZulu Natal and Gauteng. *Gabsie’s business solutions*, (n.d.): 6-32.
- Mangal, S. K. and Mangal, S. 2013. *Research methodology in behavioural sciences*. Delhi: PHI Learning Private Ltd.
- Mann, M. 1993. *The sources of social power, volume II: The rise of classes and nation-states*, pp. 1760-1914. Cambridge University Press, Cambridge.
- March, J. and Olsen J. 1989. *Rediscovering institutions*. New York, Free Press.

- Mark, R. 1996. *Research made simple: a handbook for social workers*. London: SAGE.
- Marsh, D. and Furlong, E. 2002. Ontology and epistemology in political science. In Marsh, D. and Stoker, G. (Eds.): *Theory and Methods in Political Science, 2nd edition*. Basingstoke: Palgrave.
- Mathar, T. 2008. Making a Mess with Situational Analysis? Review Essay: Adele Clarke (2005). Situational Analysis - Grounded Theory After the Postmodern Turn [37 paragraphs]. Forum
- Miles, M. B., & Huberman, A. M. 1994. *Qualitative data analysis: An expanded source book* (2nd ed.). Thousand Oaks, CA: Sage.
- Mauss, M. 1950. Essai sur le don. Forme et raison de l'échange dans les sociétés archaïques. In Mauss, M., *Sociologie et Anthropologie*, pp. 145-279, 1991. Paris: Quadrige/Presses Universitaires de France. In: Molle, F., Mollinga, P. P. and Meinzen-Dick. 2008. Water, politics and development: Introducing Water Alternatives. *Water Alternatives*, 1(1): 1-6.
- May, C.K. 2015. Visibility and Invisibility: Structural, differential and embedded power in collaborative governance of fisheries. *Society & Natural Resources*, 00(00): 1-16.
- Mayntz, in Börzel, T. A. and Risse, T. 2010. Governance without a state: Can it work? *Regulation and Governance* 4 (n.d.): 113–134.
- McCool, D. 1994. Command of the waters: Iron triangles, Federal water development, and Indian Water. University of Arizona Press, cited in: Turton, A., Henwood, R. 2002, p. 63 (see below).
- Mehta, L. and Ntshona, Z. 2004. Dancing to two tunes? Rights and market-based approaches in South Africa's water domain. Sustainable Livelihoods in Southern Africa. Research Paper 17, Institute of Development Studies, Brighton, p. 1-28.
- Meissner, R. 2013a. Who wants to be an agent? *Water SA*, 40 (1): 1-9.
- Meissner, R., Funke, N., Nienaber, S. And Ntombela, C. 2013. The status quo of research on South Africa's water resource management institutions. *Water SA*, 39(5): 721-732.
- Mendez, L. E. 2010. Devolving resources and power in a context of land and water reform organizing practices, resource transfers and the establishment of a WUA in the Thukela River Basin, South Africa. MSc thesis, Wageningen University, in: Kemerink et al. 2013, p. 246f.
- Méndez-Barrientos, L.E., Kemerink, J.S. Wester, P. and Molle, F. 2015. Commercial farmers' strategies to control water resources in South Africa: an empirical view of reform. *International Journal of Water Resources Development*, 0(0): 1-14.
- Merrey, D. J., Drechsel, P., Penning de Vries, F. W. T. and Sally, H. 2005. Integrating livelihoods into integrated water resources management: taking the integration paradigm to its logical next step for developing countries. *Reg Environ Change*, 5: 197–204.
- Merrey, D., Meinzen-Dick, R., Mollinga, P. and Karar, E. 2007. Policy and institutional reform: the art of the possible', International Water Management Institute (IWMI), in: River basin development and management, in: Water for food- Water for life, edited by David M., Comprehensive Assessment of Water Management in Agriculture, London: EarthScan.
- Merz, J. 2003. Water balances, floods and sediment transport in the Hindu Kush-Himalayas - Data analyses, modeling and comparison of selected mesoscale catchments. Unpublished PhD Thesis. Bern: Department of Geography, University of Bern, in: Sullivan and Meigh 2003, p. 14.
- Meyer, J. W. 2000. Globalization: Sources and Effects on National States and Societies. *International Sociology*, 15: 233-248.
- Middleton, B. J. and Bailey, A. K. 2009. Water Resources of South Africa, 2005 Study, WRC Report Number TT 380/08, Water Research Commission, p. 1-32.

- Milcu, A. 2011. From government to governance and onward to adaptive governance, online article:
<https://ideas4sustainability.wordpress.com/2011/12/12/from-government-to-governance-and-onward-to-adaptive-governance/> (accessed: 21.09.2015).
- Mills, J.S. 1959. *The sociological imagination*. Oxford, Oxford University Press.
- Mills, M., van de Bunt, G. G. and de Bruijn, J. 2006. Comparative Research. Persistent Problems and Promising Solutions. *International Sociology*, 21(5): 619-631.
- Msibi, I. M. and Dlamini, P. Z. 2011. Water Allocation Reform in South Africa: History, processes and prospects for future implementation. Water Research Commission Report No. 1855/1/11, pp.vi-xv.
- Mochotli, D. 2010. Emergency response plan for the eradication of water use authorisations applications backlog: LETSEMA. Presentation to the portfolio committee: Water & Environmental Affairs on 3rd November 2010.
- Molle, F. 2008. Nirvana concepts, narratives and policy models: Insight from the water sector. *Water Alternatives*, 1(1): 131-156.
- Molle, F. and Mollinga, P. 2003. Water poverty indicators. Conceptual problems and policy issues. *Water Policy*, 5: 529-544.
- Molle, F., Mollinga, P. P. and Meinzen-Dick. 2008. Water, politics and development: Introducing Water Alternatives. *Water Alternatives*, 1(1): 1-6.
- Mollinga, P. P. 2008. Water, politics and development: Framing a political sociology of water resources management. *Water Alternatives*, 1(1): 7-23.
- Mollinga, P. P., Bhat, A. and Saravanan, V. S. 2010. *When policy meets reality. Political dynamics and the practice of integration in water resources management reform*. ZEF Development Studies, Vol. 13, Bonn: LIT (Centre for Development Studies - ZEF).
- Mollinga, P. and Gondhalekar, D. 2014. Finding structure in diversity: A stepwise small-N/medium-N qualitative comparative analysis approach for water resources management research. *Water Alternatives*, 7(1): 178-198.
- Moriarty, P. and Butterworth, J. 2003. The productive use of domestic water supplies. How water supplies can play a wider role in livelihood improvement and poverty reduction, IRC, International Water and Sanitation Centre.
- Morgan, D. L. 2007. Paradigms lost and pragmatism regained: Methodological implications of combining qualitative and quantitative methods. *Journal of Mixed Methods*, 1(1): 48-77.
- Morison, P. J. 2009. Management of Urban Stormwater: Advancing Program Design and Evaluation. Doctoral thesis at the School of Geography and Environmental Science, Monash University, September 2009.
- Morris, P.M. 2006. Steven Lukes on the concept of power. *Political studies review*, 4(2): 124-135.
- Mosse, D. 1997. The symbolic making of a common property resource: history, ecology and locality in a tank-irrigated landscape in South India. *Development and Change*, 28(n.d.): 467-504.
- Mosse, D. 2006. Collective action, common property, and social capital in South India: an anthropological commentary. *Economic Development and Cultural Change*, 54(3): 695-724.
- Mosse, D. 2008. Epilogue: the cultural politics of water - a comparative Perspective. *Journal of Southern African Studies*, 34(4): 939-948.

- Movik, S. and de Jong, F. 2012. Licence to control: implications of introducing administrative water use rights in South Africa. *Law, environment and development journal (LEAD)*, 7(2): 68-78. Available at: www.lead-journal.org/content/11066.pdf (accessed: 04.08.2016).
- Mtisi, S. and Nicol, A. 2003. Appropriate for whom? Challenging the discourse on decentralisation - lessons from Zimbabwe. Alternative Water Forum, University of Bradford. Available at: http://www.bradford.ac.uk/acad/bcid/seminar/alternative_water/ (accessed: 21 August 2007).
- Mulale, K., Matema, C., Funda, X., Slater Jones, S., Njovu, D., Kanguenzi, G., Hay, D., Crookes, V. and Breen, C. (Eds.). 2013. *Community-based natural resource management in Southern Africa. An Introduction*. Bloomington: Authorhouse.
- Muller, M., Schreiner, B., Smith, L van Koppen, B., Sally, H., Aliber, M., Cousins, B., Tapela, B., van der Merwe-Botha, M., Karar, E. and Pietersen, K. 2009. Water Security in South Africa, Development Planning Division, Working Paper Series No. 12, DBSA: Midrand, p. 5-39.
- Murray, D. 2005. A critical analysis of communicative rationality as a theoretical underpinning for collaborative approaches to integrated resource and environmental management. *Environments*, 33(2): 17-35.
- Myerson, R.B. 1997. *Game Theory - Analysis of Conflict*. Harvard University Press, Cambridge.
- Najam, A. 2005. Policy Analysis for Integrated Environmental Policy. Presentations at the West Asia Regional Training Workshop. UNEP, Manama, Bahrain, 18-20 December 2005. Available at: <http://www.unep.org/ieacp/iea/training/manual/module5/1242.aspx> (accessed: 23.05.2011).
- Neumann, L. W. 2003. *Social Research Method*, 5th Edition. Wadsworth Publishing Co.
- Nicol, A. 2000. Adopting a sustainable livelihoods approach to water projects: Implications for Policy and Practice. Working Paper 133 Results of research presented in preliminary form for discussion and critical comment, Overseas Development Institute (ODI), Available at: www.odi.org.uk/resources/download/1093.pdf (accessed: 23.05.2011).
- Nkhoma, B. G., and Mulwafu, W. O. 2004. The experience of irrigation management transfer in two irrigation schemes in Malawi 1960s-2002. *Physics and Chemistry of the Earth, Parts A/B/C*, 29(15-18): 1327-1333.
- Ntshona, Z. and Lahiff, E. 2003. Rural development, institutional change and livelihoods in the Eastern Cape, South Africa: a case study of Mdudwa Village. Sustainable Livelihoods in Southern Africa Research Paper 5, Institute of Development Studies, Brighton, p. 1 – 33.
- North, D. 1990. *Institutions, Institutional Change and Economic Performance*. Cambridge, Cambridge University Press.
- NWPDF. 2015. Northwest Provincial Department of Finance. North West provincial socioeconomic review.
- Oliver, P. 2010. pers.comm. on the 25th of May during the Master of Integrated Water Management program, University of Queensland, Brisbane.
- Orne-Gliemann, M. 2008. Water user associations in South Africa: Balancing flexibility and clarity. Available at: <http://www.ceepa.co.za/index.php/63>, (accessed: 03.02. 2011).
- Ostrom, V., Tiebout, C. and Warren, R. 1961. The organization of government in metropolitan areas. *American Political Science Review*, 55(4): 831-942.
- Ostrom, E. 1992. *Crafting institutions for self-governing irrigation systems*. ICS Press, San Francisco.

- Ostrom, E. 1993. Design principles in long-enduring irrigation institutions. *Water Resources Research*, 29(7): 1907-1919.
- Ostrom, E. 2007. Institutional rational choice: An assessment of the Institutional Analysis and Development Framework. In *Theories of the Policy Process*, 2nd ed., P.A. Sabatier (ed.). Cambridge, MA: Westview Press.
- ODI. 2001. Overseas Development Institute. Economic theory, freedom and human rights: the work of Amartya Sen. ODI briefing paper 2001.
- ODI. 2002. Overseas Development Institute. 2002. Water Security Inception Report. Available at: www.securewater.org, printed in: Turton et al. 2003 (see above).
- Pahl-Wostl, C. 2009. A Conceptual Framework for Analysing Adaptive Capacity and Multi-level Learning Processes in Resource Governance Regimes. *Global Environmental Change*, 19(1): 354–365.
- Parsons, T. and Shils, E.A. 2011. *Towards a general theory of action. Theoretical foundations for the social sciences*. London: Routledge. Originally published in 1951, 1953 by Harvard Publications.
- Patton, M. Q. 2002. *Qualitative research and evaluation methods*, 3rd ed. Thousand Oaks, CA: Sage Publications.
- Pegram, G., Mazibuko, G., Hollingworth, B. and Anderson, E. 2006. Strategic Review of Current and Emerging governance systems related to water in the environment in South Africa. Water Research Commission (WRC) Report No. 1514/1/06.
- Perret, S. 2006. New paradigms, policies and governance in the water sector. In *Water governance for sustainable development; approaches and lessons from developing and transitional country*, Perret, S., Farolfi, S. and Hassan, R. (Eds). London: Earthscan.
- Peters, G. 1999. *Institutional theory in political science: the 'new' institutionalism*. London, Pinter.
- Peters, G. and Pierre, J. 2007. *Institutionalism*. Vol. 4, Sage Library of Political Sciences.
- Peters, P. E. 2004. Collective action and social conflict over land in Africa. *Journal of Agrarian Change*, 4(3): 269-314.
- Pettit, J. 2013. Power analysis. A practical guide. SIDA publications. Available at: www.sida.se/publications (accessed: 10.10.2016).
- Pienaar, G.J. and Van der Schyff, E. 2007. The reform of water rights in South Africa. *Law, Environment and Development Journal*, 3(2): 179ff.
- Pierson, P. 2000. Increasing returns, path dependence, and the study of politics. *American Political Science Review* (94)1: 251-267.
- PMG. 2016. Commission on Restitution of Land Rights Briefing power point presentation at session on Annual Reports 2014/15 to the Portfolio Committee on Rural Development and Land Reform, 5 August 2015. Available at: <https://pmg.org.za/committee-meeting/21244/> (accessed: March 2016).
- Podimata, V.M. and Yannopoulos, P.C. 2014. Evolution of game theory application in irrigation systems. *Agriculture and Agricultural Science Procedia*, 4: 271-281.
- Polkinghorne, D. E. 1995. Narrative configuration in qualitative analysis. *International Journal of Qualitative Studies in Education*, 8(1): 5-23.

- Pollard, S. and du Toit, D. 2008. Updating public participation in IWRM: A proposal for a focused and structural engagement with Catchment Management Strategies. *Water SA IWRM Special Edition 34(6)*: 707-713.
- Powell, W. W. and DiMaggio P. J. (Eds.) 1991. *The New Institutionalism in Organizational Analysis*. Chicago, IL: University of Chicago Press.
- Putnam R.D. 2000. Bowling Alone: America's Declining Social Capital. In: Crothers L., Lockhart C. (eds.) *Culture and Politics*. Palgrave Macmillan, New York.
- Quibble, G., Stein, R., Seetal, A. and N. Capayi, N. 2012. *Transforming legal access to water to redress social inequity and economic efficiency*, p. 97-119. In: Schreiner, B and Hassan, R. 2011. (see above).
- Ragin, C. C. 1997. Turning the tables: How case-oriented research challenges variable- oriented research. *Comparative Social Research*, 16 (n.d.): 27-42.
- Ragin, C. C. 2008. *Redesigning social inquiry. Fuzzy sets and beyond*. Chicago and London: University of Chicago Press.
- Rahman, M. and Varis, O. 2005. Integrated water resources management: evolution, prospects and future challenges. *Sustainability: science, practice and policy*, (1)1: 1-8.
- Reissman, C. K. 2008. *Narrative methods for the human sciences*. London & Thousand Oaks: Sage Publications.
- Ribot, J. 2009. Authority over forests: empowerment and subordination in Senegal's democratic decentralization. *Development and Change*, 40(1): 105-129.
- Ribot, J. and Peluso, N. L. 2003. A theory of access. *Rural Sociology*, 68(2): 153-181.
- Rihoux, B. 2006. Qualitative Comparative Analysis (QCA) and Related Systematic Comparative Methods. *International Sociology*, 21(5): 679-706.
- Rihoux, B. and C. C. Ragin (Eds). 2009. *Configurational comparative methods; Qualitative comparative analysis (QCA) and related techniques*. Applied Social Research Methods Series, Vol. 51. Thousand Oaks, CA: Sage.
- Rittel, H. W. J. and Webber, M. M. 1973. Dilemmas in a general theory of planning. *Policy Sciences*, 4(9): 155 - 169.
- Ritzer, G. 2013. *Introduction to Sociology*. Thousand Oaks: Sage, p. 36-156.
- Rogers, P. and Hall, A. 2003. Effective water governance. GWP Technical Committee Background Paper No. 7. Stockholm: Global Water Partnership. Available at: www.gwpforum.org (accessed: 10 March 2011).
- Rondinelli, A., Denis, A., Nellis, J. R. and Cheeme, G. S. 1983. Decentralization in Developing Countries: A Review of Recent Experience. World Bank Staff Working Papers Number 581, Management and Development Series Number 8, The World Bank, Washington.
- Rosenau, J. N. 1990. *Turbulence in world politics: a theory of change and continuity*. Princeton University Press, Princeton, NJ.
- Ross, R. 1983. *Cape of torment: slavery and resistance in South Africa*. London: Routledge & Kegan Paul.
- Roux, D. 2011. pers.com. on the 03.04.2011 during the Master of Integrated Water Management program, Monash University South Africa.
- Roux, D., J. Nel., J. L., MacKay H. M. and Ashton P. J. 2006. Cross Sector Policy Objectives for Conserving South Africa's Inland Biodiversity, WRC Report No TT 276/06.

- RSA. 1996. Republic of South Africa, Constitution of the Republic of South Africa. Available at: <http://www.info.gov.za/documents/constitution/1996/index.htm> (accessed: 04.02.2011).
- Rueschemeyer, D. 2003. Can one or a few cases yield theoretical gains? In Mahoney, J. and Rueschemeyer, D. (Eds.). *Comparative historical analysis in the social sciences*. Cambridge, MA: Cambridge University Press.
- Rueschemeyer, D. 2009. *Usable Theory, analytic tools for social and political research*, Princeton University Press, New Jersey.
- Saar, M. 2010. Power and critique. *Journal of power (currently known as Journal of political power)*, (3)1: 7-20.
- Sabatier, P., W. Focht, M. Lubell, Z. Trachtenberg, A. Vedlitz, and M. Matlock (eds.). 2005. *Swimming upstream: Collaborative approaches to watershed management*. Cambridge: MIT Press.
- Saravanan, V. S. 2010. Movers, shakers and power brokers. Agents in negotiated water management in the Indian Himalayas, in: Mollinga, P. P., Bhat, A. and Saravanan, V. S. 2010. *When policy meets reality. Political dynamics and the practice of integration in water resources management reform*. ZEF Development Studies, Vol. 13, Bonn: LIT (Center for Development Studies - ZEF).
- Saravanan, V. S., McDonald, G. T. and Mollinga, P. P. 2008. Critical Review of Integrated Water Resources Management: Moving Beyond Polarised Discourse. ZEF Working Paper Series, Department of Political and Cultural Change Centre for Development Research, University of Bonn.
- Saruchera, D. Emerging Farmers in Water User Associations. Cases from the Breede Water Management Area. Master thesis submitted to the University of the Western Cape.
- SATI. 2014. Creating a progressive, equitable and sustainable table grape industry. Statistics booklet 2013/2014. www.satgi.co.za/Media/.../2013-2014-SATI-Statistical-Booklet.pdf (accessed: 20.11.2016).
- Schapera, I. 1984. *The Tswana: a supplementary by John L. Comaroff and a supplementary bibliography by Adam Kuper*. KPI and the International African Institute Bodmin.
- Schreiner, B., Van Koppen, B., and Khumbane, T. 2002. From bucket to basin: a new water management paradigm for poverty eradication and gender equity Pages 127-140 in A. Turton and R. Henwood (editors), *Hydropolitics in the developing world: a Southern African Perspective*. African Water Issues Research Unit, Centre for International Political Studies, University of Pretoria.
- Schreiner, B., Pegram, G. and Von der Heyden, C. 2009. Reality check on water resources management: Are we doing the right things in the best possible way? Development Planning Division, Working Papers Series No.11, DBSA: Midrand.
- Schreiner, B. and Hassan, R. 2011. *Transforming water management in South Africa. Designing and implementing a new policy framework*. Global Issues in Water Policy 2. Berlin: Springer.
- Schreiner, B. 2013. Viewpoint - Why has the South African national water act been so difficult to implement? *Water Alternatives*, 6(2): 239-245.
- Schurink, W., Fouché, C. B. and De Vos, A. S. 2011. Qualitative Data Analysis and Interpretations. In De Vos, A., Strydom, H., Fouché, C.B. and Delpont, C. S. L. (Eds.), 2012. *Research at Grass Roots. For the social sciences and human service professions, 4th ed.* Pretoria: Van Schaik.

- Schwabe, C. 2004. Fact Sheet: Poverty in South Africa, Human Sciences Research Council Fact Sheet: Poverty in South Africa. Available at: <http://www.sarpn.org.za/documents/d0000990/> (accessed: 23.05.2011).
- Schwandt, T. A. 2007. *The Sage Dictionary of Qualitative Inquiry*, 3rd ed., Thousand Oaks, California: sage Publication, Inc.
- Scoones, I. 1998. Sustainable Rural Livelihoods: A. Framework for Analysis, IDS Working Paper 72. Available at: <http://graduateinstitute.ch/webdav/site/developpement/shared/developpement/mdev/soutienauxcours0809/Gironde%20Pauvrete/Sustainable%20Rural%20Livelihoods%20-%20Scoones.pdf> (accessed: 12 March 2013).
- Seekings, J. and Natrass, N. 2005. *Class, Race, and Inequality in South Africa*. Yale: Yale University Press.
- Sehring, J. 2009. Path dependencies and institutional bricolage in post-Soviet water governance. *Water Alternatives*, 2(1): 61-81.
- Sen, A. 2005. Human Rights and Capabilities. *Journal of Human Development*, 6(n.d.): 151-166.
- Sen, A. 2009. *The Idea of Justice*. Allan Lane and Harvard University Press.
- Seshoka, J.; de Lange, Willem; Faysse, Nicolas. 2004. The transformation of irrigation boards into water user associations in South Africa: Case studies of the Lower Olifants, Great Letaba and Vaalharts water user associations. IWMI Working Paper 072, <http://dx.doi.org/10.3910/2009.259>.
- Shah, T. 2000. Limits of leapfrogging: issues in transposing successful river basin management institutions in the developing world. IWMI technical paper, India Program Office, International Water Management Institute. Colombo, Sri Lanka.
- Shankland, A. 2000. Analysing policy for sustainable livelihoods, Institute of Development Studies (IDS), IDS research report 49. Sussex, England.
- Sharma, A. K. 2013. (Mod-01 Lec-09 State-III: The concept of power; published by NPTEL RD, lecture on the concept of power. Available at: <https://www.youtube.com/watch?v=ryIKZFzahHM> (accessed: 29. 10.2015).
- Skopcol, T. 2003. Doubly engaged social science. The promise of comparative historical analysis. In Mahoney, J. and Rueschemeyer, D. (Eds.). *Comparative historical analysis in the social sciences*, pp. 407-428, Cambridge: Cambridge University Press.
- Smelser, J. 2003. On Comparative Analysis. Interdisciplinarity and Internationalization in Sociology. *International Sociology*, 1(18): 643-657.
- Stake, R. E. 2006. *Multiple case study analysis*. New York: Guilford Press.
- Stake, R. 2005. Qualitative case studies. In Norman K. Denzin & Yvonna S. Lincoln (Eds.), *Qualitative research* (3rd ed., pp.433-466). Thousand Oaks, CA: Sage Publications.
- Stake, R. 2006. *Multiple case study analysis*. New York, NY: Guilford Press.
- StatsSA. 2014. Available at: <https://www.statssa.gov.za/census01/Census96/HTML/press/Part016.html> (accessed: January 2014), also at: <http://www.statssa.gov.za/?m=2014> (accessed: April 2015).
- StatsSA. 2017. Available at: http://www.statssa.gov.za/?page_id=4286&id=10966 (accessed: August 2017).
- Steinberg, P. F. and VanDeveer, S. D. (Eds). 2012. *Comparative environmental politics. Theory, practice and prospects*. Cambridge MA and London: The MIT Press.

- Stern, G. 2000. *The structure of international society: An introduction to the study of International Relations*. London: Pinter.
- Strauss, A. and Corbin, J. 1998. *Basics of qualitative research: techniques and procedures for developing grounded theory*, 2nd ed. Thousand Oaks, CA: Sage Publications.
- Stretton, H. 1969. *The political sciences: General principles of selection in social science and history*. London: Routledge & Kegan Paul.
- Strydom, A. and Bezuidenhout, R.-M. 2014. *Qualitative data collection*. In: du Plooy-Cilliers, F., Davis, C. and Bezuidenhout, R.-M. 2014. *Research matters*. Cape Town: Juta.
- Stuart - Hill, S. 2014. Personal communication at a Water Research Commission conference workshop on "How to make IWRM fit for practice?", November 2014, Pretoria.
- Sullivan, C. A., Cohen, A., Faurès, J. M. and Santini, G. 2003. The Rural Water Livelihoods Index. Working Paper, FAO publications.
- Swatuk, L. 2008. A political ecology of water in Southern Africa. *Water Alternatives*, 1(1): 24-47.
- Swatuk, L. A. 2005. Political challenges to implementing IWRM in Southern Africa. *Physics and Chemistry of the Earth*, 30: 872-880.
- Swatuk, L. A. 2010. The state and water resources development through the lens of history: A South African case study. *Water Alternatives*, 3(3): 521-536.
- Swatuk, L. and Wirkus, L. 2009. Transboundary Water Governance in Southern Africa: An Introduction, in: Swatuk, L., Wirkus, L. (2009) (Eds.): *Transboundary Water Governance in Southern Africa - Examining Underexplored Dimensions. Sustainable Peace and Global Security Governance*. Baden-Baden, pp. 11-31.
- Swyngedouw, E., Kaika, M. and Castro, E. 2002. Urban water: a political ecology perspective. *Built environment* (special issue on water management in urban areas), 28(2): 124-137.
- Swyngedouw, E. 2006. Power, water and money: exploring the nexus. In: UNDP. 2006. Human Development Report 2006. Occasional paper 2006/14.
- Tapela, B. 2012. Social water scarcity and water use. Water Research Commission of South Africa, WRC Report 19401/11.
- Tapela, B. 2002. The challenge of integration in the implementation of Zimbabwe's new water policy: case study of the catchment level institutions surrounding the Pungwe-Mutare water supply project. *Physics and Chemistry of the Earth*, 27(n.d.): 993-1004.
- Tempelhof, J. and Motloung, S. 2014. The River as an Artefact: Interpreting the Groot Marico and its People in the 21st Century. *South African Museums Association Bulletin (SAMAB)*. 35: 2012/2014.
- Tesch, R. 1990. *Qualitative research*. New York: Falmer.
- Thelen, K. 1999. Historical institutionalism in comparative politics. *Annual Review of Political Science* 2: 369-404.
- Theron, J. 2010. Sour grapes. *Law, democracy and Development*, 14: 1-23. Available at: <http://dx.doi.org/10.4314/ldd.v14i1.2> (accessed: 18.12.2014).
- Toru, M. 2003. Plurality in „Acting in Concert“. *Archiv für Rechts- und Sozialphilosophie*, 89(4): 538-550.
- Tropp, H. 2006. Water Governance Challenges. In: *The United Nations World Water Development Report 2: Water, a shared responsibility*. United Nations Educational, Scientific and Cultural Organization (UNESCO), Paris.

- Turton, A. and Henwood, R. 2002. *Hydropolitics in the developing world. A Southern African Perspective*, African Water Research Unit (AWIRU), Pretoria: University of Pretoria.
- Turton, A., Nicol, A., Allan, T., Earle, A., Meissner, R., Mendelson, S. and Quaison, E. 2003. *Policy options in water – stressed states. Emerging lessons from the Middle East and Southern Africa*, African Water Research Institute (AWRI) - ODI publications 2003.
- UNDP. 2000. Human Development Report 2000: Human Rights and Human Development, New York.
- UNEP. 2006. Water: a crisis of governance, Available at: <http://www.unep.org/Documents.Multilingual/Default.asp?DocumentID=471&ArticleID=5215&l=en> (accessed: 15.01.2014).
- UNDP. 2006. Beyond Scarcity. Power, poverty and the global water crisis. World Water Development Report pp. 1-24.
- UNPAN. 2007. The Vienna declaration on building trust in government. Made at UN Headquarters, Vienna 26 - 29 June 2007.
Available at: unpan1.un.org/intradoc/groups/public/.../un/unpan026677.pdf (accessed: April 2014).
- UNESCO. 2015. Water for a sustainable world. World Water Development Report, chapter 15 (stewardship and governance), p. 111.
- UN-Water 2008. Status Report on IWRM and Water Efficiency Plans for CSD16 Available at: www.unwater.org/downloads/UNW_Status_Report_IWRM.pdf (accessed: 04.02.2014).
- Umvoto Africa Pty. Ltd. 2011. Reconciliation strategy for DeDoorns and Orchards.
- Uphoff, T. 2002. Role of local communities and institutions in integrated rural development, Report of the APO Seminar on Role of Local Communities and Institutions in Integrated Rural Development held in Islamic Republic of Iran, 15-20 June 2002. Asian Productivity Organization, 2004. Available at: www.apo-tokyo.org/publications/files/pjrep-icd-se-3-01.pdf (accessed: August 2013).
- USAid – website. Available at: http://www.usaid.gov/our_work/environment/water/water_crisis.html (accessed: 26.02.2011).
- USC. 2016. University of Southern California, Research guides. Available at: <http://libguides.usc.edu/writingguide/qualitative> (accessed: 25.04.2016).
- van der Zaag, P. 2005. Integrated Water Resources Management: irrelevant buzzword or key concept? *Physics and Chemistry on Earth*, 30: 867-971.
- van Koppen, B., Schreiner, B. and Fakir, S. 2011. The political and economic context and changing water policy in South Africa post-1994. In Schreiner, B. and Hassan, R. 2011. *Transforming water management in South Africa. Designing and implementing a new policy framework*. Global Issues in Water Policy 2. Berlin: Springer.
- VanWynsberghe, R. and Khan, S. 2007. Redefining case study. *International Journal of Qualitative Methods*, 6(2): 1-10.
- Van der Walt, M. 2011. The concept "beneficial use" in South African water law reform. Doctoral thesis 2011 North-West University (Potchefstroom). Available at: https://www.researchgate.net/publication/258239832_Van_der_Walt_MM_%27The_concept

- _beneficial_use_in_South_African_water_law_reform%27_Unpublished_LLD_thesis_2011_No
rth-West_University_Potchefstroom (accessed: 15.01.2017).
- van der Walt, L. 2015. Beyond 'White Monopoly Capital': Who owns South Africa? *South African Labour Bulletin*, 39(3): 39-42.
- Vaughan, S. and K, Tronvoll. 2003. The Culture of Power in Contemporary Ethiopian Political Life, Sida Study No. 10, Stockholm.
- Walliman, I., Tasis, N.C. and Zito, G. V. 1977. On Max Weber's definition of power. *Journal of Sociology*, 13(3): 231-235.
- Walmsley, R.D., J.J. Walmsley, and S. M. 1999. National State of the Environment Report - South Africa. Freshwater systems and Resources [Online]. Available by Department of Environmental Affairs and Tourism. Available at:
<http://www.ngo.grida.no/soesa/nsoer/issues/water/index.htm> (accessed: 25.03.2011).
- Warner, J.F. 2006. More sustainable participation? Multi-stakeholder platforms for integrated catchment management. *Water Resources Development*, 22(1): 15-35.
- Waterwatch. 2013. Water use efficiency of table and wine grapes in Western Cape, South Africa. Available at: www.WaterWatch.nl (accessed: 28.07.2014).
- Weber, M. 1925. *Wirtschaft und Gesellschaft; Grundriss der Sozialökonomik*, Abteilung III. J. C. B. Mohr (Paul Siebeck): Tuebingen.
- Wilson and Perret. 2010. Participation in Water Resource and Services Governance in South Africa: Caught in the Acts. In: Berry K., Mollard E. 2010. Social Participation in Water Governance and Management: Critical and Global Perspectives, Chapter: 9. EarthScan, pp.325-353.
- Woodhouse, P. 2002. Natural resources management and chronic poverty in sub-Saharan Africa: an overview paper. *CPRC Working paper 14*. Available at:
http://www.chronicpoverty.org/uploads/publication_files/WP14_Woodhouse.pdf (accessed: 19.01.2016).
- World Bank. 2017. World Development Report 2017: Governance and the Law. Washington, DC. doi:10.1596/978-1-4648-0950-7. License: Creative Commons Attribution CC BY 3.0 IGO.
- WWC. 2006. Ministerial declaration of the Fourth World Water Forum, Mexico. Available at:
<http://www.worldwaterforum4.org.mx/files/Declaraciones/MinisterialDeclaration.pdf> (accessed: 19.01.2014).
- Yin, R. 2014. *Case study research. Design and methods*. 5th edition. Los Angeles: SAGE Publications.

APPENDICES

In Chapter three I have laid out the methods of this research project stating that a sound case study has to find a balance between the general context and specificity. The context described in every sub-chapter one of each case study is further presented in much greater detail in the contextual overview tables of factors influencing peoples' lives and livelihoods in both study areas. In the case of the Hex River Valley these tables were supplemented by analytic narratives exemplifying a typical day in the life of each water use group. In order to incorporate the dimension of accessing water through the WUA as an institution of water governance, I have added a 'political' capital to the Sustainable Livelihoods Framework's categories, which I used to organise the findings in the tables below.

APPENDIX 1: CONTEXTUAL OVERVIEW TABLE SUMMARIZING RELEVANT LIVELIHOOD FACTORS OF THE POOR LIVING IN THE SETTLEMENTS IN THE HEX RIVER VALLEY

Agential resources and capabilities (RnCs)	Combined⁸⁷ empirical findings: Agential RnCs in the context of poor people’s livelihoods living in the settlements of Orchards, Sandhills, DeDoorns East and Stofland.	Individual participant statements (Interviews were conducted in April, September and December 2014)
Human	<ul style="list-style-type: none"> • The well-being and livelihoods of people from the settlements was described as: “not nice”; “no good”; “very hard”; “we are suffering a lot”. • A daily struggle for food was evident in all of the four settlements. All participants were constantly worried about how to get food or about not having enough food for their family and were suffering from hunger and malnutrition. Towards the end of the month hunger became a ‘constant companion’ of the participants. The town of DeDoorns is recorded to have the highest malnutrition rates in country and high rates of TB and HIV were prevalent. • Mental well-being and bodily health of participants living in the settlements were generally in a poor condition: a lack of money for medication, long distances to the next hospital, the relatively high costs for a local taxi or ambulance services and the limited capacities of the small local clinic were prevalent. 	<ul style="list-style-type: none"> • “Life is not nice here” (Stofland). • “We are suffering, we are suffering a lot. Nothing has changed; no jobs no nothing; kids are hungry. Life has no future here (ibid.)” • “The only job opportunities are on the farms. Some jobs exist in the packing [of the grapes, some in Worcester], but that’s it” (DeDoorns East). • “We can’t live on these wages, it’s not

⁸⁷ In this case, and in the following overview tables, *combined* means aggregating findings from different groups, with again different social stratifications from the rural, traditional village of Koffiekraal, the area described with Skuinsdrift and the rural town of Groot Marico. Skuinsdrift describes a large old colonial farm area of hundreds of hectares, which was developed on formal tribal land of the Tswana and Hurutse people. Within these three areas, different agricultural development projects exist funded by different national and international donor organisation, the University of South Africa and self-made projects initiated by the local people. These are the Groot Marico Fresh Produce Project in the town of Groot Marico (South African Dept. of Agriculture); the Skuinsdrift Rural Development Project (local organisation), in which a group of emerging farmers farming after the ‘mentorship-model in Skuinsdrift and the Madikwe Rural Development Project (MDRP). However, aggregating the empirical findings into one single table, levels existing social differences between the groups and individuals. Such reduced degree of social differentiation is a methodological compromise between providing necessary contextual width and individual depth, between elaborating on context and specificity, while adhering to the conditions of academic latitude of a PhD thesis. This is deemed appropriate, because the focus of this thesis lays on the question of which resources and capabilities (determined by their livelihoods) are endowed to a group of water users and how that enables them to utilise formal mechanisms of water governance to obtain water for agricultural purposes. It is not an in-depth anthropological study, although it might bear elements of methods common in anthropology (Mollinga and Gondahlekar 2010).

	<p>None of the research participants could afford any of the private sector health cover. A public health care system did not exist in South Africa. Access to hospital and or ambulance services was described as too expensive.</p> <ul style="list-style-type: none"> • A detrimental water, sanitation and hygiene situation was evident with overflowing chemical toilets and very limited waste disposal facilities. A constant stream of sewage and wastewater running through the narrow alleys in between the dwellings of Sandhills, Orchards and Stofland. All participants complained about often being sick with flu, upset stomachs and diarrhoea. • The children, who played in the streets and narrow alleys in-between the shacks, were more often sick than their parents. This oftentimes presented a financial and timely burden for the parents. • Participants had only limited formal education; and had only limited knowledge of the English language. Participants ranged from having no education at all, to formal education of grade 5. None had any higher education. Understanding written English presented a challenge to all participants, although to different degrees; literacy was limited in all the settlements. • Limited or no knowledge about local or regional water governance (WUA or CMA) institutions existed. None of the participants had knowledge about the NWA 1998, the NWRS 2, the NWPR 2013 or any other current or future policies, plans or strategies of water governance in the area. None, of the interviewees had any knowledge about a WUA or a CMA. • The ways in which access to water for productive purposes was organised in the Hex Valley were not known to the participants. • Participants had no knowledge about the formal procedures required for establishment and operation of the WUA. As such, none of the participants possessed knowledge about the political vision behind WUAs as a mechanism of transformation. • No knowledge existed about the three water storage dams in the Hex Valley. The existence of the two dams in the Matroosberg Mountains and the Osplaas dam were unknown. 	<p>enough” (DeDoorns East).</p> <ul style="list-style-type: none"> • “We don’t have transport and only little education” (DeDoorns East). • “For you it’s easy. But I am very hungry as I am sitting here. What have you eaten today?” (Orchards). • “The other day I heard about a river meeting, but I did not go. I was busy trying to search for food” (Stofland). • “Most of the day I am trying to get the foods, what else must me do?”(Orchards). • “I can speak it [English language], but some of the words I don’t know. Reading for me is not easy” (De Doorns East).
<p>Social</p>	<ul style="list-style-type: none"> • During the time of grape harvest between April and November, in all four settlements lived a high number of agricultural migrant workers mostly from Zimbabwe and Botswana and Nigeria. The four settlements ‘swelled up’ during this time. Reliable official numbers of inhabitants did not exist. The municipality explained to be unable “keep track of them” due to limited human resources. Unofficial estimates, however, range from 30 000 to 50 000 inhabitants for Stofland alone, a settlement initially planned for around 6 000 people. 	<ul style="list-style-type: none"> • “There are so many people here: too much for the little that is there. I don’t even have enough water for myself, how can I give to others?” (De Doorns East) • “There is lots of crimes here; even the

	<ul style="list-style-type: none"> • The depriving rhythm of daily farm labour was the all-decisive element for the poor living in the settlements. They worked 10 -14 hours, from 06:00 in the morning to 20:00 at night for a daily salary of Rand 105 (approx. 10 AUD). In many instances both parents of a household with children went to work on the farms, as the whole family depended on the income. This was a typical situation for approximately 20 000 seasonal farm workers in the Hex Valley: children of all ages were left unattended at home, because both parents work on the farms and the family could not afford to skip one daily salary. Entering the settlements during work hours, I found them deserted; many children and some elderly people remained. Participants explained this was due to the limited availability of childcare facilities, but more so to the relatively high costs (R50 per day and child) of childcare in the settlements, if existent at all. • I found children searching for food on local waste dumpsites or playing in or near the stream of sewage. I also saw some under the age of 15 working on the farms. However, many families had no other option, but to rely on their children augmenting the household income. The Department of Labour currently investigated accounts of child labour on some of the farms in the Hex Valley. • Drug abuse, among children and teenagers in between the ages of seven and 18 was visible in all four settlements. Local drug lords targeted the vulnerable children, as either consumers or vendors of drugs. Parents said to have little influence, as they were away for work on the farms during the day. • Most people living in the settlements invested their physical energy in a daily search for food, if not working on the farms. Little time existed for social contacts, going to church or other social activities, as well as to attend food gardens. • A low degree of organisation or none at all between people in the settlements was apparent. Besides the local “DeDoorns farm workers association” and a black upcoming farmers association in a neighbouring village, there were no collective activities or organisations around issues of water. A perception was prevalent that this was a domain of the municipality. • The existence of WUA as official government institution governing water was not known among participants. 	<p>young are doing the drugs” (Stofland).</p> <ul style="list-style-type: none"> • “In the settlement next to the town [DeDoorns East], if you go in there between 07:00 and 18:00 you will hardly find a soul in there. Except children, they are left there (Breede Valley Municipality, 2014 Worcester). • “No we are not organised [in terms of water]” (EF 2). • “I think that is there problem, they are not organised, there are no formal meetings” (CEO HVWUA 2014). • “People work together to a certain degree with the ones next to them, but if you struggle with poverty, people tend to look after themselves (Senior manager Breede Valley Municipality 2014)”. • “The kids are the worst. And those that work on the farms, I feel so sorry for them. Jo, this life here (...) (2014, Orchards). • “The situation in DeDoorns and Stofland is a social disaster” (Commercial farmer CF D 2014).
	<ul style="list-style-type: none"> • Lack of employment opportunities besides agriculture was prevalent. • In the settlement of Stofland, 80 % unemployment was the normality. Throughout the Valley unemployment rates of 80 - 90 % were found, excluding the farm workers. Employment on the farms was available only during the harvest season from April to November. Besides these 4 - 5 months in the 	<ul style="list-style-type: none"> • “The people here have only work for four to five months. But I would say per two households of 4 or 5 people there is only one that has work, the

<p>Economic/ Financial</p>	<p>Hex Valley no other economic sector offering employment opportunities existed.</p> <ul style="list-style-type: none"> • During the harvest time around 40% of the people living in poor settlements worked on the farms of the commercial farmers. The official numbers list 16 000 seasonal farm workers for the year 2014. Participants explained however this number would be rather 20 000 to 25 000. • Traveling to the larger town of Worcester to seek work was not an option to all participants due to a lack of private means of transport and not having enough money to pay for transport with the local taxis. • A daily salary of R 80 - 100 for 10 - 14 h of physically hard labour was the norm. The most frequent job was work as a ‘picker’, picking the grapes from the vineyard (please see the analytic narrative in the next section for a detailed account of a day’s work as a picker). Both men and women worked the same hours. Women however tended to work in the subsequent packaging facilities (also located on the farms) for the same hourly salaries. • Access to finance was a great challenge. By the time the research started in 2013 the daily wage of farm workers was R 69 a day. After a month of sometimes violent protests in the Hex River Valley in 2013, the minimum wage was raised to R 105 per day. However, all of the participants explained that farmers would sometimes pay only R 80 or R 90, whereas some other farmers, as the exception, payed R 140 a day. All participants, however, described that being sick for a day would mean to lose the job, because someone else would be ‘hired’ immediately. • None of the participants had a stable and reliable income. None of the participants had sufficient income to save money. Lending money from neighbours and friends was common strategy to overcome shortages, especially in the off-harvest season. • Access to private loans and credit was not existent for the participants. Without any collateral assets, the poor were regarded as “high-risk candidates” (Staff of local bank, conversation September, 2014). • Some of the participants from the poor settlements expressed not to have any other livelihood option than to steal grapes from the large fields which surround the settlements trying to sell them along the N1 highway illegally to make a small amount of money while facing the risk of being detained in prison. Some relied on food donations from the town’s only “familie kombuis” (family kitchen), which sold cooked meals to local customers. This meant the poor sat in front of the shop at the end of the day until they received either ‘left overs’ of the kitchen or were chased away by the shop owners or the police. • Another common livelihood strategy was to receive funding from government in form of grants for 	<p>others live as dependants of this guy” (Senior manager Breede Valley Municipality 2014 Worcester).</p> <ul style="list-style-type: none"> • “Most people work during the season. They make their living from what jobs they can get on the farms. They are very depended on these jobs, because they have to buy food and some medicine. This is very difficult.” (Translators voice, Stofland 2014). • “Sometimes they (the commercial farmers) pay a hundred, sometimes eighty, or seventy. If you complain, they chase you away a next day a Zim guy [Zimbabwean] gets the job, because they work for less. They are even more desperate than us” (Stofland 2014). • “I am making a living out of nothing. My husband died and I do not have a work. So I depend on the children” (Orchards 2014). • “What keeps them going is a R 320 grant per month for a baby. And most of the money is needed for the baby and only if there is something left they can use it for their own food” (Senior manager Breede Valley Municipality 2014). • “The only source of income besides the one from her children [government
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	<p>children. This grant was in many instances the only income for a household of 4 or more people.</p> <ul style="list-style-type: none"> • None of the participants possessed land. People lived from hand to mouth with some occasional exceptions in DeDoorns East, where for example also police officers or other people with a permanent job lived. However, all of the research participants explained they were unable to save money. • None of the participants had sufficient income to send their children to the local school. 	<p>grants] working on the farm is by taking care of children of others.”(Translators voice Orchards, 2014).</p> <ul style="list-style-type: none"> • “To go to the municipality costs money for the taxi, so we stay home and use the money to buy food” (Orchards 2014). • “This [the livelihoods determined by low skilled farm labour in the Hex Valley] is worse than Apartheid, man. We were low back then, but now we are nothing. It's all about the monies [money] now” (Stofland 2014).
<p>Physical</p>	<ul style="list-style-type: none"> • Forms of housing ranged from shacks of corrugated iron, wood, plastic and whatever material was available (Sandhills, Orchards, Stofland), over RDP houses (parts of Stofland and DeDoorns East) to brick houses in a few areas of DeDoorns East. To all of the participants of this study a form of shack-like dwelling was their home. • The standard of water supply infrastructure was different within settlements. Sanitation in the semi-formal parts of DeDoorns East and Stofland had improved through the installation of flush toilets in some houses. In other areas of DeDoorns East as well as some areas in Stofland one communal tap per four plots was the norm, in principle. In practice, many taps were broken and three of four times the people than planned for shared a communal tap. • In principle, for one plot one a chemical toilet was available. However, one plot often comprised 4 shacks and one shack oftentimes was home to a family of 4 people. This meant that sometimes 20 - 40 or more people of different age shared one chemical toilet. Overflowing toilets were evident throughout the area. However, people in Sandhills, Orchards, and Stofland faced serious challenges in terms of sanitation and hygiene. Chemical toilets were not being emptied frequently causing overflowing sewage to run through the settlements. Waste disposal was either in many instances dysfunctional or not appropriate for the amount of people. This negatively impacted on the health of 	<ul style="list-style-type: none"> • “They (the chemical toilets) spill and the dirty stuff is running here where the children play. It makes them sick and the smell is not nice. The flies are also everywhere here.” (De Doorns East 2014) • “The clinic [in DeDoorns East] is always full of children that are sick with loose tummies, severe diarrhoea, and also lung infections from the cold, cos they do not have adequate clothing” (Nurse at the small, local hospital 2014)” • “We don’t have transport (...) (DeDoorns East 2014). • I will never be able to pay for this. What must me do. [...]. Water, oh god, it is a

	<p>people living in all of the settlements.</p> <ul style="list-style-type: none"> • In Sandhills and Orchards only a limited number of in-house taps existed. Taps in the backyard I found more frequently⁸⁸ and communal taps to access water for productive purposes were the most prevalent. • Some backyard food gardens existed in DeDoorns East on a small-scale (3 - 6 sqm). Vegetables, mostly cabbage, carrots, beetroot and spinach, were grown by the people to supplement the food bought from the local shops in DeDoorns or from local food vendors. • Nevertheless, a prevalent lack of transportation meant significantly inhibiting the mobility of participants from all settlements. This negatively impacted on their ability to access local food shops in DeDoorns. To take taxi from Sandhills to the town centre of DeDoorns costed R 10 – 15 for a distance of 3 - 4 Km. This made many of the inhabitants of Sandhills and even Orchards dependent on small mobile food vendors, who offer the basic food items (eggs, flour, milk, tomatoes etc.) in many instances for higher price than in the local supermarkets in the town of DeDoorns. • None of the research participants had a computer, tablet or smart-phone with internet access. 	<p>lot of money. (Orchards 2014)</p>
<p>Political</p>	<ul style="list-style-type: none"> • There was no participation of poor people living in the settlements in water-related decision-making processes on municipal or provincial level. None of the participants had knowledge about the NWA 1998, the NWRS II, the NWPR 2013, or the existence of the HVWUA or about political representation on the decision making board of the WUA. • The elected ward councillor from the municipality was known to participants, but he would have not “shown up for months”. However, the ward councillor was not represented on the WUA management committee (MANCO). The municipal manger, who was also an elected representative for the 	<ul style="list-style-type: none"> • “A water association? I don’t know about these things” (Stofland). • “A WUA? What is this? It is the white guys I think” (DeDoorns East). • “This guy [the municipal ward councillor], he only comes before the elections, that’s it” (Orchards).

⁸⁸ Many communal tabs in all the settlements were dysfunctional. A functioning one was thus oftentimes used by neighbouring households either with or without permission of the plot holder. Oftentimes the owner of a small space with and RDP house rented out whatever piece of land next to his RDP house was available to others. A reliable calculation of the number inhabitants of the settlements with access to water from a communal standpipe or their own tap in the backyard was not possible. The municipal water manager expressed in 2015: “as soon as we have the numbers [for forms of water access per household], they are out-dated”. The ability of the Breede Valley municipality to rely on existing hydrological data records was severely limited, as the Breede Valley Municipality had only one staff member for bulk water services for the whole of the Breede Valley.

	<p>settlements, attended MANCO meetings once in two months, if he “can find the time”, but rather twice per half a year.</p> <ul style="list-style-type: none"> • No knowledge existed about the fact that water was legally allocated per hectare of land owned according to historical water entitlements (Schedule 4 license of Existing Lawful Use). A total lack of awareness of water institutions (besides the municipality) was evident. 	<ul style="list-style-type: none"> • “Striking is the only power that we have. Otherwise we are powerless” (Sandhills).
<p>Natural</p>	<ul style="list-style-type: none"> • None of the people in the four settlements possessed land. • Five out of 10 visited larger houses in DeDoorns (two rooms with each around eight square meters) had a small plot of one to two, on which they had planted some vegetables, for example, spinach, beetroot, cabbage and carrots. For watering the little food gardens, people used either their tap water (if a tap existed in the household) or the communal standpipes. All of the participants expressed a strong need and interest to get more water to expand the food garden. • Water for consumptive use⁸⁹ was supplied by the municipality to Orchards, DeDoorns East and Stofland via pipeline from the municipal sources in the Hex. However, Sandhills was supplied by the WUA with raw water directly via pipeline into a storage reservoir. This water did not comply with SA drinking water standards. • Water quality supply was described as ‘ok’, but with approximately five interruptions per month. During those times (5 - 24 hours) water was sometimes supplied by tanker. Sometimes there was simply no water in Sandhills or Orchards and people climbed over the fence of the local school to get water from the school’s standpipes. 	<ul style="list-style-type: none"> • „The quality of the water is ok here most of the time. But I find that paying for it, I can’t do” (Orchards).

⁸⁹In international academic literature and in legal and policy-related documents of the South African government I often found a distinction between ‘consumptive water’ and ‘drinking water’ or ‘household water’ and ‘water for productive purposes’ or ‘water for economic use’. Such differentiation did not exist in the everyday realities of the poor settlements in the Hex River Valley. Water supplied to the settlements by the municipality was used for multiple purposes such as watering backyard gardens, a goat or a pig, as well as for sanitation purposes and washing clothes and cooking.

ANALYTIC NARRATIVES

The next section describes a typical livelihood of a poor family living in one of the settlements.

The names in the three analytic narratives following each livelihood table are fictional synonyms and not real names. The times, numbers, locations, activities, resources, perceptions, experiences in this narrative are empirical aggregates based on findings from research interviews with participants of this study. These findings were enriched with personal observations and findings from informal conversations with members of the three groups. They are evidence-based, analytic stories, which stand exemplary of each of the water user group's livelihoods characteristics and thus reflect their 'resources and capabilities to do something' (power) as well as their linkages to the Water User Association and other structures within the local, historical context in the light of accessing water.

APPENDIX 1.1 ANALYTIC NARRATIVE I - THE DAY OF A PICKER IN DE DOORNS

Julius Matabalesi gets up at around 05:00 in the morning when his two children are still sleeping. His wife Rosalyn normally gets up as well as she also prepares to go to work. One child of eight years will go to the local school at 07:30. Education is not free; it costs R 100 per household per month. Sometimes the family can afford the day-care in the local 'creche' (childcare) for the younger child of four years, but most of the days it will be left unattended in the informal settlement until the parents return from work. Maybe a relative might come looking after the child for a while, maybe not. The parents have to leave their children behind, because they cannot afford to miss one daily salary - work brings in money and money puts food on the table. Julius and his wife are both 27 years of age.

Julius leaves the house to get some water from the communal tap approximately 50 meters away to make some instant coffee, if the family had enough money to buy some. This morning, however, he had to try two communal tabs before he could find one that was not broken, approximately 150 m away from his home. When Julius leaves the small shack of roughly 6 sqm built out of corrugated iron, cardboard, wood and plastic panels, his stomach is still rumbling, because for breakfast he only had a handful of millie-pap (maize mash) that was left from yesterday's meal.

In the darkness of the morning in the Hex River Valley of South Africa he slowly walks through the narrow alleys between the shacks and the dusty streets of the informal settlement in the town of DeDoorns East towards the central square, greeting other people living here in the informal settlement, who share the same morning rituals as him, just like thousands of others. Julius works as a seasonal farm worker during the grape harvest season from April to November on one of the big table grape farms of commercial irrigation farmers of European descent. Julius and his 15 co-workers jump on the back of a truck of the farm owner's fore-workers that comes every morning to drive them to the 120-hectare farm. During the drive they also pass the large farm estate of the white owner not far away from the Hex Valley golf course.

Julius works as a 'picker' and his job is to separate the ripened grapes from the vineyards and to arrange them neatly into a box making sure to cut the small branches bearing the fruits into similar sizes. The more he cuts the more he earns - up to 200 South African Rand per month,

approximately 20 AUD. But “they must also look good”, he says, otherwise the farmer might pay less than the minimum wage, although this “is not legal; it is not right, but if I complain, I will be chased away”. Standing in a half-crouched, half-hunched position under the vineyard, there is only little shade from the South African sun, which heats up the orchards and produces summer temperatures of 35 to 40 degrees during the peak hours of the day. The general minimum wage is R 105 per day for farm workers, in times when a litre of milk in the local supermarket costs 18 to 22 Rand and a loaf of toasted white bread costs around 15 Rand.

After arriving on the farm, Julius and his colleagues, who are mostly migrant workers from South Africa, Zimbabwe, and Nigeria, start working at around 06:00 in the morning. After working for 3 hours, they have a 15 min break and then work another 3 hours until 12:00 or 12:30. They are allowed a break of one hour to have lunch, which is rarely provided by the farmer on whose private land they are working. Water is provided by the farmers from the tap on rare occasions, but in most instances water is given to the workers from the on-farm irrigation dams - water that does not comply with South African drinking water regulations and sometimes gives the men stomach problems. However, from around 13:30 the (white) supervisor of the farm appears and starts shouting at the group of pickers to go back to work. They work for another three hours until around 16:30, have 15 minutes of break and then again start working for another four hours during the peak of the harvest season. This job is the only chance for Julius to earn some money to provide food for his family. “I am not doing the crimes” he says, “I am an honourable man”. Although the work is “hard and very tiring”, he depends on it, because of his children, he says. “And I don’t have transport to look for other opportunities in Worcester or what, and I can’t afford the taxies.” When the harvest is over, there will be no jobs available and he and his wife have to make ends meet for the following 5 months. They are fortunate to also have Rosalyn’s income from her work in the local retail shop. “We used to have a little garden in the backyard here; it helped us with the food. But I don’t have time for it now, you see. And the people they would steal it when we are working on the farms, because they are hungry”.

At 21:00, after almost 15 hours of physical work, Julius and his co-workers are transported on the back to the centre square in the settlements of DeDoorns East, where other farm labourers from the farms in the Hex Valley are ‘unloaded’ as well. Thousands of them arrive here at the same time, during the peak time of the grape harvest season. Exhausted Julius walks through the streets of the settlement in the darkness of the night, trying to avoid the sewage that has spilled into the streets from a nearby overflowing chemical toilet. Hoping that his wife was able to organise some meat on the plate during the day, he quickly washes himself on a local communal tap after waiting in a line for around 10 minutes. The queue is long today, because the other taps nearby his warped house are broken. They protested about the wages for farm work, water supply and better service deliveries last year, but it has not made much difference, he says. He has no idea where the water comes from that he washes with and that he also uses for drinking and cooking, except a vague idea that the “it comes from the municipality”. He has never heard about a Water User Association or the National Water Act.

It is past 21:00 when Julius returns to his home. His children are already sleeping and his wife is not at home. He warms up some millie-pap with some gravy sauce and a few pieces of carrot, before he falls into bed at 22:00. His alarm clock will wake him again at 04:30 in the night.

APPENDIX 2: CONTEXTUAL OVERVIEW TABLES SUMMARIZING LIVELIHOOD FACTORS OF EMERGING FARMERS IN THE HEX RIVER VALLEY

Agential resources and capabilities (RnCs)	Combined empirical findings: Agential RnCs in the context of emerging farmers’ livelihoods in the Hex River Valley	Individual participant statements (Interviews were conducted in April, September, and December 2014)
Human	<ul style="list-style-type: none"> Participants described their well-being and livelihoods as “okay”. All participants were in between 25 and 45 years and described themselves as relatively healthy except some minor issues. However, EF 1, 2, 3 and 4 were constantly afraid of getting sick. This would mean losing part of their salaries, resulted in “empty bellies” and thus posed a great threat to their and their family’s well-being health and livelihoods. None of the participants could afford a health insurance. A constant ‘worry’ about health, employment and the economic fragility of their small farming enterprises was expressed by all interviewed emerging farmers. Access to hospital and or ambulance services was described as very expensive. However, due to possessing a car, they could physically reach the hospital in the next town of Worcester 30 Km away from DeDoorns. Petrol costs and spare parts, however, provided a constant financial challenge. The participants explained not to possess the necessary financial resources to buy medicine in case of an illness. The money to pay for regular medical services was not available and only in cases of emergency or a severe illness they would pay for a visit to the doctor or the hospital. EFs 1 and 2 had a formal education of grade 5 of primary education. EF 3 and 4 stayed in school until grade 4. EF 5 had 10 years of managerial experience in the meat industry. He was also holding two University degrees in agricultural management and business. He was able to create a profitable small-scale farming business in the last 8 years. All of the participants (except EF 5) had only limited to no knowledge about hydrological characteristics and no knowledge about the general water availability in the Hex River Valley. For example, none of the participants knew how much water was theoretically available from the three storage dams. In the process of obtaining a license for the Osplaas dam, the HVWUA proposed to allocate 200 000cbm to emerging farmers. This was unknown to all participants. None of the participants were aware of historical water entitlements (ELU) or subsequent over-allocations to commercial farmers. 	<ul style="list-style-type: none"> “It’s [life] tough, but we are doing okay” (EF 3). “I’m worried about my health; sometimes I can’t sleep at night and think about it for too much” (EF 4). “If I get sick, I just have to push it through [to continue working] (EF 3). “We don’t have enough knowledge” (EF 2). “Without the information, people will just lie to you” (EF 5). “Is it right to say, you need the right capacities to actively participate and even be represented. It is difficult if you do not understand the mechanics” (EF 5).

	<ul style="list-style-type: none"> • Participants 4 and 5 knew that the NWA 1998 was currently the major piece of legislation regarding water, the others had heard about it. The NWRS 2 and the NWPR 2013 were not known to them. Participants 1 - 4 had no knowledge about the formal procedures required for establishment and operation of the WUA. As such, none of the participants possessed knowledge about the political vision behind WUAs as a mechanism of transforming access to water for productive purposes for the black population. • The little knowledge they (EF 1 - 4) possessed was obtained by asking the commercial farmers. • The Breede-Overberg CMA was known to all participants, although their role and responsibilities within the local context of water governance was not clear to them. How CMA and WUA would collaborate was unknown to all participants. • Participants EF 1-4 had no knowledge about current or future policies, plans or strategies of water management in the area. EF 5 was very knowledgeable about the water policy and legislation. 	
<p>Social</p>	<ul style="list-style-type: none"> • Participants EF 1-4 were black. Participant EF 5 was coloured. All were born in the Hex Valley or the neighbouring Valley and grew up living and working on the farms of the large-scale commercial farmers. • The relationship among black emerging farmers in the Hex River Valley was described by the participants as "divided" (EF 4), " "very low" (EF 1) and "corrupt (EF 4)". • Collaboration amongst EFs was limited and the degree of organisation around water related issues was evidently low. Participants perceived their relationship as a competition for the same water resources. • The country wide National Farmers Union (NAFU) was described as not fighting for black farmers, but for themselves and the white commercial farmers, which would bribe the officials. The African Farmers Association of South Africa (AFASA) would be "not organised enough", said small-scale farmer from neighbouring sub-catchment in the Breede Valley in 2014. The EFs from the Hex Valley were not part of any Union, because they were perceived as not being helpful. • Collaboration between EFs and CFs in water related matters was not existent. A practice of sharing information of those who had it (the commercial farmers) and those that were in need of it (the emerging farmers and poor people living in the settlements) was not present. • The emerging farmers had to pay the commercial farmers for borrowing their tools and equipment (which they had maintained themselves in the WUA workshop) in order to develop their fields and keep the farming business going. However, the emerging farmers expressed that commercial would not let them use their equipment regularly and that they had to pay for it. "If they say no, that's the end of the 	<ul style="list-style-type: none"> • "No, we are not organised yet" (EF 5). • "I think we must get organised, but you normally you do not have time for that" (EF 1). • "We are not organised enough" (EF 3). • "No, there is no collaboration here" (EF 2) • "They [the Unions] cannot help us anyway. It is the farmers that manage the water." (EF 4) • "I think they farm by the grace of the white guys. Otherwise they wouldn't be here (Local bank manager, ABISA bank, 2014).

	<p>story. If they don't help us, we have no other option. They know that" (EF 2).</p>	
<p>Economic/ Financial</p>	<ul style="list-style-type: none"> • None of the interviewed emerging farmers faced any immediate risk of unemployment. EFs 1 - 5 were in effect part-time, small-scale farmers. During the day they worked for the WUA. This comprised maintenance of parts of the irrigation system in the Hex Valley, work in the mechanical workshop of the HVWUA maintaining the agricultural machines and other mechanical equipment of the commercial farmers, as well as controlling cultivation related processes on the fields of the large-scale commercial farmers. During their working hours for the WUA, their wives and other befriended men and women, but mostly women attended their small fields. After their daily work, EFs attended their fields during the last hours of daylight. • EF 1 lived with his wife and two children in a small house next to their fields. He was the only participant able to pay the school fees for his one child of school age. • EF 1 and 2 together owned 12 hectares in the Hex Valley (next to the WUA offices). Only 1.5 hectares were planted, because of a lack of water to irrigate the other 10.5 hectares. They received a financial grant of R 9 000 to from the HVWUA buy the Land from the owner, the Dept. of Land Affairs, which also subsidized the purchase with a grant. However, the emerging farmers had no knowledge about purchasing of land without the typical water allocations per hectare in form of an historical entitlement on the property deed. The official documents were stored in the HVWUA archives; the CEO of the WUA had "done the paperwork for us [EFs 1, 2]". • Participants EF 1-2 explained to have a monthly income of around R 2 000 - 3 000 (approximately 200 - 300 AUD) for food , household related purchases and their small-scale farming business. The other 	<ul style="list-style-type: none"> • "So we are farmers on our own, as well as working for the commercial farmers on their farms" (EF 4). • "I have to have another job to be able to finance the farming (EF 1). • "We are hardly breaking even. Sometimes a little profit for us and to pay my workers" (EF 3). • "The knowledge and access to resources makes the difference [between commercial and emerging farmers]" (EF 3). • "The problem is access to finance. We are struggling (EF 1). • "We could try the banks, but we are high risk clients, they call us that. You can't just go and ask for money, we don't get" (EF 1).

	<p>participants were not willing to disclose such information.</p> <ul style="list-style-type: none"> • To start their small-scale farming project all of the participants had received a government grant either through different government programs (LRAD and PLAS⁹⁰) or through the Breede Valley Municipality. • Participants EF 1 - 4 had no financial savings or any other material assets besides the house they were living in and the clothes they were wearing. • Participants EF 1- 4 explained that access to finance was a huge problem, but that the largest problem would be a limited access to water and not enough water to irrigate their table grape fields in an economically profitable way. • EF 5 was actually an emerging farmer that since 1994 made his way into the commercial farming sector. He had been a school teacher for many years until he entered the farming sector in 1996. 	
<p>Physical</p>	<ul style="list-style-type: none"> • EF 1, 3 and 4 lived in small brick houses on their privately owned farmland. EF 2 lived in the poor settlement in DeDoorns East. • Participants 1 and 2 shared the costs for a 15 year old pickup, which they both used together for private and farming purposes. A similar arrangement existed between participants EF 3 and 4. EFs 5 owned a vehicle for private and farming purposes. A tractor had been given to them EFs 1 and 2 by the Dept. for Agriculture as part of the financial subsidies. It had however been bought second hand, and was not 	<ul style="list-style-type: none"> • “The problem is access to finance. We are struggling. The equipment itself is a problem, because we don’t have all the equipment we need to farm. Maintenance is also a problem” (EF 1).

⁹⁰ The LRAD program was a ‘political joint-venture’ between the Department for Land Reform and Rural Development and the Department of Agriculture. It stands for ‘Land Redistribution for Agricultural Development’. It was intended to assist poor black farmers with an initial financial support of up to R 100 000. This included material assets like tractors and ploughs etc. PLAS is the acronym for ‘Proactive Land Acquisition Strategy. In this ‘pro-poor’ program the government ‘proactively’ purchased land with agricultural potential and leased it to beneficiaries of poor and historically disadvantaged people. The latter is highly contested among EFs as all decisions regarding agricultural management (erecting a new fence or making any other financial investment on the land) needed the approval of the Dept. of Rural Development and Land Reform. This line of decision-making power was installed to ensure government control. But due to limited human and financial resources of the South African government, in practice such control was not exerted and applications to erect a fence for example could take up to a year after an application was handed in by an emerging farmer- or was not answered at all. This significantly inhibited effective farming due to large timely backlogs for making decisions that would need a timely response, such as investments into fertilizer or new vineyards etc. Research participants of emerging farmers (in both study areas) confirmed this. However, the general success rate of EFs which had received government grants in the Western Cape was around 20 - 30% (Senior water resource manager Breede-Gouritz CMA, April 2014, Worcester). Mbisi and Dlamini (2011) and Mochotli (2010), provide further empirical insights into the topical nexus of public agricultural grants, water allocations and emerging farmer’s development in South Africa.

	<p>functional due to missing financial means for the necessary repairs.</p> <ul style="list-style-type: none"> • None of the participants EF 1- 4 had a computer or a smartphone. They had no opportunity to access the internet. EF 5 had all of these resources. • Flood irrigation and large-scale sprinklers were used as irrigation methods by EFs 1-5. This technique is more water intensive due to higher evaporation rates and surface runoff than drip irrigation used by most of the commercial farmers. • EFs 1-4 were receiving water from the HVWUA, but they were not aware of how much they were using. Metered connections did not exist. The CEO of the HVWUA would tell them after they had used 50 % of the water and would notify them shortly before he would stop the supply. • EFs 1-4 explained that the CFs would tell them that they would be subsidized by the WUA in terms of payment for their water allocations. My findings however reveal that emerging farmers paid the same R 0.86 cent per cubic meter of water from the Sandrift scheme as the commercial farmers. 	<ul style="list-style-type: none"> • “At the moment we face a threat, ja, the equipment is too old” (EF 2). • “They say they [the commercial farmers of the WUA] subsidise us, so we don’t pay the full price for water. But I don’t know how this works” (EF 4). • “We have a rule, when the dam overflows, the black guys get the water” (CEO of HVWUA, April 2014).
<p>Political</p>	<ul style="list-style-type: none"> • None of the participants had personal contacts into the DWS, the CMA or the local and Breede Valley Municipality. • Participants EFs 1-4 were not participating in the meetings of the decision-making Board (supposedly the WUA MANCO). They also had never elected anyone to represent their interests on the MANCO. • All of the research participants combined had - on paper of the HVWUA constitution - two votes on the MANCO according to their hectares owned (one vote per 5 h). They had, however, never participated in any of the MANCO meetings. EFs 1-4 were legally entitled to be MANCO members. In practice, they attended 2 meetings in the year 2014 and 2015, which were the annual general meetings. • EFs 1-4 expressed their frustration about not being involved and their voice not getting heard. • The vice president of the HVWUA explained he would be the elected representative of all emerging farmers in the Hex. However, the supposedly elected representative for all the emerging farmers had not spoken to participants EFs 1- 4 about any matter regarding water access that was discussed between him and the WUA management in the last two years. • The vice-president in effect owned shares in all of the emerging farmer’s enterprises and was protecting his own business interests. But he was not representing the emerging farmers on MANCO meetings: “I am their boss you could say” (September 2014, DeDoorns). The vice-president of the WUA and had been paid by the CEO to speak to me in a research interview. • As confirmed by commercial farmers and emerging farmers alike, voting never took place during those 	<ul style="list-style-type: none"> • “I am not sitting on the MANCO, because it won’t be right to be my boss and my worker” (EF 3). • “He [the supposedly elected representative of EFs on MANCO] does not speak to us, no.” (EF 2) • “What I have seen in more than one instance was that the drivers of the process, which are the big commercial guys of the WUA, will manipulate the nomination process nominating someone that does not represent a certain constituency or does not exist at all” (Small-scale commercial farmer, 2014 Wolseley). • “No, you can’t involve everybody. The CEO and the president we are an informal management committee [of

	<p>meetings. An informal day-to-day management committee existed consisting of the CEO, the President and the supposedly representative of emerging farmers. They discussed water related issues in the Hex and made the decisions.</p>	<p>the WUA]” (Vice president of HVWUA).</p>
<p>Natural</p>	<ul style="list-style-type: none"> • Participants EF 1 and 2 owned 1.5 hectares of land. The remainder of 10.5 hectares under their care, was owned by the Dept. Land Reform and Rural Development and was leased to them, although they had terminated the lease due to a lack of water. EFs 3 and 4 received land to farm on through governmental programs, but the ownership of the property lay with the Dept. of Land Reform and Rural Development. • Drinking water was supplied to all participants by the municipality. Only EFs 1 and 2 possessed a private borehole, which they would however use as last option due to the high electricity costs for pumping the water out of the ground. They also expressed that their borehole was running dry and the water would be increasingly salty. They suspected a sinking ground water table to be the reason. • All participants (except EF 5) received water for productive purposes through the HVWUA distributed via the underground pipeline system of the Sandrift irrigation scheme. • Water allocations of participants EF 1, 2, 3 and 4 came from the HVWUA. However, EF 1 and 2 were not receiving 7 500 cbm/a per hectare, but instead, they were given 11 000 cbm per year. They had no knowledge about any water allocations per hectare in form of a legal entitlement on the property deed or the previous owner. • All participants accessed water through the commercial farmers. They had to wait until they were told by the CEO of the HVWUA that water would be available. EFs 1-4 had neither active influence on the timely supply, nor on the quantities supplied. • All participants described a lack of water as the greatest threat to their livelihoods, and thus, those of their families. 	<ul style="list-style-type: none"> • “If we come to a serious drought, I think that would kill us [i.e. the farming enterprise]” (EF 1). • “We want to expand [farming activities in terms of hectares] but we can’t. We do not have the water” (EF 1 and 2). • “The water is not enough” (EF 3 and 4). • “That is the thing; we have to wait for them to tell us there is enough water” (EF DeDoorns 2015). • “We can’t go with less. They [the CFs] can, because they have more resources”(EF 3). • “But they [the CFs] make use of their control over water and they can expand [their agribusinesses in terms of hectares under irrigation] whenever they want. It is frustrating, we are not getting anywhere” (EF 4).

APPENDIX 2.1: ANALYTIC NARRATIVE II - A DAY IN THE LIFE OF AN EMERGING FARMER

Andries gets up at around 05:00 in the morning. His wife, Thembile, is already up preparing a strong instant coffee. His children are already running around the house, which has one small bedroom for the married couple and another smaller room for the two children. A broken door in the kitchen wall leads into a separate bathroom with a shower and a flush toilet. The children are too young to go to school and when Andries and Thembile have left the house to go to work, Thembile's sister will attend the children until the parents return. Thembile works in a local shop that sells clothes mainly from China and India to local customers. She earns 220 Rand a day, around 20 AUD. Before having this job, she has worked on the fields of commercial farmers and the subsequent, on-farm packaging workshops for 10 years. Thembile is 26 years old and Andries is 33 of age.

Andries works on the fields of commercial farmers during the day. He has worked for the white irrigation farmers all his life in various jobs on the farm, as did his father before him. Andries was born during the racist Apartheid regime in South Africa of 1983 and grew up on a table grape farm of a commercial farmer of European descent until his family got illegally evicted from their small house on the farm in 2003. They were forced to move into an informal dwelling made up of cardboard and corrugated iron in DeDoorns East, a poor settlement in the Hex River Valley in the Western Cape of South Africa. However, his father passed away and Andries lives now with his wife and two children in a house made of solid bricks overlooking his own piece of land. "During Apartheid it was forbidden by law for a black or coloured man to own any land", he says, "at least now I can try to farm here. But I don't have enough water".

However, Andries and his lifelong friend Alex are also so called emerging farmers, black upcoming farmers historically disadvantaged in the racial agrarian system of the Apartheid. Both have reached grade 4 in school, while working on the farms their whole life. Through this they both have gained considerable knowledge about the practical side of table grape farming including the development of new hectares, planting the vineyards, applying the right amount of fertilizers and water at the right time during the grape growth etc. With a loan from the local Water User Association, they have purchased 12 hectares of land and now try to farm wine grapes. However, they do not have enough water for 12 hectares and they can only irrigate 1.5 hectares.

That is the major reason that their farming enterprise is not profitable yet. They are "dependent on government grants", as financial means from a private bank for an emerging farmer is not easily accessible, because they are rated as high-risk clients. But the "most important thing about farming, is water". Although from the local Water User Association they receive 11 000 cubic metres of water for 0.86 South African Rand per cubic meter, this is not enough to farm profitably and make a little plus at the end of the harvest season. For a profitable agricultural output per hectare of table grapes farmers in the Hex Valley farmers use around 7 500 - 9 000 cubic metres of water. "We struggle with the water, it is not enough. We can only farm 1.5 hectares. It is not enough water", Alex says. Whether their farm has a water entitlement per hectare both had no knowledge about. "They did all the paper work and admin", Andries says and adds: "The other thing is equipment; it is old and we do not have the money for spares. We need a new tractor and some ploughing equipment, but we can't afford it. We have applied for a government grant, but we are waiting for more than a year now". He furthermore points out

many times during our research interviews that they would be frustrated, because of a lack of water. "Sometimes I get very irritated; because I see this [the farming enterprise] is not getting anywhere. There is very little progress, it's a standstill. The others [the commercial farmers] they always have enough water so that they can even expand [their farming business] every year. I mean they helped us, but we work and work, but you can't go further; for that we need more water."

Andries also works for the local Water User Association, which controls access and distribution of 11 million cbm of irrigation water in the Hex Valley. Here, he also works for the same people that he has worked for his whole life, the commercial farmers. Maintaining their farming equipment he earns around 3 000 - 4 000 Rand per month for his family and his small-scale farming business.

Of the 5 200 hectares of arable land in the Hex Valley, 38 hectares are farmed on by black upcoming farmers, the rest is owned by 70 (exclusively) white owners, which is roughly the same ratio as it was during the Apartheid. Farm sizes vary from 30 to 300 hectares. As water from the two major storage dams are fully allocated per hectare of irrigated land, for upcoming farmers buying land that has an allocated amount of water is the only way of accessing water for productive purposes. With water tied to the land one hectare in the Hex Valley can cost up to 300 000 South African Rand (around 27 000 AUD). Government grants are available, but Andries says that "it can take up to two years for you to get one". Financing the drilling a borehole themselves, whilst also paying the electricity costs for pumping the water out of the ground once the well is established, they don't have enough money. To construct an on-farm dam for storing water Alex and Andries also lack the money. "We could try the banks, but it's not easy for us, they say we are high risk clients" Andries says. He adds that he thinks the upcoming small-scale farmers should pool their resources and establish an organised forum as self-help system, "because the big guys they are very organised, I think that helps them with their water and their farms." While he is speaking, the Water User Association holds a meeting among commercial farmers from the neighbouring Irrigation Boards and he says: "Maybe things will change when we can become part of the management committee of the WUA, so far, we are not invited. They [the commercial farmers] will tell us what is happening and when we will get the water".

However, when Andries and Alex have called it a day at around 17:00, they both go to check their own fields in the last one or two hours of daylight. During their absence their fields have been taken care of by seasonal farm workers, men and women, which they employ from the poor settlements in DeDoorns East and Stofland. However, mostly Andries and Alex have only time on the weekend to attend their fields, which also makes it difficult to farm sustainably for profit. When Andries goes to bed "it is at least in my own house", he states. Alex however goes back to the informal settlement of Stofland where he shares an RDP house with two rooms of each 15 square meters (built by the government for people without proper housing) with another 4 people. "You have to stay positive", he says, "one day we will get the water".

APPENDIX 3: CONTEXTUAL OVERVIEW TABLE SUMMARIZING LIVELIHOOD FACTORS OF COMMERCIAL FARMERS IN THE HEX RIVER VALLEY

Agential resources and capabilities	Combined empirical findings - Resources and capabilities in the context of commercial farmers' livelihoods in the Hex River Valley	Individual participant statements (Interviews were conducted in April, September and December 2014)
Human	<ul style="list-style-type: none"> • Their well-being and livelihoods was described as generally 'fine', 'good' or 'excellent'. All participants were very well nourished. None of the interviewed farmers had any complaints about their health situation, except for CF 1, who weighed around 130 Kg and had heart problems. • Access to hospital and or ambulance services was described as no challenge to any of the participants. All participants had a private health insurance, as did all the members of their extended families. • All participants had University degrees in a study field related either to agriculture or in the field of business and administration. All were fluent in the Afrikaans and English language. • All of the participants had extensive knowledge about water availability in the catchment and even the larger Breede River catchment. For example, all participants knew the amount mean annual precipitation, storage capacities of the Lakenvallei and Roode-Elsberg dams and the storage capacity of the recently built Osplaas dam. • They furthermore knew the water requirements of their different grape varieties and how much water they were entitled to from Schedule 4 water licenses (Existing Lawful Use) as well as from newly acquired licenses. They were however not willing to disclose this information. • All participants knew the NWA 1998, the NWRS 2 and the NWPR 2013 and had a hard copy of at least the NWA 1998 in their office. • All participants had knowledge about the WUA, the CMA's, the Catchment Management Strategy (CMS). • All participants thus had significant knowledge about current or future policies, plans or strategies of water management in the area, about water governance related legislation and the institutional architecture of DWS, CMAs, and WUAs and Irrigation Boards. • All participants except CF C were members of the WUA; one was the President of the Hex Valley WUA. 	<ul style="list-style-type: none"> • "I can make a good life here" (CF C). • "Life is good, no problems" (CF D). • "We create the jobs for these people [the poor] here" (CF 1) • "Without irrigation there would be no jobs in the Hex Valley" (Senior manager CMA 2015) • "I was at University and my kids will go to University" (CF 1).

<p>Social</p>	<ul style="list-style-type: none"> • All participants were white males of European descent. Members of the exclusively white farming community in the Hex Valley often shared the same surname and were in some instances (CF 2 and 5) related. • All participants were members of the Hex Valley Table Grape Farmers Association and the regional agricultural lobby association⁹¹ 'AgriWestern Cape', which is a branch of the national agricultural lobby organization 'AgriSA'. • Participants 2, 3 and 4 were part of the Christian community and met regularly during church functions on the weekend. • CFs 3 and 4 were also members of the local wine cellar organisation. • Except CF 5, all respondents were members of one of the five sub-district of the 'Hex Valley WUA', although all participants of this study who knew about the WUA, had without exception, referred to the sub-districts as 'Irrigation Boards' and to the Hex Valley WUA as 'the Board'. • All of the participants' extended families of their sons and daughters were living in their own house on the same property that encompassed the grape farming fields, stalls and the farmhouses. • Excellent contacts to ex- officials from the Department of Water Affairs and the influential SAAFWUA (South African Association for Water User Associations) were described as existent by all participants. CF E had relatives in official positions in the DWS during the Apartheid and during the times of government transition in between 1994-1996. • The senior water resources manager, the chief water control officer and the water use officer from the CMA's senior management were known to all commercial farmers by name. The relationship between the commercial farmers organised in the HVWUA and the senior staff of the CMA was described with the words of "reliable", "good", "he is answerable" and "we work well together". All participants confirmed "very good contacts" (CF C and D) to especially the chief water control officer and the senior water resources manager. During interviews 	<ul style="list-style-type: none"> • "Yes, they know each other well. They have been doing this for many many years" [being organised in a form water organisation] (Senior manager Breede-Gouritz CMA). • "It's always the same guys that you find on the important committees here" (CF 3) • "The farmers are very loyal to each other" (Muni 2015). • "They [the farmers] are very organised" (CMA senior management 2015). • The [CMA chief water control officer] is very answerable; he picks up the phone when you call him. He is very helpful. The DWS you can phone for months and nobody will pick up the phone" (CEO of the HVWUA).
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⁹¹ The primary goal of Agri Western Cape is to: "ensure that an agri-friendly policy exists" (Agri Western Cape website, <http://www.growinggreatness.co.za/>, accessed: January 2017).

	<p>with the CMA both confirmed this.</p>	
	<ul style="list-style-type: none"> • None of the participants faced any risk of unemployment or had ever been unemployed. • The daily work of the interviewed commercial farmer comprised rather administrative and supervisory activities; none of the commercial farmers interviewed for this study was actively involved in the practical work on the fields. Overseeing actual farm work for example picking the grapes from the vineyards and sorting them into boxes was done by white foremen, whereas the actual work was carried out by farm workers from the settlements. • CF 5 had an income of 16 million Rand in 2014, participant. CF 1 earned 5 million Rand and CF 3 had an annual income of 3 million Rand. The others did not disclose this information. • None of the participants had a financial bond on their privately owned land. One hectare of developed arable farm land in the Hex Valley (with the historical allocation of 7 500 cbm/a) is worth approximately R 300 000 (CF 5; CEO SAAFWUA 2015). • All participants explained that access to finance was not a problem, neither private, nor for the farming enterprise. CFs A - D never had to take up any a loan or credit for agricultural purposes from a private bank. • All of the participants had considerable private savings and other assets. None of them wanted to disclose the actual amount. • All of the participants had sufficient agricultural equipment, such as tractors, ploughs and irrigation 	<ul style="list-style-type: none"> • “I can’t complain; I do what I want to do, I’m a grape farmer” (CF 1). • “Access to finance is not a problem” (CF 1, 2). • “I have good connections to Landbank⁹². Private banks will also give me money, I have enough assets. But I have managed without these sharks all those years” (CF 2). • “I can send all my kids to University, no problem” (CF C). • “I have another house in Cape Town” (CF 4). • “I fetch them [the farm workers]

⁹² Land Bank is an agricultural bank and is, in principle, guided by a government mandate. They provide financial services to the commercial farming sector and to agri-business. They are politically tasked with making available “new, appropriately designed financial products that would facilitate access to finance by new entrants to agriculture from historically disadvantaged backgrounds” (Landbank website; accessed: December 2016). However, questioning this, I found that access to means of finance by the historically disadvantaged people (living in the settlements) and the emerging farmers alike was described as the second biggest challenge apart from not having access to water by emerging farmers (Consultancy 2015;; EFs 1-4). Access to credit was described as “almost impossible”, due to a lack of assets offered as collateral to the bank (ibid.).

<p>Economic/ Financial</p>	<p>infrastructure. Private transport was not a challenge for any of the participants; all participants owned two cars and CF 5 owned four vehicles.</p> <ul style="list-style-type: none"> • All interviewed commercial farmers lived on large farm estates in large buildings, which were mostly fenced off with barbed wire from the outside. All of them employed domestic workers, such as cleaning ladies and kitchen personal, which were living the settlements. • Earnings in all cases covered living costs and those of their 1-4 children. All participants without exception were able to afford tertiary education for their children. • CF 5 owned properties in Cape Town that he rented out. He also owned a private town house in Cape Town, besides his large estate in the Hex Valley. CF 2 owned additional farms near the Orange River in South Africa. • The vice president of the HVWUA owned shares in the EFs farming projects, shares in local transport company, shares in a local wine cellar and he earned money from various consulting jobs for example for the Department of Agriculture, Forestry and Fishery. • All participants had the financial means to pay bribes to DWS officials in the unlikely case of a detected over-abstraction. Three commercial farmers freely admitted to use bribes frequently, the others did not negate this. 	<p>there [at a central place in the settlements] and I bring them back after they've finished" (CF 2).</p>
<p>Physical</p>	<ul style="list-style-type: none"> • All participants lived in privately owned farmhouses on their farm estates. • Sufficient farming equipment and production facilities were privately owned by each participant. This included on-farm packing machinery and facilities, tractors, ploughs and electronic irrigation system surveillance. • Access to latest technology was evident. Personal computers and smartphone with internet connection, as well as a telephone landline were standard communication devices for all participants. All participants except CF 5 used electronic devices to remotely control soil moisture and the amount of water irrigated either through a drip irrigation or micro-jet irrigation system. • Irrigation infrastructure of pipelines, boreholes and on-farm dams were owned by all participants on their private property. Maintenance on the irrigation system and ensuring a good condition of the irrigation infrastructure were the most frequent encountered challenges, but the infrastructure was described as to be in "good condition". This correlates with my own observations. • The distribution infrastructure for water from the Sandrift scheme was collectively owned by the commercial farmers organised on the MANCO of the HVWUA. Their ownership ended where the private property and related infrastructure (either canals or underground pipes) of each farmer began. • All participants had a car (pickup type) not older than 10 years and one or more cars for private use. CF 5 also made use of a private driver as he was obese and had heart problems. 	<ul style="list-style-type: none"> • "Household water comes from my boreholes, it's good quality" (CF 2). • "I use Iricheck on my phone to check the soil moisture and then I do the drip irrigation as well [on the phone]" (CF 5). • "We bought it [the Sandrift irrigation scheme] from them [the DWS]" (CEO HVWUA). • "You have to have the packaging on-farm, because going outside eats your profits" (CF 2).

<p>Political</p>	<ul style="list-style-type: none"> • The vice-president of the WUA was an “advisor” to the Minister of Agriculture, Forestry and Fisheries and regularly participated in meetings with ministerial staff in order to “raise our issues to him, so that he knows and can act accordingly”. The CMAs senior manager confirmed this. • All commercial farmers were organised in their ‘sub-districts’ and were represented on the WUA MANCO and towards other government bodies such as the CMA and the DWS. • All participants confirmed they would have good contacts to the municipality. The CEO of the HVWUA in 2014 explained that the municipality would contact him frequently to discuss issues around planning and development of municipal water supply and sanitation and also “to ask for more water for these people [living in the settlements]”. • All interviewed commercial farmers were members of one of the ‘sub-districts’ of the HVWUA. They participated regularly either in meetings of their sub-district (which all participants called Irrigation Boards) with the CEO, the President and another representative of the WUA. 	<ul style="list-style-type: none"> • “He [the CEO of the WUA] is the secretary [of the Irrigation Boards], he provides administrative support to us” (CF 3). He is doing all the admin, but he also opens the weirs and sluices.” • “No, we never vote” (CF 5). • “You have more bargaining power towards the DWS, that was the only reason to go for the WUA route, nothing else” (CEO HVWUA).
<p>Natural</p>	<ul style="list-style-type: none"> • Private farmland in the Hex Valley (with 7 500 cbm of water allocated per hectare annually) was possessed by all participants. The farm size varied from 50 hectares (CF 3) to over 500 (CF 5). • All participants received water for productive purposes from the HVWUA through the underground pipeline system. Besides that all (except CF 5) participants had three to seven boreholes. Drilling additional boreholes was described as “no problem”. • Drinking water supply for commercial farmer CF 1 and CF 2 came from their private boreholes, which they utilised for all household purposes. Participants 3 and 4 received water from the municipality to in-house tap connections in their farm estates. CF 5 lived permanently in his house in Cape Town. Flush toilets in every bathroom were standard for all participants. • Access to water for multiple purposes from multiple sources was evident. All participants had access to at least three sources of water. They had a connection to the municipal water supply system mostly for drinking and sanitation purposes. They owned private boreholes for ground water abstraction and the participants stored mountain runoff from precipitation in private on-farm dams. In additions CF 2 and 4 also possessed rain water harvesting tanks connected to the some of the roofs of farm buildings. • None of the participants had difficulties securing their water used for everyday purposes or for productive agricultural purposes. 	<ul style="list-style-type: none"> • “I own 200 hectares in the Hex” (CF 4). • “We have good quality water here” (CF 2). • “Water access is still ok, but I don’t want to be in this Valley when the next droughts comes” (CF 2). • “It’s ours. They gave it [the water] to us, the farmers when we bought the system from them [the DWS]” (CEO HVWUA 2015)

	<ul style="list-style-type: none">• All participants described access to land as not being a problem. Land resources in the Hex Valley were sold amongst commercial farmers ensuring the land (and therefore the water allocated to this land). Buying land in order to get access to water for productive purposes was common practice among the commercial farmers in the Hex Valley.	
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APPENDIX 3.1: ANALYTIC NARRATIVE III - A DAY IN THE LIFE OF A COMMERCIAL FARMER

Riaan de Jager is a commercial table grape farmer in the Hex River Valley in South Africa. Together with his wife Franzel and his two sons he lives on his large wine estate on the foot of the Matroosberg Mountain in the Hex River Valley in South Africa. His European ancestors arrived in 1740 and settled in the Hex Valley to start grape farming. Today Riaan and his brother Johan own seven farms in the Hex Valley on which the extended family farms four different grape varieties for the export to Middle Eastern, but mainly to European markets of UK, Netherlands and Germany. The whole of the Hex Valley has around 5 200 hectares of arable land, of which 99.3 % are owned as private property by around 70 commercial farmers of European descent

On 130 hectares the de Jagers employ 500 people during the peak of the harvest season in between April and November, of which 30 % work permanently on the farms and 70 % are seasonal workers. The 20 permanent workers and their families live on the de Jagers' farm, but in houses provided by the de Jagers, while they obeying a strict catalogue of behavioural rules. For example, visitors are required to register; music is not allowed and dogs have to be female. However, the seasonal workers are mostly employed as 'pickers', picking the grapes by hand from the vineyards, or as 'carriers' that carry the cartons filled with the freshly picked grapes to the hanger of a tractor that transports the grapes to the on-farm packing facility owned by the de Jagers and overseen by a cousin of Riaan. Pickers and carriers are paid R 10 - 12 South African Rand per hour and foreman or tractors drivers are paid approximately R 40 an hour. The seasonal workers are collected by farm employees with pick-up trucks in the informal settlements in the Hex Valley at around 06:00 in morning. At around 20:00 they are brought back.

Riaan says, he would normally get up at 05:30 in the morning and start his routine of checking the growth of the grapes at strategic points of the farm at around 06:30. He drives around certain areas while checking on his smartphone-app the soil moisture on all of his farms and, if needed, adjusts the dripping ratio of his satellite steered drip-irrigation system. He then goes on to supervise the farm workers, has a look into the packaging facilities, but is often caught up in administrative and management issues and spends rest of the day in his air-conditioned office.

During the harvest, he says, "things get very busy and I am busy with overseeing all the activities. But I have my guys for the work in the field, the black guys that have lived here on the farm their whole life that I can trust. I am managing them." Riaan his brother both have a University degree in agricultural sciences, respectively management. In his office, around the four-meter glass and marble table, six white leather chairs are arranged for business meetings. Besides his and his brother's degree certificates of agricultural sciences from Stellenbosch University and pictures from his children, which now go to the same University, the walls are decorated with stuffed animal heads of South African deer, Impalas and Kudus, his hunting trophies. His secretary brings in the second Italian espresso coffee, while he goes through his accounts and water bills to provide me with information on crop yields and water requirements. Last year Riaan has harvested more than 230 000 cartons (each 4.5 Kg) of table grapes for European markets, earning around 16 million Rand, while also having a share in one of the transport companies that transports the grapes to Cape Town harbour and he also holds shares in the local wine cellar. "I can make a good living here, not as good as in my house in Cape Town,

but I go there on the weekends” he says. Within the last 5 years Riaan and his brother bought another 110 hectares in the Hex Valley. “We bought 40 and then another 70 from another farmer. But the good thing is, the 70 hectares has an allocation of 100 hectares of water. So we borrowed some money from Landbank and bought it”. Two major storage dams in the Matroosberg Mountains that were built in the 1970s store precipitation water, with rainfall occurring only during the winter months of June, July, and August. This water is fully allocated per hectare of irrigated land - 7 500 cbm of water per hectare.

Besides 86 000 cbm of surface water from the irrigation scheme that the local Water User Association supplies him at the cost of 0.86 South African Rand per cbm (0.07 AUD), the de Jager’s also make use of groundwater from 7 boreholes on their property. In addition, they also catch some of the mountain runoff in a large on-farm dam of 100 000 cbm. His water abstractions under the Schedule 4 water license are Existing Lawful Use, which are water abstractions which lawfully took place in the two years before the commencement of the new post-Apartheid National Water Act of 1998. Through his contacts into the Department of Water Affairs, where his brother has worked for 25 years, Riaan was aware for this new piece of legislation coming, so he drilled his latest 4 boreholes before the enactment of the new law rendering all his water use Existing Lawful Use as secured allocations. Thus the 600 000 cbm he is pumping out of the ground annually through these boreholes he receives guaranteed by law. Commercial farmers shared this knowledge amongst their loyal members of the farming community in their meetings in their agricultural associations, in church or in the local tavern and therefore “thousands of boreholes were drilled during this time”. He adds that: “in the Hex we are using water that we actually do not have. When I was born in 1948, we used to have boreholes on this farm and they were 30m to 40m. And it was clean water, very pure. Now, we are drilling about 280m down, putting in the pumps at 150 - 180 m and we get brackish water”. Due to the reduction of the outward pressure of the water bearing geological formations under the Hex River Valley, salty water from the geological formations in the North of the Valley intrudes the groundwater in the Hex. Water is abstracted at four times the recharge rate. Moreover, due to market competition from Latin America and the changing preferences of European consumers, 40 % of the Hex Valley irrigators currently switch their production to larger grape varieties, Riaan’s son tells me. He and his brother are currently replanting one third of their farmland with those larger varieties. “But with the bigger varieties you can waive the 7 500 cbm per hectare of water requirements for table grapes of standard varieties goodbye. They use 10 000 cbm per hectare.” But the socioeconomic situation in the Hex “is already a social disaster, there are simply no jobs” besides during the 5 months of grape harvest. But he points out that at the same time the population in the poor settlements is growing rapidly into the forty thousands, thus the demand for water is increasing. But as the senior manager from the local municipality tells me later: “Unfortunately, all the water is tied up in allocations”. What he means is that 95 per cent of the available surface water in the two dams is tied up in fixed allocations per hectare of existing lawful use. Riaan de Jager adds that violent service delivery protest in 2013/2014 made him think about selling the farm here and move to the Orange River, where his family owns another 200 hectares of table grape farms. “I don’t want to be in this valley when the next dry period comes, I have seen it before in 1972, but with way less people.”

APPENDIX 4: CONTEXTUAL OVERVIEW TABLE SUMMARIZING LIVELIHOOD FACTORS OF THE POOR IN THE GROOT MARICO CATCHMENT

Agential resources and capabilities	<p style="text-align: center;">Combined empirical findings:</p> <p style="text-align: center;">Agential resources and capabilities in the context of people’s livelihoods in the rural villages of Koffiekraal, Skuinsdrift, Pella, Brakuil and the rural town of Groot Marico in the Groot Marico catchment</p>	<p style="text-align: center;">Individual participant statements</p> <p style="text-align: center;">(Interviews were conducted in January, June, September, November 2015 and in January and March of 2016.)</p>
<p style="text-align: center;">Human</p>	<ul style="list-style-type: none"> • The well-being and livelihoods of people from the settlements was described as: “not good”; “health is not good”; “life is hard, but we are doing ok”; but also as “we are slowly getting there”. • Their mental well-being and bodily health were generally in a better state than in the settlements of the Hex Valley. A limited food supply was evident in the village of Koffiekraal. Due to the existence of subsistence food gardens growing fresh vegetables such as spinach, beetroot and cabbages, hunger was a main livelihood challenge and food sources were largely limited. • Poor health conditions existed in the rural village of Koffiekraal, due to lack of affordable medication, medical service and long distances to the next hospital. Access to hospital and or ambulance services were described as too expensive in general. • Stomach problems diarrhoea and a general feeling of constant fatigue were prevalent. High mortality rates among all ages were prevalent (see also Nicolau 2013). Funerals, sometimes more than one, happened daily. • However, the tribal leader was also the one responsible for the traditional knowledge with regards to medicine from indigenous plants, so called phyto-pharmaceuticals. He created a medicine from different plants in the broader area, which some of his friends and extended family would drink regularly. Self-help systems in the traditionally organised community were also able to cater for the vulnerable (the sick, hungry and elderly and also infants) to a certain degree. All participants were however worried about how to get food or about not having enough food for their family and were suffering from hunger and malnutrition. • Local ‘tuck-shops’ sold basic cooking ingredients of staple foods and oil, beverages and some little fresh produce from the small-scale farmers (if they had surplus to sell) existed in all in rural villages and in Groot Marico a small supermarket operated. • A constant influx of people from Botswana and Zimbabwe put additional pressure on the existing and already largely limited service delivery of the Ramotshere and the Moses Kotane municipalities. In addition, illegal farm evictions were causing a steady increase of the population of Koffiekraal, Pella, and Skuinsdrift. • All participants had only limited or no formal education, none above Grade 3. All participants had only limited knowledge of the English language. Two participants were able to read English. Reading and understanding legal texts (such as the National Water Act I handed out to them) were described as ‘very difficult’. • None of the participants had knowledge about the NWA 1998, the NWRS 2, the NWPR 2 or any other current or 	<ul style="list-style-type: none"> • “Many here, you know, their health is not good” (Member of the Tribal Council Koffiekraal, Koffiekraal September 2015). • “My people they are sick” (Elder from the Tribal Council, Koffiekraal; March 2011) • “Yes, I am hungry right now, very hungry” (Tribal leader, September 2015, Koffiekraal). • “Life is hard here my brother, very hard” (Tribal leader, September 2015, Koffiekraal). • “Khoshi is not just a leader, he is knowledge storage. The white men have their own system of archiving information, we also have” (Tribal leader of the Hurutse chieftain, September 2015). • “Westernized thinking is property-oriented. For the

	<p>future policies, plans or strategies of water governance in the area. Participants possessed no knowledge about the process of WUA establishment in the Groot Marico area. The tribal leader in Koffiekraal had heard about it, but had no knowledge about its meaning or about the roles, responsibilities and powers a potential WUA would have had regarding water access and control. As such, none of the participants possessed knowledge about the political vision behind WUAs anticipated as a mechanism to transform water access and control specifically for the previously disadvantaged. The existence of an official water licence of Existing Lawful Use (Schedule 4 water entitlement, NWA 1998) was not known to them. How water for productive purposes was governed and allocated, participants had no knowledge about.</p> <ul style="list-style-type: none"> • However, substantial knowledge about the geo-hydrological characteristics of the study area existed in form of traditional narratives. In these traditional stories, the mountains containing the origins of the Marico River (Molopo eye and Malmani eye) were the tears of a lethally wounded giant snake. After fighting with rivalling snake it died and its dead body formed the mountains and the hills of the area and the tears of the snake formed the eyes of the Marico River. Geo-hydrological knowledge was imprinted in these stories and described the landscape in a natural setting before human alterations to it. 	<p>black natives that is an alien concept. Property is a western concept. To write something down on paper and thereby giving it legal authority of being property of someone was something even more alien to their culture” (Former secretary of the WUA establishment committee and head of development project MRDP⁹³, Groot Marico 2015).</p> <ul style="list-style-type: none"> • “ I don’t have the knowledge about these things you see” (Small-scale subsistence farmer in Koffiekraal, November 2015)
<p>Social</p>	<ul style="list-style-type: none"> • All participants from the rural areas in Koffiekraal were born on the land of the Hurutse chieftain in the area north of the Marico Bosveld Dam (MBD) and grew up living and working on the farmland of the large-scale commercial farmers. They all belonged to the Bo-Moghatla Bahurutse of the broader (Se-) Tswana⁹⁴ people. • A traditional committee of Koffiekraal included the surrounding smaller settlements and the members came from 	<ul style="list-style-type: none"> • “We have our own systems here. We are a traditional community” (Tribal leader, Koffiekraal, September

⁹³ The Madikwe Rural Development Project (MRDP) is a funded by the German ‘weltwärts’ [into the world, *my translation*] organisation sending young volunteers into social development programs worldwide. One of them is the MRDP. The rural communities of Koffiekraal and Skuinsdrift are their focus areas. Volunteers teach in the local school and help in the local crèche (childcare) and the orphanage. The Program is led by two social development workers and besides the educational activities it includes a pedal bike assembly funded by an international development organisation. The bikes are sold locally and also in other parts of South Africa to mitigate their localisation due a lack of transport.

⁹⁴ The knowledge presented is all but comprehensive. It presents only a snapshot picture of a traditional, tribal organisation hundreds of years old and transported through time in oral history of stories, poems and other narratives. Tempelhof et al. (2014)offer excellent insights into that the nexus of culture, spiritual orientation and water.

	<p>Pella, Brakuil and Skuinsdrift. The Tribal Council (called Morafe) was a platform of organised decision-making following a system of (unwritten) norms and rules (including sanctions for village member who had committed a crime in village). A rather democratic form of organising was evident with different layers of traditional authority and power.</p> <ul style="list-style-type: none"> • A rich cultural heritage of traditional knowledge of the Setswana people of the Bahurudse tribe created a ‘social glue’ of belonging together. A sense of the importance of water management and the interconnection of agriculture, ecosystem and human health existed. This was woven into the oral history of the participants portrayed them as an integral part of the environment. • Described by participants as “a traditional community”, people were often part of social events mostly open to everybody. Marriages, but also funerals for example were a social event for collectively practiced rituals of singing and dancing or simply sitting together under the shade of a tree discussing livelihood issues. This often resulted in a collectively made decision, according to which a member of the Tribal Council would act. This is also related to issues of water access and sanitation. However, this practice was time intensive and until a decision was reached, weeks could pass by. However, this time was also often needed to obtain some official information, rather than not agreeing. • Employment opportunities were generally rare. In next the towns of Zeerust or Rustenburg employment opportunities are hugely limited and unemployment rates of 80 - 90 % were the normality. • Public transport does not exist in South Africa. Private means of transport such as local taxies came to the villages rarely and were described as not affordable. • Alternative job opportunities outside the well-known paths of farm labour and working in the platinum, dolerite and chrome mines around Rustenburg, or the shale mines near Swartruggens, did not exist. The working conditions in the mines were described as “horrible”, “crazy” and “very dangerous”. • Similar to the poor settlements in the Hex River Valley, farm workers and mineworkers were picked up in the morning by busses and pick-up trucks driven to work and dropped off in the late hours of the evening in or near the village. A typical day was about 9 to 13 hours of work. Labour conditions on the farms were described as “hard”; “very tiring”; “unfair”; “a lot of maltreatment”. For farm workers no labour contracts existed. The labour unions were described as “corrupt” and “useless”. • In most instances family members or friends took care of the children while their parents were at work. A daily childcare was organised privately by people in each of the village and supported by the MRDP. A new local primary school had just been built and roads were under construction. Many of these initiatives were started by a rural development project of the Social Science Department of the University of Johannesburg. • A general lack of water was evident in all rural villages. In Koffiekraal, the water in two large storage tanks filled by the municipality were used for multiple livelihood purposes. Conflicts over water occurred frequently, because those with a small backyard garden were accused by those without of stealing water and using too much of it. 	<p>2015).</p> <ul style="list-style-type: none"> • “We have to obey nature, Not the law. Tribal leader, Koffiekraal, September 2015). • “Working there [in the mines], my friend it is crazy; very dangerous” (Small-scale subsistence farmer Koffiekraal, who grew up working in the mines, November, 2015). • “They are giving us these VIP toilets now. Do they want us to go back to the bucket system?” (Member of Tribal Council, Koffiekraal, March 2011). • “We always get the problems with the water in September, November, and December; so we don’t have when we need it most. They say [the municipality] that it is because of the pumps not reaching the groundwater any more” (Member of Tribal Council, January 2016, Koffiekraal).
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	<p>However, conflict happened mostly in the hot summer months (of September until February). Koffiekraal had seen physical fights over water as well.</p> <ul style="list-style-type: none"> • Illegal farm evictions were the reality. People who had worked for commercial farmers all their life, were, through a law (Extension of Security of Tenure Act 1997, ESTA) entitled to claim (under certain conditions) the small piece of land they had called home for many years while working for the farmer (so called 'labour tenants'). What was anticipated as providing legal security to the on-farm labourers, led the commercial farmers "to chase them away" (CF B, 2015) before they could claim anything. The local police closed their eyes to this. Many participants claimed that the local police chief and other officials were regularly bribed by the commercial farmers. On numerous accounts they named CF A and B as "they are the ones that have many others in their pocket". CF A had been local policemen for 20 years before buying a farm next to Koffiekraal; his wife was still employed by the local police. • Other existing social challenges in and around the rural villages were described by participants with people disappearing, poverty, lack of water, alcohol abuse, sex crimes and mistreatment by commercial farmers. HIV/Aids, a high death rate among all ages and stock theft were also named by participants (see also Nicolau 2013; Tempelhof et al. 2013). 	
<p>Economic/ Financial</p>	<ul style="list-style-type: none"> • Employment opportunities were largely limited. 80 - 90 % unemployment in study area was the normality. For the inhabitants of Koffiekraal, Pella and Brakuil besides low-skilled work as day labourer in local mines or on the fields of commercial irrigation farmers, no other employment opportunities existed. • Traveling to the larger town of Zeerust or Rustenburg to seek work was not an option to participants due to a lack of private means of transport and not having enough money to pay for transport with the local transport (if available at all). Livelihoods were determined by poverty and a lack of economic development. • A daily salary of R 80 - 100 for nine to thirteen hours of physically hard labour on the farms was the norm. In 2013 the daily wage of farm workers was R 69 a day. This was raised to R 105 per day as a countrywide minimum salary. However, similar to the Hex River Valley farm labour characteristics, not all farmers payed this amount. Sometimes they paid only R 50 for ten hours of hard work. No employment contracts existed and accountability by the police was completely absent. • Earning little or no income from small-scale subsistence farming, saving money was not an option. People lived from hand to mouth. None of the participants had any material wealth or financial savings. • Forms of housing ranged from houses built (to different degrees) out of a mix of clay, wood and bricks, over some RDP houses to shacks and huts out of metal plates, plastic and wood or whatever material was available. • Access to finance was described as a huge challenge by participants. Access to loans and credit from private banks was not existent, due to a lack of assets or 'collateral' to offer. • Paying the school fees of a R 100 per month per child and the schooling material was described as a huge challenge. 	<ul style="list-style-type: none"> • "We don't have transport here. They [the local taxies] don't even come here anymore. They say it's not worth it" (Member of Pella village during meeting of the tribal council, January 2015, Koffiekraal).

<p>Physical</p>	<ul style="list-style-type: none"> • The last irrigation channel of the Marico Bosveld Irrigation Scheme ended right before the village of Koffiekraal. The weir and the diversion box that, in principle, could supply irrigation water to Koffiekraal had been destroyed around ten years ago, so that the last off-take was now located at the farm in the irrigation scheme before Koffiekraal, belonging to commercial farmer CF B. • The Marico River was used by the inhabitants of the town of Groot Marico and the rural village of Koffiekraal and Skuinsdrift to augment their water supply for multiple livelihood purposes. For the traditional community of Koffiekraal the river however was of vital importance, especially in times of drought during the hot summer months from September until February). Participants described that water tankers would deliver water unregularly. During this there would be no water for watering crops or animals, and only little for human consumption and sanitation. • The groundwater wells and the mechanical pumps in Koffiekraal used from 2004 to 2009 were closed by the municipality. The village representatives were told that the groundwater would be polluted and not safe for drinking. A reason was not given. However, the hundreds of pit latrines for the village of around 10 000 - 15 000 people, I suspect, might have contributed to the pollution over time. They were emptied unregularly by a private company which transported the sewage to the Zeerust WWTP 40 Kms away from Groot Marico. This was because Groot Marico’s municipal water treatment plant was old and ailing and in a critical condition. The sedimentation tanks were overflowing frequently, both in Groot Marico and Zeerust. The result was a direct discharge of sewage into the Marico River at a large-scale, furthermore resulting in downgrading the ecological status of the once most pristine River in the whole of South Africa to D\F. This describes a water body not fit for human or animal consumption. As such, this threatened the livelihoods of the rural villages and smaller settlements around as they were dependent on the River water for their own consumption, their cattle and their small-scale subsistence gardening. The pollution of the Marico River presented a threat to the livelihoods of the black and poor from the rural communities along the River. • Water for human consumption was supplied to Koffiekraal and also to the villages of Pella and Brakuil by the local municipalities. It was abstracted from groundwater sources near Zeerust and pumped into two large storage tanks and a few smaller tanks. This water was however not sufficient to guarantee a constant supply, because in the hot and dry summer months the pumps did not reach the groundwater table any more. This was due to groundwater abstractions of commercial farmers at a rate which caused the water table to sink below the reach of the pumps. • The increased occurrence of electricity blackouts in the country in the years of 2014, 2015 and also 2016 the tanks were also not supplied with sufficient amounts of water, because the ground water pumps could not be operated. • Sanitation devices were either pit latrines made of corrugated metal and wood or ventilated improved pit latrines (VIP toilets) out of concrete and or corrugated metal. Only very few houses were equipped with a functioning flush toilet. • None of the interviewees possessed any land in terms of private property. However, the tribe of the Bahurutse used their right to claim the land of their ancestors (Restitution and Land Rights Act) back from the commercial farmers 	<ul style="list-style-type: none"> • “Sometimes we don’t have the water” (Tribal leader, January, 2015 Koffiekraal). • “We are fetching the water with that bike here” (Small-scale subsistence farmer in Koffiekraal, September 2015). • “We all got chased away from the farms we were working on our whole life. We did not get paid for the last weeks and we had to leave. They were threatening us” (Small-scale subsistence farmer in Brakuil answering for the whole group of 10 people, January 2015).
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	<p>whose ancestors had appropriated the land during the colonial and Apartheid centuries.</p> <ul style="list-style-type: none"> • None of the research participants had a computer (except the tribal leader), tablet, or smart-phone with internet access. • None of the participants had any private means of transport. Lack of transportation inhibited disposal of agricultural products on local markets; access to official authorities; access to hospitals, supermarkets and thus to food supplies. Walking long distances to the next supermarket (10 - 15 Km) was inevitable in many instances. Mobile food vendors did not exist. A prevalent lack of transportation meant significantly inhibiting the mobility of participants from all settlements. • A number of backyard food gardens existed with a size not larger than 0.1 - 0.2 hectares in all three villages. 	
<p>Political</p>	<ul style="list-style-type: none"> • There was no participation of poor people living in the settlements in water-related decision-making processes on municipal or provincial level. • Besides the tribal leader of the village of Koffiekraal, who knew about the NWA 1998 and was able to understand the legal language, none of the participants had knowledge about the NWA 1998, the NWRS II, the NWPR 2013, or about the failed establishment process of WUA. • No knowledge existed about the fact that water from the Marico Bosveld dam (MBD) was legally allocated per hectare of land owned according to historical water entitlements (Schedule 4 license of Existing Lawful Use). A total lack of awareness of water institutions (besides the municipality) was evident. • The elected municipal ward councillor was known to participants, but he would only come once or twice a year, especially shortly before the elections. Otherwise he would never answer his phone. I frequently tried to phone him for 3 months to no avail. • However, the ward councillors of Ward 4 of the Moses Kotane municipality or the Ramotshere Municipality were not present in any case during the development of the establishment proposal for the Marico Bosveld WUA. • A document listing the agenda for an establishment meeting for the MBWUA I obtained in 2011. It was developed by an commercial farmer and was titled with "Marico Bosveld Interim Water User Association - Agenda of the Irrigators Meeting". 	<ul style="list-style-type: none"> • "No, those people fight for survival; they mostly have no interest in politics. They have simply no time to engage in these things, and then they are accused of not wanting to get involved" (Head of MRDP, September 2015, Skunisdrift).

APPENDIX 5: CONTEXTUAL OVERVIEW TABLE SUMMARIZING LIVELIHOOD FACTORS OF EMERGING FARMERS IN THE GROOT MARICO CATCHMENT

Agential resources and capabilities	Combined empirical findings: Agential resources and capabilities in the context of emerging farmers'⁹⁵ livelihoods in Koffiekraal, Skuinsdrift and Groot Marico	Participant statements
Human	<ul style="list-style-type: none"> • Participants described their well-being and livelihoods as “okay”; “very hard”; “not nice”. • Their mental and bodily health was in a relatively good state. All participants were however constantly worried about not being successful with their food gardening project, as they had invested money and time into their projects regardless of the scale and specific format. All participants looked tired and exhausted, which they said was due to a lack of clean water and limited nutritional intake. • None of the participants could afford a health insurance. All participants described to be constantly worried about the future of their children. • All participants described a constant ‘worry’ about health, the absence of employment opportunities and the socioeconomic fragility of their small farming enterprises. This livelihood fragility they explained to be due to a general lack of financial means; limited access to water; a timely unreliable supply; limited or dysfunctional equipment and a lack of knowledge and access to information. • In the rural communities of Koffiekraal and Skuinsdrift access to hospital and or ambulance services was described as very expensive. • None of the participants possessed the necessary financial resources to buy medicine in case of an illness. The money to pay for regular medical services was not available and only in cases of emergency or a severe illness they would pay for a visit to the doctor or the hospital. • All participants were in between 24 and 42 years old. Participants had limited formal education. Literacy was largely limited. The Afrikaans language was spoken by all participants on a basic level; the same was evident for English. None of the participants could write properly in English; reading and understanding it in legal texts presented a challenge to 	<ul style="list-style-type: none"> • “Life here is very hard my friend, very hard” (EF 2, Subsistence farmer, Koffiekraal, March 2016). • “Information here is the most critical issue, because a lot of times people just don’t know. We have to organise the people and teach them about water resources management, this is a key problem. We have to regroup ourselves and enforce water access” (Skuinsdrift community leader, Head of Skuinsdrift Development Project, Groot Marico -

⁹⁵ The categories of participants of ‘emerging farmer’ or ‘the poor living in the rural communities’, often overlaps in reality. In effect, participants from both groups could be called small-scale farmers. Using the category of ‘emerging’ is related to the dominant state narrative that to be a commercial farmer is the desired model to be aspired by upcoming black farmers. Thus, using water for large-scale economic agricultural profit-seeking purposes is the desired model that upcoming farmers have ‘to emerge’ into. ‘Emerging’ in this sense means to emerge on the agricultural market as a player in this competitive game.

	<p>all participants.</p> <ul style="list-style-type: none"> • All of the interviewed people described similar patterns of childhood and growing up: they worked on the farms of the commercial farmers during the Apartheid, or in the mines. Child labour was common during this period and they had to work to contribute to the family’s livelihood. They were able to go to the school when the livelihood situation allowed for them to spend time in school. • Knowledge about current or future policies, plans or strategies of water management in the area was non-existent. However, a limited knowledge and lack of access to information was often taken as ‘the given order of things’ and a diffuse body of ‘the government’ was often blamed for their livelihood situation. • None of the participants possessed knowledge about the formal procedures required for establishment and operation of the WUA. As such, none of the participants possessed knowledge about the political vision behind WUAs anticipated as a platform to transform water access and control for the previously disadvantaged. • Furthermore, expressed by all participants were a lack of knowledge, lack of access to information and a lack of access to governmental structures. This was mainly due to a lack of physical resources like technological means to obtain knowledge (computer, internet connection, smartphones) and a lack of means of transport. 	<p>September 2015).</p> <ul style="list-style-type: none"> • “If you don’t have the knowledge then people can just lie to you” (Community leader Skuinsdrift, September 2015, Koffiekraal).
<p>Social</p>	<ul style="list-style-type: none"> • Relationships among black emerging farmers in Groot Marico and Skuinsdrift area was described by the participants as “not organised”, “they go against each other”. • The relationship between black emerging farmers and white commercial farmers was described as “we learned to hate” “they have got the powers, we have nothing”; “some are good some are very bad”; “not all are bad people, there are those that help us also”. • Collaboration amongst EFs existed within the GMFP project. But the degree of organisation around water related issues was rather low. People farmed on this land mainly for subsistence purposes, but also selling their produce locally for a small profit, which they partly re-invested into the project, had no knowledge about structures of water governance. • In the rural areas the tribal council and other smaller regular gatherings provided social structures through which people talked about issues regarding their livelihoods in the villages. The tribal authority was acknowledged by the national and provincial government. Subsequently, for the village of Koffiekraal a secretary existed acting as a bridge to the municipal structures and as a first instance for contacting the tribal council. For many people in the rural villages, the national government was far away, they felt frustrated by a lack of progress with jobs, water and economic development from which they would benefit. The authorities were perceived as belonging to ‘the government’ and differentiations between Departments were not made. • The subsistence farmers in Koffiekraal however did not know that the local office of DWS was right next to the MBD and they also had no knowledge that this was the office where people with a water entitlement would order their irrigation water. • Collaboration between EFs and CFs in water related matters existed, but to a very small extent. Two commercial 	<ul style="list-style-type: none"> • “We still battle with the one’s that got chased away from the farms [now living in Koffiekraal]. They’ve got nothing, so we have to help them. But we don’t have enough even for us. So they must stop coming” (Tribal leader of the Hurutse chieftain, September 2015). • “This guy [the commercial farmer], he put the sprinklers over our house day and night, so we had to leave” (Local farm worker evicted from a farm near Koffiekraal,

	<p>farmers helped the agricultural project passing on their knowledge about cultivating chillies, stopping by from time to time. However, that was the exception; a practice of sharing information of those who had it (the commercial farmers) and those that were in need of it (the emerging farmers and poor people living in the settlements) was not present. Rather the opposite was prevalent: the two emerging farmers of the project explained that the influential commercial farmers shunned those who helped the project, “they are ignoring them now and one has gone already, he sold his farm”.</p> <ul style="list-style-type: none"> • All participants perceived their relationship with the commercial farmers as one of a fierce competition for the same natural resources: water and land. • However, the tribal leader operating under the authority of the Hurutse chieftain had, with the help of social development workers from the University of South Africa formed a Community Property Association (CPA), which put forward legal claims to formerly traditionally owned land along the Marico River. The existing tribal structures as a platform for collaboration on the matters of land claims and founding the CPA provided highly conducive in the process, due to their social acceptance, legitimacy, transparency and rather representative structure. These claims were successful, in 2015 and 2016 producing a situation, in which approximately 400 hectares of the land under irrigation with water from the MBIS was given to the Bahurutse from Brakuil, Pella and Koffiekraal. 	<p>September 2015, Koffiekraal).</p> <ul style="list-style-type: none"> • “No, I don’t chase them [the formerly on-farm workers] away. I tear down their house and then they go by themselves”(CF A, March 2011 Groot Marico). • “I am eating from other’s plates. Now I am eating from your plate” (EF 2-b1, Skuinsdrift, and September 2015). • “It is problems with the white farmers; they are trying to break the project” (EF 1-b1; Skuinsdrift, March 2016).
<p>Economic/ Financial</p>	<ul style="list-style-type: none"> • None of the emerging farmers was formally employed. All of them had worked on the fields of the commercial farmers surrounding Koffiekraal and Groot Marico. Some of them still did. Through their farm work in the Apartheid’s racialised agrarian structure, they, however, obtained a considerable degree of knowledge about the basic farming techniques. • The Dept. of Agriculture funded an agricultural project of Groot Marico Fresh Produce (GMFP) through its scheme of financial grants. In 2011 participants of the project struggled with curtailed funding, limited financial means for farm improvements, limited agricultural knowledge, broken water tanks and a lack of equipment. In 2016 the members of this small-scale project had been given a new greenhouse, an additional water tank, and new equipment, including a small truck. The project cultivated cabbage and spinach on three hectares had grown in numbers and two more emerging farmers developed additional fields for cash crops like Chillies, but also cabbage. This was described as “very good” and a “good step”, but access to water was still a major obstacle to socioeconomic development with the potential to have a positive effect on local livelihoods. • Access to water was limited. Water in the GMFP was abstracted illegally from the Groot Marico River digging trenches and diverting part of the river flow onto the fields. A rainwater tank augmented the supply. However, participants from explained that a lack of water and finances would be the largest obstacles to their farming activities, followed by 	<ul style="list-style-type: none"> • “We don’t farm at the moment, because of the problems. It is problems with the white farmer(EF 2-b1, November 2015). • “We don’t have [access to finance], we don’t even have a jobs” (Tribal leader, Koffiekraal, September 2015)

	<p>equipment and limited knowledge about farming techniques.</p> <ul style="list-style-type: none"> • Livelihood strategies besides taking up daily jobs on the farms or in the mines comprised brewing traditional beer, small hair salons and brick making or selling collected firewood on the side of the road. Some received monthly government grants for children of R 3 000, which was often the only source of income for a whole family of four to six people. Some others had experiences in plumbing through their work with the irrigation system and offered their work to the public. • None of the participants wanted to disclose the amount of money they had available per month. • The fifteen small-scale subsistence farmers lived in three houses belonging to three different families, connected through marriage. Men and women attended the mostly small fields of below 0.1 hectares on which they cultivated mostly spinach, beetroot and cabbage. • On the neighbouring plot a feedlot for cattle was located, on which a 50-year-old herder tried to keep his animals alive. “You see, I give them this dry hay or they eat some branches of the bushes here to keep their stomachs running. But I don’t have the grass, because of no water” a small-scale subsistence farmer in Koffiekraal explained. • Except for the one raising cattle, none of the participants had financial savings or any other material assets besides the house they were living in. • All participants explained that access to finance would be a huge problem. None of the participants would qualify for a financial loan from a bank not having any assets to offer as collateral. 	
<p>Physical</p>	<ul style="list-style-type: none"> • EF 1 and 2 lived in small brick houses of around 25 square meters with their extended family of ten people on the land of the village in Koffiekraal. They were chased away by the farmer on whose property they had lived all their lives. • EF 3 and 4 also lived in brick houses in the town of Groot Marico with their respective families. Water was delivered by the municipality to in-house taps. • All participants had little furniture in their house, the walls and the ceilings had cracks and the roof was oftentimes leaking. In their backyard gardens they mostly cultivated spinach, carrot, beetroot, and millies (maize). • None of the participants had a personal computer or a smartphone, except the tribal leader of Koffiekraal who was given a laptop by researcher from the University of South Africa. Using the computer, however, presented a great challenge. However, all participants had a mobile phone, but without internet access, which was limited in the area 	<ul style="list-style-type: none"> • “You know, without the [food] gardens, I don’t know if we could make it. But the problem is water, too little water” (EF-b2, November 2015, Koffiekraal).

	<p>anyway.</p> <ul style="list-style-type: none"> • EF one and two (b1) in Skuinsdrift had no irrigation infrastructure anymore, as it was stolen from their property by the time ‘the mentor’⁹⁶ left their fields. They suspected he had sold the draglines or had transferred them to his property next to the MRDP, but had no evidence. However, they owned an old pick-up truck. • EF three and four never had any form off irrigation system, apart from diverting water from the Marico River onto their fields by digging trenches with a shovel. They also had no transport vehicle of their own, but the GMFP project was given a small truck for transporting their produce to local markets, or better, for driving to the location, where they would stop and wait for customers. 	
<p>Political</p>	<ul style="list-style-type: none"> • None of the participants had personal contacts into the DWS. None of them had ever participated in any of the WUA establishment meetings form 2007 to 2011. All participants however knew the commercial farmers who constituted the WUA establishment committee by name and had mostly worked on their fields. The proposed president of the WUA was CF A (the mentor) and CF B was proposed to be the vice-president and treasurer. • EF 1 and 2 were present in the final WUA establishment meeting described in the analytic narrative in the beginning of Chapter 6. However, they were not involved in the meetings developing the proposal for the MBWUA to be established from 2004 to 2011. • EFs 3 and 4 had never participated in meeting leading to the WUA proposal or the final establishment meeting. In fact, they had never heard about a WUA. • All participants expressed their frustration about not being involved and their voice not getting heard, not being helped by the government sufficiently. • According to participants of DWS and commercial farmers, Irrigation Boards never existed in the area under irrigation with water from the MBD. It had always been a government water scheme. 	<ul style="list-style-type: none"> • “We have no voice” (Tribal leader, Koffiekraal, March 2011, Koffiekraal). • “The government is not briefing us” (Member of the Tribal Council, Koffiekraal, March 2011). • “We have handed in an application [for river water], but this was two years ago. So we just take (EFs 1 and 2 – b2, September 2015, Groot Marico).”

⁹⁶ The mentorship program of the SA government relates to a condition for receiving a financial grant from the Department of Agriculture and Rural Development. This condition is that a ‘mentor’ is supposed to support the ‘emerging farmer’ in their farming endeavours sharing his knowledge and expertise especially on the business side of farming. This business side, or planning and financial management had been identified by the government reassessing the program in 2009 as a challenge for people with often limited literacy. Their lunatic idea however was to use the commercial farmers as teachers, as mentor for those lacking the formal knowledge about a farming business. This sounds like adapting governance structures while attempting collaboration, but in fact it opened up the ‘room to manoeuvre’ for the vested interests to assert their power, by taking control of the poor, black farmers businesses. This happened, so to speak, through the back door of legal regulations. This is often labelled ‘elite capture’ or ‘regulative capture’ and created a situation in which the former yearlong boss of black farm workers was now supposed to support his former black employees to farm profitably. This absurd concept meant that white privileged farmers who had benefitted from labour exploitation of black farm labourers all their life, where now supposed to raise their own economic competition altruistically providing their knowledge about farming and water management.

		<ul style="list-style-type: none"> • “What I experience in Skuinsdrift, people who benefitted most in the last 10 years is the white commercial farmers, mostly because they can store water and they have better access to water through their contacts to the local office” (Community leader Skuinsdrift, Head of Skuinsdrift Development Project, Groot Marico - September 2016).
<p>Natural</p>	<ul style="list-style-type: none"> • Participants EF 1 and 2 owned “maybe around 45 hectares” of land. It was financed by the Dept. of Agriculture and through a grant of R 390 000 for the purpose of purchasing the land, equipment and agricultural input resources such as seeds and fertilizer etc. • Participants 1 and 2 in principle, were entitled to water from the MBD distributed via the open canal system of the Marico Bosveld irrigation scheme. However, due to “problems with the white farmers” and due to a total lack of experience in managing a business or an agricultural project, they had never actually farmed on the land they were given, but had rented it to the ‘mentor’ for his economic use. They were also employed by this mentor, working on their own land for the same person they worked all their life. This mentor (Commercial farmer A in this study) promised in a verbal agreement to pay the loan for the land, which the EFs had bought from Landbank. • The mentor helped EF 1 and 2 with the paper work and arranged some of the equipment purchases for them. However, the equipment was not in a good condition; the amount of maintenance required to fix the irrigation system was considerably costly. Developing the land for irrigation farming also meant to prepare the soil, clear vegetation that had grown in between the purchase and the start of the development. The money was quickly spent also for the purchase of 10 cattle. The whole farming project was not adequately planned and the emerging farmers had no knowledge about the financial, managerial and the business aspects of farming. • The land of around ten hectares worked on by EFs 3 and 4 and their extended group of additional ten people from Groot Marico and also Pella was located at the edges of the town of Groot Marico and was owned by the Department of Land Reform and Rural Development. It comprised two greenhouses made out of a metal skeleton and plastic covers used to grow tomatoes and also a water tank storing rainwater, as well as two fields for cabbage, spinach and 	<ul style="list-style-type: none"> • “The challenge here is water. We rely on the rain, despite this big dam [MBD]” (Small-scale subsistence farmer in Pella, November 2015, Koffiekraal). • “You know, the biggest problem is money. The second is water” (EFs 1ans 2 - b2, March 2016. Groot Marico). • “The canal [dug with a shovel to divert part of the Marico River onto the fields] is often dry. We have to be early in the morning to use what is available.” (EF 4 of Groot

	<p>chillies. The chillies were supposed to be sold to the agricultural cooperative in the next town, same as the good quality cabbages and spinach produce. The vegetables were sold locally from the back of a truck. The water tank was broken in 2011. A new one had been provided by the Department of Agriculture, but was described as to be empty most of the time.</p> <ul style="list-style-type: none"> • EFs 3 and 4 (b2) worked together in the greenhouses and on the open fields; they diverted water from the river onto their fields illegally. Participants explained that they had applied for a formal water entitlement two years ago, but had never received an answer. • None of these 'emerging farmers' possessed a private borehole, and none had the financial means to pay for one to be drilled. This was also the case for the agricultural project. • All participants described a lack of finance, water and only limited knowledge about farming and management as the greatest threat to their livelihoods, and thus, those of their families. 	<p>Marico Fresh Produce Project, March 2011, Groot Marico).</p> <ul style="list-style-type: none"> • "We don't have enough water" (EF 2 - b2 of Groot Marico Fresh Produce Project, March 2011, Groot Marico). • "And in dry years there is nothing left from the stream, a little trickle if they are lucky. The rural farmers there don't get any water from this source, because they are at the bad end of the river" (Head of Groot Marico information centre, June 2015, Groot Marico.)
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APPENDIX 6: CONTEXTUAL OVERVIEW TABLE SUMMARIZING LIVELIHOOD FACTORS OF COMMERCIAL FARMERS IN THE GROOT MARICO CATCHMENT

Agential resources and capabilities	Combined empirical findings: Agential resources and capabilities in the context of commercial farmers' livelihoods living in the Groot Marico catchment	Individual participant statements <i>(Interviews conducted in March 2011; January, June and November 2015 and January 2016)</i>
Human	<ul style="list-style-type: none"> • Participants' mental well-being and bodily health were generally in a good state. The well-being and livelihoods were described as: "good", "no complaints"; but also as "excellent". • All research participants and their family members were able to afford private sector health cover. Access to hospital and ambulance services presented no challenge. All participants had formal education; one had a University degree in agricultural management. CF B had been the head of the local police for 25 years before moving into the farming business. • All had sound knowledge of the English language. Understanding of oral and written English in a legal context posed no challenge to participants. • All participants were well informed about current or future policies, plans or strategies of water governance in the area. Participants possessed excellent knowledge about the process of WUA establishment in the Groot Marico area; all of them were actively involved in the process from the beginning of the process in 2007 onwards. Knowledge about the roles, responsibilities and powers a potential WUA would have had, and thus knowledge about a WUAs practical relevance for their livelihoods was evident among all commercial farmers. • All participants had knowledge about the NWA 1998, NWRS II, the NWPR 2013 and about the plans of the DWS for future CMAs and WUAs in South Africa. 	<ul style="list-style-type: none"> • "I know the law, you have to if you want to be successful with farming" (CF B, September 2015 Groot Marico, 2015). • "The NWPR 2013, jesses, now they want to dis-establish the WUAs again. They have no idea what they are doing" (CF A, September 2015, Groot Marico).
Social	<ul style="list-style-type: none"> • A strong tradition existed to collaborate among white farmers on issues of water access and control. This was expressed in the membership of the same people in agricultural, security or water related committees. • Participants met regularly in the local tavern, which was the unofficial centre for white commercial farmers. The local police also was a regular customers in this bar just outside the town of Groot Marico. • All commercial farmers in the area were members of the Marico Bosveld Farmers Unions and participants CF A was the head of this Association and also the head of the Zeerust Farmers Union and the AgriNorthwest. • All participants were part of AgriNorthwest, the local chapter of the countrywide agricultural lobby organisation AgriSA. Within this chapter - supported by the national headquarters in terms of knowledge, logistics and finances - they had developed a system of thematic committees as platforms for collaboration in each major field important to their livelihoods as commercial farmers. This meant for example a "red meat committee" for the cattle farmers, a committee for "farm security", a "tobacco committee" and a "water committee" and so forth. 	<ul style="list-style-type: none"> • "It's always the same people that you will find on those committees" (CF A, Groot Marico, 2015). • "I am the manager of the two farmer's unions, Zeerust and Marico-Bosveld" (CF A, September 2015, Groot Marico). • "They make everything

	<p>The latter was described as the most important and most active by participants CF A - C. The members of the committees consisted exclusively of white males. It was this group of farmers who developed the establishment proposal and the Constitution for the Marico Bosveld Water User Association (MBWUA) excluding other interested parties.</p> <ul style="list-style-type: none"> • The degree of organisation around issues of water was evidently high. Beside the above-mentioned, the committee for “farm security” for example also participated in the municipal meetings regarding security and crime, in which the local police captain was also present, and sometimes a member of the local provincial government. • The proposed president of the proposed MBWUA would have been the same person, who was the spokesman of the Farmers Association, the head of AgriNorthwest committee on water, the Marico Catchment Conservation Association and also the same person, who attended the meetings of the municipality together with participant CF B. It was furthermore the same person who was proposed as a central figure on the proposed CMA management board. This was CF A. • An elite group existed within the group of the commercial farmers according to a historically grown hierarchy. The core of influential farmers was centred on the water committee. Members of it were the farmers possessing the largest pieces of land; having excellent contacts to the local police. Contacts to the national DWS and the local DWS office operating the Marico Bosveld dam were generally described as “good” or “strong”. Governing the timely water distribution to the farmers opening the dam outlets, sluices and weirs of the open canal system, this office occupied a central position. • A deep reluctance to speak about water allocations and the amounts used existed. Commercial farmers interviewed twice, made conflicting comments, sometimes even during the same interview. Participant A changed the size of his farm from 20 hectares in the beginning of the interview to 43 hectares in the end of the interview. Participant B, however, explained that participant A would own around 250 or more hectares and that he would hold considerable shares together in other farming projects under the MBIS. 	<p>difficult. As soon as politics get involved, it gets tricky. Transformation is the new Apartheid”(CF B, March 2011, Lekkerbreek).</p> <ul style="list-style-type: none"> • “Now you have to manage the local police as well. You have to make them nicely aware of your issues, you know, so that they can act accordingly. This is Africa” (CF A, September 2015, Groot Marico). • “Solidarity among us is quite strong” (CF C, November 2015, Groot Marico).
<p>Economic/ Financial</p>	<ul style="list-style-type: none"> • None of the participants faced any risk of unemployment or has ever been unemployed. • The daily work of a commercial farmer comprised administrative and supervisory activities; besides commercial farmer CF B none of the commercial farmers interviewed for this study was actively involved in the practical agricultural labour on the fields. This however meant that they were active on their feet working mostly from 06:00 to 17:00, for example readjusting the overhead sprinkler system, ordering water from the local DWS office on a paper form filled out by hand; fixing a leak of a sprinkler system; checking the canals, fences and security measures; overlooking various farm activities or purchasing new supplies and farming equipment. However, only commercial farmer C still used manual drag lines for irrigating a couple of hectares. Large pivot sprinklers were the main irrigation technique or mechanised overhead sprinklers. • All of the participants had sufficient agricultural equipment, such as tractors, ploughs and irrigation infrastructure. 	<ul style="list-style-type: none"> • “It is quite possible for us farmers to get loans” (CF A, September 2015, Skuinsdrift) • “Access to finance is generally good, no problems”(CF C, November 2015, Groot Marico) • “These days you never know how much someone has put under the table to get more

	<p>Private transport was not a challenge for any of the participants, they all owned cars for farming purposes and one or two additional cars for private purposes.</p> <ul style="list-style-type: none"> • Crops farmed were tobacco, maize, barley, soy beans and wheat in the winter season. Running game farms for hunting and/or recreation purposes and guesthouses for other tourists were growing sectors as more and more commercial farmers were leaving the agricultural business. • All participants explained that access to finance was not a problem, neither private nor for the farming enterprise purposes. None of the participants had any financial problems. • Taking up a loan at the beginning of the year to purchase farm input commodities like seeds and fertilizer and paying it repaying the bank after the harvest was common practice of all interviewed farmers in the area. This however depended on annual yield and international market prices for the respective crop farmed (tobacco, maize, barley, chillies, wheat). • One hectare of developed farmland under centre pivot irrigation had a value of R 100 0000 to R 200 000. • All of the participants had private savings and other assets. None of them wanted to disclose the actual amount or value. However, earnings in all cases covered their and their wife’s living costs and those of their 1-4 children. All participants without exception were able to afford tertiary education and health insurances for their children. • All participants had the financial means to pay bribes to DWS officials. 	<p>water. It is a corrupt business” (CF C, February 2015, Groot Marico)</p> <ul style="list-style-type: none"> • “If our properties don’t get water they are basically worthless. We have to have water for farming, but also for the value of the property.”(CF D, February 2015, Groot Marico) • “We had a year were the maize prices were below a certain range and that was difficult. And droughts. But I then diversified to other sectors outside agriculture, to cover up losses and as a backup” (CF C, February 2015, Groot Marico) • “We farmer mechanize and computerize and need less and less labourers, that’s a good thing for us, because you can’t rely on those people” (CF C, June 2015).
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<p>Physical</p>	<ul style="list-style-type: none"> • All participants lived in privately owned farmhouses on their estates. • All participants had sufficient farming equipment. From tractors and ploughs to irrigation means and transport vehicles. Two participants used large-scale overhead sprinkler systems and klap-klap⁹⁷ sprinklers were used on different parts of a farm. However, single, centre pivot sprinklers were mostly used. Digital surveillance of irrigation systems was only used by one participant; soil moisture was measured and the Irricheck software applied to steer the irrigation system. Micro-jet irrigation or drip irrigation was not used in the study area. • From 2016 onwards the multinational company of Monsanto offered the use of their satellite technologies to the CFs in Groot Marico, who use Monsanto products, such as seeds and fertilizer called Roundup.⁹⁸ • Access to latest technology was evident. Personal computers and smartphone with internet connection, as well as a telephone landline were standard communication devices for all participants. • The Groot Marico Irrigation Scheme was owned and operated by the DWS. Farmers filled out a form with the amount of water and the time period of delivery and ordered water from their allocations a week in advance. From the MBIS open concrete canals constructed in the 1960s distributed the water to the irrigators downstream of the dam; the river was used as a conveyer to some extent. The water from Kromellenboog dam contributes into the system of canals on the southern side of the Marico Bosveld irrigation scheme. • The weir at the property of the farmer was operated by staff of the local office of DWS. From there it was up to the farmer what to do with the water. All participants possessed on-farm dams in which they stored their daily water. All commercial farmers explained to have increased the capacity of their on-farms dams. And all of them confirmed to store it for longer time period than a day without having the formal license to do so. Further distribution was done with electrical pumps or using gravitational force. • Besides their allocations from the Marico Bosveld dam (MBD), all participants used groundwater to augment their allocations. None of them wanted to disclose the amount of water allocated through Schedule 4 water licenses of Existing Lawful Use (ELU). However, participant A explained that a large proportion of the water used for irrigation would mostly be “historical rights, yes” (CF C, November 2015, Skuinsdrift). 	<ul style="list-style-type: none"> • “We are using the big center pivots, or the linear ones for the small plots. They move by themselves and how far; you program them with the amount of water to put down. And some klap-klap sprinklers.” (CF B, September 2015, Skuinsdrift). • “Many pump illegally from the river nowadays. There is no control, but sometimes it can be detected”(CF A, September 2015, Skuinsdrift). • “But the reason is that it is cheaper to start something illegal, pay the fine and the let it sort out by somebody else. Then you are sure it is already there and you created facts that cannot be reversed. That’s how things work with water here” (CF C1, March 2016, ‘Croc Inn’ a local farmers bar near Groot
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⁹⁷ Klap-klap sprinklers are the colloquial Afrikaans word for ‘impact’ or ‘impulse’ sprinkler head.

⁹⁸ This topic of Monsanto’s aggressive economic expansion strategy binding famers to their mostly GMO-based products and patents on plant and animal genes cannot be analysed in this thesis due to academic latitude. It is however, a highly topical issue gaining importance worldwide. In the Groot Marico catchment ‘Monsanto’ was mentioned by the all commercial irrigation farmers during the interviews. It was also a topic during the interviews with commercial farmers in the Hex River Valley.

		Marico).
Political	<ul style="list-style-type: none"> • Participants A-C were members of the planning and development committee for the establishment of the MBWUA. Within their organisational structures of farmer’s unions and AgriNorthwest related committees, participants were well connected to the DWS, the Ramotshere and Moses Kotane municipality, the local police, the DWS regional office at Hartebeesport dam and, most importantly, to the local DWS office operating the MBD dam. • Participants A and B were regularly participating in municipal meetings, meetings of the local police and were involved in the unsuccessful process of establishing a CMA by the time of writing. • From 2004 until 2011 commercial farmers interviewed during this study were actively involved in developing the proposed Constitution for the MBWUA. No other stakeholders were involved. No information was provided by the organising committee to other water users. • The regional office in Mafikeng was tasked with facilitating the process of WUA establishment, but it had inadequate human capabilities and financial resources to fulfil this political mandate. Two persons, the regional water manager and her secretary, were overburdened with their daily workload of managing water and “had no capacity to do the job”, said the secretary of the head of the regional office in Mafikeng. She continued: “On paper it all reads nicely, but in reality it [<i>the WUA</i>] is not working” (Senior manager at DWS, formerly involved in the MBWUA establishment process, March 2016, Pretoria). • A process of Validation and Verification (VandV) as commenced in the Hex Valley, had never commenced in the Groot Marico area. 	<ul style="list-style-type: none"> • “The Riekersdam [<i>MBD</i>] here was built by my fathers with shovel and hand. That is why we are a bit sensitive with our water, because we see it as something we have to guard and protect.” (CF C, September 2015, Skuinsdrift) • “Existing Lawful Use, yes, but it’s our water. They must not interfere with our water” (CF B, September 2015, Skuinsdrift). • “The WUA proposal went from us to them [DWS]” (CF A, September 2015, Groot Marico). • “The WUA, it is private” (CF B, March 2016, Groot Marico).
Natural	<ul style="list-style-type: none"> • All participants owned in between 40 - 50 (CF B) and 250 (CF A) hectares of land under irrigation. CF C possessed 200 h of land. The main crops cultivated were maize, tobacco, soy beans, vegetables, wheat and chillies. • Each hectare of land under agricultural production north of the MBD had an allocation of 5 300 cbm of water from the two dams. In total this is an irrigated from the dam accounted for of 2 700 hectares and another 1 500 irrigated with ground water. • The Groot Marico River was also used as a source of irrigation water by commercial farmers illegally. It was also used by some households alongside the dam. Illegal pumps were evident along the Groot Marico River. Illegal damming of the river also occurred. Inserting sand bags into the irrigation canals after the location of a meter to divert the flow into diversion canals was a common practice used by commercial farmers to obtain more water; storing the water for longer than one day was also a common practice, although by law (NWA 1998) it was 	<ul style="list-style-type: none"> • “DWS also opens the valves at your farm. It is metered. After 5 300 cbm [per hectare] they [DWS] stop it” (CF C, September 2015, Groot Marico). • “I can only store it in my dam [on the farm]. But you only store for the day, because if you keep it longer you have

	<p>required to obtain a storage license for this. However, illegally abstracting river water was cheaper than any other water available in the area and accessible mostly throughout the year.</p> <ul style="list-style-type: none"> • Access to groundwater and the physical means to pump it onto the fields was evident for all participants. • A limited and unreliable supply of electricity was described to present a challenge described by all participants. A lack of water, failed harvests, crime, as well as crop and animal theft were described as a difficulty to their livelihoods, but not a threat. 	<p>to have a storage license for the dam” (CF C, September 2015, Skuinsdrift).</p> <ul style="list-style-type: none"> • “Some of them are stealing water like nothing” (DWS water scheme operator, January 2016, Groot Marico). • “Farming is too serious a thing to be left for politicians. They mustn’t decide about food production or water, it is not their business. We know how to do it” (CF C, September 2015, Skuinsdrift).
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APPENDIX 7: CALCULATING THE WATER CONSUMPTION IN THE HEX VALLEY FOR THE PRODUCTION OF TABLE GRAPES

In an average year, 18 million cartons⁹⁹ of table grapes were produced in the Hex Valley. Each carton contained nine boxes of 500 gr, as we know them from the supermarkets. Each carton was thus equivalent to 4.5 Kg of grapes. Through the interviews with commercial farmers, I confirmed a water requirement per kilogram of table grapes of 290 - 300 l of water for the Hex Valley. The following calculations are based on this empirical information:

1)

18 000 000 (cartons) times 4.5 kg equals 81 000 000 kg of grapes produced and packed for the transport to Cape Town harbour. Furthermore, 81 000 000 kg of grapes times 290 litres of water equals 23 895 000 000 litres.

This meant that 23 895 000 cubic meters of water were used each year to produce table grapes. These again only accounted for the grapes packed into cartons and not the amount of the produce that was not packed, due to damage or not fulfilling the quality standards. Exemplifying the vastness of this amount: it equals roughly 9 500 Olympic swimming basins full of water, as one Olympic swimming basin contains 2 500 cbm of water.

However, the 18 million cartons of annual table grape production might not represent a reliable number in terms of the actual volume of water used. Another calculation might provide more insight.

2)

In the Hex Valley 5 200 hectares under irrigation were utilised to produce table grapes in 2013 (Department of Agriculture, Forest and Fisheries 2014). Research participants (commercial farmers CF 1, 2, September 2015 DeDoorns) also explained that per hectare of table grape cultivation 7 500 cbm of water would be required on an “average year with good rainfall” to get a yield of 4 500 cartons (20 250 Kg) of grapes of good quality (Commercial farmers CF 2 and 3 2015 DeDoorns). So I calculated: $5\,200\text{h} * 7\,500\text{cbm} = 39\,000\,000\text{cbm}$.

According to research participants in a rather dry year with only little precipitation and higher temperatures, 8 500 cbm to 9 000 cbm of water would be required per hectare to achieve the same results for economic viability. So instead of 39 mio cbm/a, this would mean a total water consumption of 44.2 mio cbm/a, respectively 46.8 mio cbm/a for commercial irrigation purposes.

However, the difference between 23.8 cbm/a and 46.8 mio cbm is significant. If 7 500 cbm water per hectare lead to a yield of 4 500 cartons with each a weight of 4.5 Kg, then then another calculation might shed further light on the water consumption.

⁹⁹ <http://www.freshplaza.com/sector/203/South-Africa> (accessed: 13.12.2014).

3)

To grow one kilogram of table grapes required 290 litres of water in the Hex Valley. 4 500 (cartons yield per hectare) multiplied by 5 200 hectares equals 23 400 000 cartons potentially harvested annually in the Hex Valley. This seems an appropriate number considering that the average total production of table grapes was 18 million cartons.

Thus, the initial calculation needed to be repeated to get another approximate benchmark:

$23\,400\,000 \text{ (cartons)} * 4.5 \text{ kg} = \underline{105\,300\,000 \text{ Kg}}$.

$105\,300\,000 * 290 \text{ (litres of water)} = 30.537.000.000\text{l} = \underline{30\,537\,000 \text{ cbm/a}}$