

**THE ECONOMICS OF INSTITUTIONS, INSTITUTIONAL GOVERNANCE AND EFFICIENCY: THE
CASE OF WATER DISTRIBUTION IN LOWER SUNDAYS RIVER VALLEY**

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DECLARATION

I, the undersigned, hereby declare that the work contained in this assignment is my original work, and that I have not previously in its entirety or in part submitted it at any university for a degree.

Signature:

Date:

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ABSTRACT

The institutional dynamics, policies and legislation that were prevalent during the apartheid era have left imprints that are difficult to ignore as they still dictate the interaction between different elements in the water sector to date. During the apartheid era, the formulation of policies was informed by racial segregation, resulting in a socio-economic pattern that dictated the distribution and access of resources for the people of different races in the country. Post-apartheid, the National Water Act has established the basis for management of water resources on a catchment basis (for equity, efficiency and sustainability), and the Water Services Act aims to ensure everybody has access to basic water supply and sanitation services.

Regardless of the improvements in water supply to the rural sector made by the South African government, many of the current patterns of water use are still characterised by inequality, inefficiency, and inadequacy. The poor remain marginalised, and emerging farmers and poor rural communities have limited access to water resources while water continues to be used inefficiently by some farmers in the agricultural sector with few incentives to improve its water use efficiency.

Despite the existence of the thriving citrus industry in the area, around 60% of people in the Sundays River Valley Municipality (SRVM) live below the poverty datum line. The inequality between the municipal populace and the commercial citrus industry is noticeable and the inequitable water redistribution is prevalent in the Lower Sundays River Valley (LSRV). The problem of disrupted water supply is prevalent in the catchment. However, there is also currently no physical shortage of water in the catchment. Therefore, the currently experienced problems with water supply in the LSRV are consequence of a lack of effective institutions and infrastructure, not of physical water scarcity.

It is argued in this paper that there is a notable lack of understanding about the design of institutions for water management in developing countries. The vast majority of research on water management and access is premised on neoclassical economics ideas related to

water markets and pricing among others. The neoclassical economics approach, however, does not adequately define the role of institutions in shaping the direction of water access and supply.

This study uses new institutional economics (NIE) arguments to define the institutional arrangements and dynamics defining the water sector in South Africa, using the Lower Sunday River Water Users Association (LSR-WUA) as the case study. It aims at analysing the institutional governance and performance of the using equity, efficiency and effectiveness as key indicators. The various research methods employed in this study include; interpretive and post-positivist paradigms, quantitative and qualitative research, the case study research method and in-depth key informant interviews.

It is concluded that that the current and future decisions made by the LSR-WUA are not entirely independent of those made in the past under Sundays River Irrigation Board (SRIB). The thesis argues that such factors as old effective networks, vested interests of commercial farmers, sunk costs towards the building of canals, among other factors, may have influenced the dependence of the LSR-WUA on the SRIB's set path. It is further concluded that the absence of contractual agreement between the LRS-WUA which acts as the bulk water supplier, and the SRVM which acts as both the water services authority (WSA) and the water service provider (WSP) creates an institutional arrangement deficiency. Such an institutional arrangement vacuum can lead to a failure of the water institutions in the catchment to provide water resources effectively. The study further argues that because the post-apartheid National Water Policy of South Africa is largely influenced by neoclassical economics foundations, the desired results in the water sector, such as equitable distribution of water resources, have not yet been fulfilled completely.

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ACRONYMS

AGM	Annual general meeting
CMA	Catchment Management Agency
CMS	Catchment Management Strategy
CPR	Common pool resources
DWA	Department of Water Affairs
DWA-RO	DWA regional office
DWAF	Department of Water Affairs and Forestry
FBWP	Free Basic Water Policy
GWP	Global Water Partnership
IAD	Institutional Analysis and Development
IWR	Institute for Water Research
IWRM	Integrated Water Resource Management
LSR-WUA	Lower Sundays River Water Users Association
LSRV	Lower Sundays River Valley
Mm ³ /a	Million cubic meters per annum
MSA	Municipal Systems Act
MWEA	Ministry of Water and Environmental Affairs
NDP	National Development Plan
NIE	New Institutional Economics
NWA	National Water Act
NWRS	National Water Resource Strategy
PPP	Public-Private Partnership
SAAFWUA	South Africa Association for Water User Associations
SAGO	South Africa Government Online

SRIB	Sundays River Irrigation Board
SRVM	Sundays River Valley Municipality
UNDP	United Nations Development Programme
WB	World Bank
WPP	Water Partnership Program
WRC	Water Research Commission
WSA	Water Services Act
WTW	Water Treatment Works
WUA	Water Users' Association

CHAPTER ONE

INTRODUCTION AND RESEARCH CONTEXT

1.1. Introduction

Water has been identified as one of the integral drivers of socio-economic development (Global Water Partnership (GWP), 2012). Despite this crucial role, it is estimated that approximately one in nine people worldwide lack access to safe, reliable and clean water resources (GWP, 2012). In most developing countries, the discrepancies in water supply and access have been caused by the failure of governments and water institutions to appreciate water as an economic good and/or to at least recognise that water has social and economic value in its various competing uses (Savenije and van der Zaag, 2002; Saravanan *et al.*, 2009; GWP, 2012).

Although water does not possess the primary traits of a typical 'economic good' except the rivalrous condition, it can, however, for purposes of institutional economic analysis be viewed as an economic good (Sharma, 2012). The parlous state of water resources around the world necessitates that water be treated as an economic good and should be subject to appropriate valuation (Van der Zaag and Savenije, 2000). Savenije and van der Zaag (2002) state that treating water as an economic good also implies improving efficient allocation of scarce water resources through adopting integrated decision-making among all stakeholders.

The Integrated Water Resource Management (IWRM) concept enshrined in the Dublin Principles aims at balancing diverse and multiple sectoral interests (Saravanan *et al.*, 2009). In order to achieve this, it is argued that it is important for policy-makers to account for the biophysical characteristics of water, as well as to consider the economic, social and environmental concerns. The IWRM principle "limits the applicability of neoclassical economic principles" (Rockstrom, 2013: 4).

The concept of IWRM was developed in the 1990s to facilitate sustainable water resource management and use, and has continued to be influential in the water sector to date (GWP, 2000; Braga, 2001; Saravanan *et al.*, 2009). The underlying philosophy of the IWRM process is to “promote the co-ordinated development and management of water and land so as to maximise economic and social welfare without compromising the sustainability of vital ecosystems” (Haigh *et al.*, 2010: 475). IWRM is an approach that aims to address persistent problems in the water sector such as institutional inefficiencies, poor service delivery, a lack of integrated planning and allocation of water resources, and lack of participation of some relevant water sector stakeholders (Milly *et al.*, 2008; Du Toit *et al.*, 2011).

IWRM is progressively being embraced at national level, with water resources legislation and policies amalgamating IWRM ideologies. Countries such as Mexico, Brazil, Zimbabwe and Thailand have espoused the principles of IWRM in their water policies (Orne-Gliemann, 2008). Similarly, South Africa’s water policy and legislation are argued to be reflective of the broad objectives of IWRM (Colvin *et al.*, 2008; Anderson *et al.*, 2008). In South Africa, the National Water Act (NWA) of 1998 promotes integrated and decentralised water resource management in order to attain its objectives of equity, sustainability, representativity and efficiency. The National Water Resource Strategy (NWRS) is used to describe the legal frameworks and implementation strategies of water policy. However, Anderson *et al.* (2008: 666) argue that an “Over-emphasis on the policy and legislation component leaves little benefit to those on the ground and does little to effect real change or promote poverty reduction”.

According to Colvin *et al.* (2008), the small and/or unsatisfactory benefits of IWRM to local communities can be attributed to the lack of a standardised definition of IWRM, and the absence of a clear definition of what exactly should be integrated and how. Colvin *et al.* (2008) argue that even though the South African water policy is progressive, if there are no progressive implementation strategies in place, then it is almost impossible to achieve the broader aims of the policy. The authors recommend that, given the complexity of water as a resource, a progressive approach to implementing water policy is not only dependent on the establishment of effective and efficient water institutions, but also on embracing iterative learning-by-doing as well as interactive learning across disciplines. Pollard and Du

Toit (2008) propose that IWRM is an appropriate approach suitable for managing complex systems as it necessitates a thorough understanding of relationships between various stakeholders in the water sector, thereby encouraging participatory and cooperative management of water resources.

While the participatory principle proposed by IWRM is valuable in water management, some argue that the IWRM fails to address complexities and power dynamics and/or differentials in the water sector (Saravanan *et al.*, 2009). According to Brown (2013: 273), “[a]n emerging body of evidence finds that power differentials impact negatively on the transformatory potential of participation”. It can hence be argued that the ability to address problems of institutional deficiencies and inadequate financial resources can be limited in the IWRM process (Saravanan *et al.*, 2009).

Institutional and natural resource economists have derived a model of the process of institutional change wherein both the economic environment and political environment in the natural resource sector are conceptualised (North, 1990; Challen, 2000). In the model, North (1990) describes how the interactions of humans and natural resource institutions in a political economy can create incentives to improve the utility derived from resource use given budget and technological constraints.

Institutions are defined as the “established rules, norms, laws and practices and any other arrangement put in place that can influence social change” (North, 1990). Institutions at international, national and local levels in the water sector play important roles in arbitration and conflict resolutions between and/or among stakeholders, monitoring of water service providers and water users, and implementing strategic and sustainable planning for efficient and equitable use of water resources (Sullivan, 2002). These institutions are faced with complex natural and financial resource limits (Sullivan, 2002; Saravanan, 2008; Saravanan *et al.*, 2009; Swilling, 2010; Lorz *et al.*, 2011), prompting new thinking about successful resource management strategies as well as sustainable resource use.

New institutional economists have identified a number of critical features of an effective water resource institution including: unambiguous objectives, adaptiveness, compliance

ability, technical rationality, good interaction with other institutions, political and organisational rationality, as well as appropriateness of scale and scope (Nystrom and Starbuck, 1981; Ostrom, 1992; Ackroyd, 2002; Gandhi and Crase, 2009). The scholars also argue that an equitable water resource institution should provide enhanced opportunities for social inclusion, be responsive to the needs of disadvantaged groups and be sensitive to local needs (Saleth and Dinar, 2004; Gandhi and Crase, 2009; Shen and Speed, 2010; Ostrom, 2011).

In South Africa, as in other developing countries, water distribution faces numerous challenges at different stages in the distribution channel from catchments to water users, resulting in inequities (Du Toit and Pollard, 2008; NWRS, 2013). According to Tapela (2013), the frequency, violence and geographical spread of service delivery protests related to water in South Africa have increased to unprecedented levels over the years. The prominent escalation of water related protests not only highlights poor service delivery in the water sector, but also brings to the fore institutional inefficiencies in the sector (Mouton, 2013).

The Lower Sundays River Valley (LSRV) catchment is not an exception. In spite of the thriving citrus industry in the catchment, the inequality between the municipal populace and the commercial citrus industry is noticeable with regards to water access. The problem of disrupted water supply is prevalent in the catchment (D'hont *et al.*, 2013). In September 2014, the local residents at Kirkwood, a town under the administration of the Sundays River Valley Municipality (SRVM), displayed their frustrations over water supply disruptions through violent protests that resulted in setting alight of municipal building (City Press, 2014). However, there is also currently no shortage of water in the catchment. The demand for water resources is not higher than the available supply, hence it can be argued that the water scarcity in the catchment is not physical (Food and Agriculture Organization (FAO), 2013). The currently experienced problems with water supply in the LSRV are consequence of a lack of effective institutions and infrastructure.

There is a notable lack of understanding about the design of institutions for water management in developing countries (Saleth, 1996; Gandhi and Crase, 2009). The vast majority of research on water management and access is premised on neoclassical

economics ideas related to water markets and pricing among others (see generally Brajer *et al.*, 1989; Brookshire *et al.*, 2002; Yang, 2003; Bakker, 2007; Debaere *et al.*, 2014). The neoclassical economics approach, however, does not adequately define the role of institutions in shaping the direction of water access and supply. Therefore, this study uses new institutional economics (NIE) arguments to define the institutional arrangements and dynamics defining the water sector in South Africa, using the Lower Sunday River Water Users Association (LSR-WUA) as the case study.

1.2. Goals of the study

The primary goal of this research is to analyse the institutional governance and performance of the Lower Sunday River Water Users Association (LSR-WUA), as a raw water supplier to various users, using equity, efficiency and effectiveness as key indicators, thus contributing to the body of knowledge in this area. This goal is addressed through defining the underlying economic theory behind the South African national water policy, and its impact on the overall institutional design and operations of water users' associations (WUAs).

The thesis also aims at describing the influence of the existing institutional and water governance arrangements, and economic dynamics in the LSRV in the efficiency, effectiveness and equity of water allocation in the catchment.

Through using IWRM as well as institutional and resource economics paradigms, the study will contribute to the small body of literature about the underlying institutional factors influencing water supply, management and access in developing countries.

1.3. Methods to be used

Institutional governance and institutional framework analysis form the fundamental foundation of the study, enabling the exploration of relevant governance dynamics and mechanisms in the water allocation and distribution process (Henderson, 2011; Lee and Cassell, 2013). Hence, a narrative approach using literature and document analysis will provide an insight into the economic and institutional history of the LSRV. The influence of

economics and historical paths on the current institutional and governance arrangement in the LSRV will be investigated through both the selection appropriate institutional frameworks using the literature and the application of the framework to the institutional and governance analysis of Clifford-Holmes (forthcoming) and Clifford-Holmes *et al.* (2013). This study will be intensively investigating the LSR-WUA with close reference to the research questions, in order to illustrate path dependencies, contexts and values that define the current state of institutions. Therefore, the post-positivist and interpretive research approaches (defined in chapter six) serve as the core paradigms for this study (Wildemuth, 1993; Schratz and Walker, 1995; Henderson, 2011; Sharp *et al.*, 2011). The data required for analysis are both quantitative and qualitative in nature. A qualitative approach would enable the research to conduct an in-depth social inquiry (Patton, 2002; Ramsden, 2002). Certain indicators of efficiency require the use of quantitative data in the form of financial reports from the LSR-WUA, which will be used in this study.

1.4. The context of the research

Water resources are crucial, not only in ensuring sustainability in social progress and economic development (Sullivan, 2002: 1195), but also in preserving the integrity of other natural environmental resources for the use of future generations (UN-Water, 2008). Furthermore, poverty reduction and livelihood sustainability are dependent on water resources, as water is a vital factor in industrial and agricultural activity (Goldin, 2008). It is for these reasons that countries strive to improve water allocation, access, distributional equity and sustainable management through water policies and other statutory enactments (RSA, 1997; RSA, 1998; RSA, 2000; UNDP, 2004; UN-Water, 2008; Rockstrom *et al.*, 2009; UN-Water, 2012).

Despite the importance water assumes in overall economic and human development, many poor people remain trapped in the poverty cycle, with one of the key factors being poor access to the water resources needed for sustaining their livelihood activities (Moriarty *et al.*, 2004; Haigh *et al.*, 2008). Around 1.1 billion people worldwide do not have access to potable water resources (Moriarty *et al.*, 2004; Haigh *et al.*, 2008). In the context of South

Africa and other developing countries, many areas are faced with a number of constraints that hinder access to potable water (RSA, 1998; Du Toit *et al.*, 2011). These constraints include ever-increasing demands for water resources, fragmented water institutions, diminishing supply of water resources, unfavourable climate changes, and lack of finances for infrastructural development in the water sector, among others (Tucci, 2001; Pollard and Du Toit, 2005; Braga *et al.*, 2008; Fischhendler and Heikkila, 2010; Lorz *et al.*, 2011; Du Toit *et al.*, 2011; Engle *et al.*, 2011). The dynamics of water challenges have been summarised by Saleth and Dinar (2004: 1) as follows:

“Although the nature and severity of water problems are different from country to country, one aspect is common to most countries: water scarcity – whether quantitative, qualitative, or both – originates more from inefficient use and poor management than from any real physical limits on supply augmentation.”

1.4.1. Water issues in South Africa

According to Schulze *et al.* (2005: 84), South Africa has a “high risk climatic environment”. Generally, the country is characterised by seasonal and uneven rainfall patterns (Vetter, 2009). By implication, some parts of the country are more water scarce than other parts. South Africa is classified as a semi-arid country with an average annual rainfall of an estimated 450 mm (Palmer and Ainslie, 2007; South Africa Government Online (SAGO), 2014). Palmer and Ainslie (2007) argue that approximately 70% of land surface in South Africa receives an average annual rainfall varying from less than 200 mm to 600 mm (Table 1.1).

Table 1.1: Climatic classifications and annual average rainfall in South Africa

Rainfall (mm)	Classification	Percentage of land surface
<200	Desert	22.8
201–400	Arid	24.6
401–600	Semi-arid	24.6
601–800	Sub-humid	18.5
801–1 000	Humid	6.7
<1 000	Super-humid	2.8

Source: Schulze 1997; Palmer and Ainslie, 2007

According to SAGO (2014), numerous dams have been constructed in several parts of the country to be used primarily for irrigation since there are no sizeable natural lakes in South Africa. The largest river in South Africa is the Orange River (SAGO, 2014) and two of South Africa's largest dams are situated on the Orange River (DWA, 2013) (Table 1.2).

Table 1.2: South Africa's major dams

Dam	Full supply capacity (10^6 m^3)	River
Gariiep	5341	Orange
Vanderkloof	3171	Orange
Sterkfontein	2616	Nuwejaarspruit
Vaal	2603	Vaal
Pongolapoort	2445	Pongola

Source: DWA, 2013

In 1930, the apartheid government initiated the construction of the Gariiep Dam essentially as a poverty alleviation project for the whites (Department of Rural Development and Land Reform (DRDLR), 2011). It is argued that the apartheid government constructed dams largely as social-relief and development initiatives designed for poor white communities (DRDLR, 2011; Muller, 2012).

In addition to unreliable and unfavourable climatic conditions, acid mine drainage, invasive alien vegetation, uncontrolled fires, climate change, poorly managed land resources and large-scale monocropping are other factors contributing to water scarcity in the country (Schulze and Perks, 2000; Tucci, 2001; Pollard and Du Toit, 2005; Braga *et al.*, 2008; Lorz *et al.*, 2011; Du Toit *et al.*, 2011; Engle *et al.*, 2011; WWF, 2013; NWRS, 2013). The scarcity of water resources in South Africa requires careful management and equitable allocation of water resources in order to contribute to inclusive economic growth (NWRS, 2013). Water allocation faces many challenges at different stages in the distribution channel from catchments to water users, resulting in inequities in its distribution (WWF, 2013; NWRS, 2013).

In South Africa, some of the constraining factors hindering the equitable distribution of water resources currently are a product of the apartheid history of the country (Nash, 2012). During apartheid, the Native Land Act of 1913, which was informed by racial segregation, led to skewed distribution of natural resources (Thompson *et al.*, 2001). The existence of riparian water rights made the apartheid era legislation exclusive and racist as far as access to water was concerned because of the undisputable link between land ownership and access to water (Thompson *et al.*, 2001; Nash, 2012). Thus, inequitable access to water was buttressed by the institution of private property (Thompson *et al.*, 2001; Nash, 2012; Muller, 2012).

The apartheid government, through The Native Land Act among other legislative instruments, had forced the black majority onto less than one quarter of the South African land. Access to and control of land and other natural resources was thus in the hands of the white minority of the population (Schreiner and Naidoo, 2000; MacKay, 2003). Government policies were geared at advancing the needs of the white minority rather than alleviating the position of the poor in the social economy (Earle *et al.*, 2005; Muller, 2012).

It has been noted that wealthy municipalities and towns were able to afford the distribution of potable water supplies and water-borne sewage services to their mostly white residents, while black local authorities could not avail such services to the black population due to inefficient management and lack of funding (Goldin 2005; Earle *et al.*, 2005). According to Cameron (2003), white local authorities had access to separate revenue in the government's accounts, which was significantly greater than the revenue availed to black authorities, while rural areas were usually left to fend for themselves using self-generated finances. Local governments self-generated finances through the delivery of services and collection of taxes (The Green Paper on Local Government, 1997; Cameron, 2003). However, local governments in black communities were barred from developing retail outlets and industries (The Green Paper on Local Government, 1997). This consequently deprived local governments in black communities of the means to accumulate financial resources needed for meeting the local needs. The Green Paper on Local Government (1997: 12) states that,

“Through spatial separation, influx control, and a policy of ‘own management for own areas’, apartheid aimed to limit the extent to which affluent white

municipalities would bear the financial burden of servicing black areas. The Group Areas Act restricted the permanent presence of Africans in urban areas through the pass system, and reserved a viable municipal revenue base for white areas by preventing townships from attracting industry.”

In the post-apartheid era, the South African water legislative framework has been reformed. The 1956 Water Act, which had the provision of the economic growth of South Africa as its core mandate without specific regard for the environment and/or social equity issues, was replaced by the enactment of the Water Services Act (WSA) of 1997 and National Water Act (NWA) of 1998. Both of these pieces of legislation call for participation of all stakeholders in the water sector as well as for equitable distribution of water resources for the benefit of all. Section 3(1) of the Water Services Act of 1997 states that “everyone has a right of access to basic water supply and basic sanitation”, wherein ‘basic water supply’ is understood as the “prescribed minimum standard of water supply services necessary for the reliable supply of a sufficient quantity and quality of water to households, including informal households, to support life and personal hygiene”.

The Water Services Act of 1997 and National Water Act of 1998 are based on three important themes, namely; equity, sustainability and efficiency. These legislative tools have enabled the government to make progressive changes as far as potable water access and access to water services are concerned (Muller *et al.*, 2005; Kuusi, 2009; Wegelin and Jacobs, 2013).

Despite their aims of achieving equitable distribution and sustainable use of water resources for the betterment of living standards for all, the NWA and the WSA are yet to deliver to the best of their potential in order to improve the country’s social and economic state. The allocation of water resources is skewed, with a bias against many poor communities. According to Muller *et al.* (2005: 5), the water resources and services in “well-off urban communities” are usually of a high standard compared to those in poor communities, where people go without water for days at a time.

In South Africa, municipalities are largely self-financing (RSA, 1998; Kuusi, 2012). However, it is argued that some municipalities do not have sufficient human, technical and financial resources to promote water conservation and demand management, resulting in limited access to water resources in some communities in South Africa (Muller *et al.*, 2005, Kuusi, 2009; Wegelin and Jacobs, 2013). Kuusi (2009: 2) argues that

“[T]here are differences in the ability of the richer and poorer municipalities to generate revenue. The legislation provides that the municipalities are entitled to resources commensurate to their responsibilities, but in many service sectors this is not realised in practice as poverty is pervasive especially in the rural areas.”

In the 2010 State of the Nation Address, the president of the Republic of South Africa noted that “We are not a water rich country. Yet we still lose a lot of water through leaking pipes and inadequate infrastructure.” According to a study conducted by the Water Research Commission (WRC) in 2013, water losses are one of the main factors impeding efficient allocation of water resources. The agricultural sector uses up to 60% of the country's water resources for irrigation. However, of the 60%, the water losses in the sector account for an average of between 35% and 45% (WRC, 2013).

Some municipalities in South Africa do not have effective institutional capabilities, and hence they are often faced with a number of challenges, which lead to a failure to embrace IWRM fully and provide water resources to the best of their capacity (Saravanan *et al.*, 2009; Clifford-Holmes *et al.*, 2012). Such challenges include lack of funds to ensure uninterrupted water supply through to expansion the storage facilities. Lack of appropriate governance arrangements are often the root cause of various institutional deficiencies that result in poor service delivery, ineffective and inefficient resource allocation, poor revenue collection and poor resource mobility (Nallathiga, 2009).

1.4.2. A brief introduction to the Lower Sundays River Valley (LSRV) and the Sundays River Valley Municipality (SRVM) case study

The Sundays River Valley Municipality (SRVM) is one of nine local municipalities in the Cacadu District, Eastern Cape, South Africa (Figure 1.1). It is located at an area characterised

by wide, fertile flood plains, with its annual rainfall ranging between 250 – 500 mm (SRVM, 2011). There are 54 500 people living in 14 700 households in the SRVM (Statistics South Africa, 2012). The economic growth and literacy rates in the SRVM are 3.5% and 55.5% respectively (SRVM, 2011).

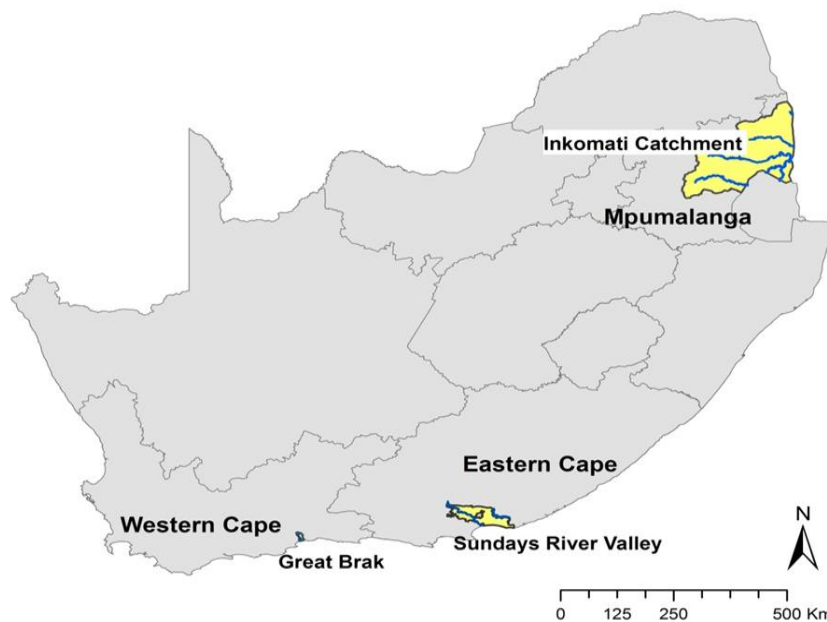


Figure 1.1: Location of the SRVM in South Africa (Source: Clifford-Holmes, 2013)

The SRVM prides itself on its ecotourism and agricultural potential. There is a strong irrigation-based economic activity in the catchment as citrus production forms the main economic driver in the SRVM. About 48% of employment in the SRVM is provided by agricultural activities in the area (SRVM, 2011: 30).

Despite the existence of the thriving citrus industry in the area, around 60% of people in the SRVM live below the poverty datum line (SRVM, 2011: 16). The inequality between the municipal populace and the commercial citrus industry is noticeable with regards to water redistribution in the Lower Sundays River Valley (LSRV). Commercial farmers get the largest amount of over 90% of water resources allocated by the LRV-WUA, while the SRVM accounts for less than 4% of the LSV-WUA’s allocation (Clifford-Holmes *et al.*, 2012).

One of the contributory factors to such a discrepancy is fragmented water institutions (Fischhendler and Heikkila, 2010; Lorz *et al.*, 2011; Du Toit *et al.*, 2011). These institutions are the LRS-WUA, which acts as the bulk water supplier, and the SRVM which acts as both

the water services authority (WSA) and the water service provider (WSP) for the areas within its boundaries. The institutions are faced with a number of challenges such as lack of clarity in respect of institutional arrangements and provisions, which can lead to a failure to provide water resources effectively (Saravanan *et al.*, 2009; Clifford-Holmes *et al.*, 2012).

1.5. A preview of chapters

The thesis is divided into eight chapters. The first three chapters provide an overview of the theoretical foundations within which the analysis of the study is generated. Chapter two discusses New Institutional Economics and its general influence on natural resource management. Over the years, the need to develop paradigms for evaluating problems of resource mismanagement, misallocation and scarcity prompted the shift from the neoclassical economics approach to establishing the influence of institutions, human choices and incentives in natural resource management.

Chapter three presents a discussion of international water policies and legislations and argues that, in most countries, such policies are aligned to the macroeconomic objectives of the country in question. The chapter further reflects on the concept of water as an economic good, expanding on the complexity concept of water. It then gives an overview of water management institutions in both pre- and post-apartheid South Africa.

Chapter four analyses South Africa's post-apartheid water policy and legislation in terms of community participation, property rights, transaction costs and other themes related to NIE. The chapter further traces the influence of neoclassical economics principles in policy formulation. The levels of economic institutions framework is used to illustrate the interdependencies and interconnectedness of institutions operating at various levels.

Chapter five discusses WUAs institutions for managing common pool resources. Common pool resources are often prone to overconsumption and consequently 'tragedy of the commons' (Meinzen-Dick, 2007; Orne-Gliemann, 2008). In some countries, WUAs are established to curtail the challenges of centralised systems, while in others they serve as key

institutions needed for promoting a more inclusive water allocation channel designed to provide sustainable livelihoods (Subramanian *et al.*, 1997; Pegram and Mazibuko, 2003; Perret, 2006; Wilson and Perret, 2010). The chapter summarises the challenges faced by WUAs in South Africa and other countries using NIE theories of common pool resource management.

Chapter six outlines a thorough description of research methods and paradigms used to address the research goal and questions of this study. The justification and rationale for selecting such methods and methodologies is provided in the chapter.

A comprehensive analysis of the LSR-WUA's governance and performance indicators is provided in chapter eight. In the chapter, the influence of historical path dependence on the current operations of the Association is traced and discussed. The chapter argues that the absence of institutional arrangements, such as service contracts, between the LSR-WUA and the SRVM consequently creates operational vacuums and water supply disruptions in the LSRV catchment area.

Chapter eight concludes and provides a detailed summary of major findings and implications for national policy and national level water institutions.

CHAPTER TWO

THE INSTITUTIONS APPROACH TO NATURAL RESOURCE MANAGEMENT

2.1. Background: Towards institutions

Economic theorists and other scholars of various disciplines have, over the years, given increasing attention, not only to understanding the position of institutions in the economic systems' web (Saleth and Dinar, 2004; Rossiaud and Locatelli, 2010). They have focused on developing paradigms necessary for evaluating problems of resource mismanagement, misallocation and scarcity from an institutional perspective (Drobak and Nye, 1997; Smith, 1998; Saleth and Dinar, 2004; Rossiaud and Locatelli, 2010). This interest has been encouraged by, among other factors, the fact that economists have come to appreciate that the discipline does not fully define and describe how various factors relate to one another in a complex interconnected system. Hence, it has failed to satisfy the effectiveness in policy implementation (Furubotn and Richter, 1991; Saleth and Dinar, 2004; Evensky, 2004). This argument finds support in Matthew's (1986: 903) work, wherein Marshall was quoted as follows, "The chief fault in English economists at the beginning of the [nineteenth] century was...that they did not see how liable to change are the habits and institutions of industry." In his article titled "The New Institutional Economics: Taking Stock, Looking Ahead", Williamson (2000: 595) made the following reflection:

"I open my discussion of the new institutional economics with a confession, an assertion, and a recommendation. The confession is that we are still very ignorant about institutions. The assertion is that the past quarter century has witnessed enormous progress in the study of institutions. The recommendation is that, awaiting a unified theory, we should be accepting of pluralism."

A wide variety of literature has since emerged, with its primary interest being establishing how factors such as property rights, community participation and transaction costs affect economic development, human behaviour and incentives in any given economy (Furubotn and Richter, 1991; Macher and Richman, 2006). The literature has found the influence of

Institutional Economics in other fields of economics such as Environmental, Natural Resource and Ecological Economics to be more apparent over the years.

2.2. The essence of Institutional Economics

It has been observed that Institutional economics has become one of the most interesting and liveliest areas in economics (Matthews, 1986; Chang, 2010), and this is because this field of economics has turned on two propositions: first, “institutions do matter”; and second, “the determinants of institutions are susceptible to analysis by the tools of economic theory” (Matthews, 1986: 903). Institutional economics seeks to demonstrate how institutions influence public choice and human behaviour. According to North (2003), “institutions are incentive systems, that’s all they are. It is important to understand that because being incentive systems, they provide a guide to human behaviour.” Institutional economics is hence the field of economics that uses a wide range of literature from other fields of study such as law, sociology, ecology, socio-biology and many others in an effort to establish the role played by institutions in defining the direction of economic development and behaviour (Brousseau and Glachant, 2008). This field of economics seeks to demonstrate how formal and informal institutions such as contracts, property rights, firms and other social arrangements may lead to positive economic growth and a reduction in transaction costs (Williamson, 1997).

There is much interesting scholarly literature about the “old” and “new” institutional economics (Rutherford, 1994 and 1995; Nee, 2003; Rossiaud and Locatelli, 2010). The point of intersection of these two approaches is that they both relax some of the assumptions adopted in neoclassical economics analysis. Some of the proposed assumptions used in the neoclassical economics approach are: the availability of perfect information for all economic agents, zero transaction costs, rationality in human behaviour and markets being viewed as the only mechanism of allocation, and hence ignoring the role of institutions in the economic system (Poel, 2005).

New institutional economists argue that factors such as, the opportunistic behaviour of agents, transaction costs that are greater than zero, information asymmetry and property rights, should be infused into economic analysis as they could affect the conclusions of the study (Rossiaud and Locatelli, 2010). These economists view institutions as key structures necessary for moulding the behaviour of economic agents in the real world of imperfect information (Ferrari-Filho and Conceição, 2005).

The main emphasis of the new institutional economics is to illustrate the role played by transaction costs and information in influencing human and economic behaviour (Williamson, 1997). The core distinction between the “Old Institutional economics” (OIE) and the “New Institutional economics” is that the “old” fails to embrace the concept of self-interest, thereby earning itself a label of “anti-theoretical” (Castle, 1999: 297). Rationality and the self-interest hypothesis from the neoclassical economics framework are applied in the public choice field as well as in NIE, while the OIE tends to reject the majority of the propositions of neoclassical economics including that of rational economic actors (Castle, 1999; North, 1990, 1991; Rutherford, 1995 and 2001).

Rutherford (1995 and 2001) argues that while the Old Institutional economists abandoned the assumption of unbounded rationality of economic actors, NIE scholars, on the other hand, extended and modified the assumption instead of abandoning it. This shortcoming ultimately led to the failure of the OIE in its bid to shape the direction of modern economics (Nee, 2003). According to Coase (1984: 230), the OIE produced a “mass of descriptive material waiting for a theory, or a fire.” In line with this argument, Williamson (2000: 596) quotes Kenneth Arrow as follows:

“Why did the older institutionalist school fail so miserably, though it contained such able analysts as Thorstein Veblen, J. R. Commons, and W. C. Mitchell? I now think that . . . [one of the answers is in the] important specific analyses . . . of the New Institutional Economics movement. But it does not consist of giving new answers to the traditional questions of economics-resource allocation and the degree of utilization. Rather, it consists of answering new questions, why economic institutions emerged the way they did and not otherwise; it merges into economic history, but brings sharper [micro-analytic] . . . reasoning to bear than had been customary.”

Figure 2.1 shows a causal model hypothesised by NIE adapted from Williamson (1995: 213) and Nee (2003: 4). According to the model, the main drivers of the institutional environment are the rules of the game (North, 1981; Williamson, 1995; Nee, 2003). “Institutional environment” in Figure 2.1 refers to a set of core principles that govern the production, exchange and distribution processes in the economy (Davis and North, 1971; Williamson, 1995). The shift parameters of the institutional environment include conventions, contract laws, property rights, norms and customs (Williamson, 1995; Nee, 2003; Menard and Saleth, 2011).

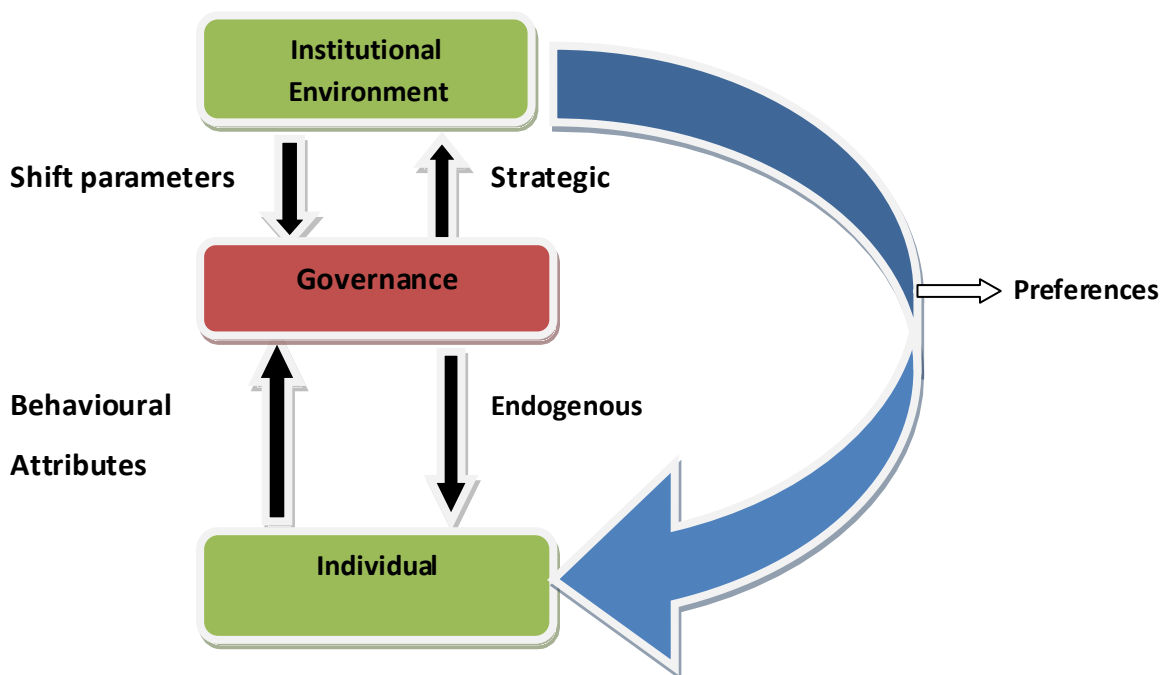


Figure 2.1: A causal model hypothesised by the new institutional economics (Source: Williamson (1995) and Nee (2003))

Changes in governance structures are prompted by changes in parameters of the institutional environment, represented by the downward arrow in Figure 2.1. These changes are a result of the interaction processes of a number of factors that are both exogenous and endogenous to, for example, the water sector. For instance, if there are changes in social norms, legal directives and property rights, relative prices for firms will change, and this will likely lead to changes in the governance structures of the firms (Nee, 2003; Menard and Saleth, 2011). In summary, “the model includes a purposive actor whose behavioural

attributes—“self-interest seeking with guile”—lie behind many of the transaction costs governance structures are designed to address” (Nee, 2003: 5).

2.3. The ideas of institutional economics in relation to environmental and natural resource economics

The emergence of a large range of academic work on multidisciplinary research regarding environmental and natural resource management issues such as environmental policies, natural resource scarcity and resource conflicts has increasingly diverted the focus of environmental economists from the neoclassical approach (Leach *et al.*, 1999; Deacon and Mueller, 2006; Hackett, 2011). Scholars now seek clarity on how institutions influence public choice, transaction costs and human behaviour from an institutional economics point of view (Leach *et al.*, 1999; Deacon and Mueller, 2006). Common pool resources (CPR), such as water resources, are often prone to overconsumption and a problem referred to as ‘tragedy of the commons’ (Ostrom, 1990; Hackett, 2011). Economists define the ‘tragedy of the commons’ as depletion of a shared resource by rational individuals with full knowledge that overuse of the resource is against long-term interest of the group (Hardin, 1968: 1244).

Neoclassical economists have recommended that the assigning of private property rights is one of the essential remedies for ‘tragedy of the commons’ (Hackett, 2011: 100). Institutional economists extend this argument by arguing that institutions have to define the physical restrictions to CPR, and such restrictions should specify the method of financing the system, how the system should be monitored, how conflicts will be resolved and so forth (Ostrom, 1990; Bromley, 1992; Hackett, 2011). Furthermore, it is argued that there should be “local self-governance” (Sethi and Somanathan, 1996: 767), whereby the management of CPR is led by local communities. According to Ostrom (1990) and Hackett (2011), local self-governance requires limited or no political interference in the operations of CPR institutions. The consensus emerging from the Neoclassical economics and NIE approaches is that, in the absence of restrictions on common pool resource use, the users are more likely to excessively extract and exploit the resource, leading to undesirable outcomes such as overexploitation and ultimately depletion (Wade, 1988; Ostrom, 1990; Baland and Platteau, 1996; Bandaragoda, 2000; Agrawal, 2001; Libecap, 2008). The constraints should take into

account social costs and benefits of resource use to allow for broader and more inclusive net benefit (Agrawal, 2005; Libecap, 2008). This argument is supported by Libecap (2008: 545), “Without some limits on individual behaviour to better reflect broader, social benefits and costs, only private net benefit calculations govern resource use decisions”.

Efficient economic and resource management forms the foundation of NIE (Gardner *et al.*, 1994; Brousseau and Glachant, 2002; Lieberherr, 2009). According to NIE scholars, the discipline is centred on the need to align various imperfect institutional and contractual arrangements in order to determine the most suitable way to offset conflict and maximise the benefits of resource use with the least transactions cost (Gardner *et al.*, 1994; Brousseau and Glachant, 2002; Lieberherr, 2009). New institutionalism hence argues that the institutional environment should lay a foundation that enables the attainment of efficiency in institutional arrangements through the provision of structures that allow for collaboration and cooperation (Brousseau and Glachant, 2002; Ostrom, 2005; Menard and Shirley, 2005; Kirsten *et al.*, 2009).

However, a major criticism levelled against the NIE is that, although efficiency forms the core idea of this branch of economics, the institutional efficiency context varies depending on the case in question (Platteau, 2008; Lieberherr, 2009). For instance, while water privatisation may function competently and effectively in a developed country due to factors such as transparency and accountability of relevant government annexes, it may fail in a less developed country due to corruption, lack of regulation and other factors (Lieberherr, 2009). Kirsten *et al.*, (2009) argue that institutional inefficiencies have led to the inability of societies to progress effectively, and to develop low-cost enforcement of contracts, which has consequently led to both historical stagnation and current underdevelopment in the third world.

Several ideas proposed by NIE have enabled institutional economics to increase its applicability to a wide range of disciplines such as environmental and natural resource economics. This has in turn led to the formulation of recommendations that are in line with economic and sociological needs of communities and individuals in developing countries (Williamson, 1995; Evensky, 2004; Deacon and Mueller, 2006; Thiel *et al.*, 2012). Such

recommendations take into account local norms and customs. Examples include the call for policy reforms in the water sector that acknowledge social norms, community participation, as well as the general relationships of residents and the environment (Thiel *et al.*, 2012; Sharma, 2012).

2.3.1. Property rights to natural resources

Property rights are broadly defined as “all laws, rules, social customs, and organisations that generate incentives for human action” (Marinescu, 2012: 256). Alternatively, property rights can be defined as social customs that define the range of privileges granted to individuals of specific natural resources (Mahoney, 2004). The main importance of property rights is to give the owner the right to exclude others from use of the resource and/or asset. Where the owner chooses to render conditional use of the asset, property rights give the owner the right to appropriate rents from the asset. They also allow the owner of the asset exclusive right of sale of the asset (Tregarthen and Rittenberg, 2000). Property rights could be enforced by formal arrangements as specified in statutes, national constitutions and international treaties, as well as through judicial rulings. They could also be enforced through informal arrangements, which include traditional values and customs in a given society (Deacon and Mueller, 2006).

Neoclassical economics theory posits that, where property rights are enforced, there is optimal allocation of resources resulting from the price and demand of the resources (Williamson 1994; Saleth and Dinar, 2004; Hodgson, 2009). This implies that assigning property rights leads to efficient allocation of resources. Equally, if the resources are allocated under private ownership and all the price misrepresentations are eliminated, then such resources will be allocated optimally. Economists argue that a resource allocation Pareto optimal or efficient if it is impossible to make one member of society better off without making some other member or members worse off (Reinhardt, 2001). Generally, Pareto optimality is viewed as a necessary but not sufficient condition for attaining maximum social welfare (Reinhardt, 2001). The view of Pareto optimal allocation of resources in the absence of price misinterpretation has been criticised by proponents of NIE

as being too abstract, where allocations of resources based on property rights may not be “optimal” due to the presence of competing agents in the economy, and the ability of agents to make mistakes (Ollila, 2009).

The importance of creating well-defined property rights when there are changes in relative scarcity of the natural resource can never be underestimated (North, 1990). Such changes include population growth, the rate of technological advancement and changes in taste and preference of economic agents, which often lead to shifts in the demand for the natural resource (Deacon and Mueller, 2006).

Over the years, increased attention has been directed towards establishing the nature of the relationship between property rights enforcement and incentives (Libecap, 1989; Alston and Mueller, 2003; Thiel *et al.*, 2012). The manner in which property rights are imposed often determines the reception and the success of the mandates of such rights in communities. Adoption of a “one-size-fits-all” approach by governments in the imposition of property rights on a large number of communities occupying different areas with varied ecological, geological and sociological features, often leads to adverse impacts on the conditions of natural resources (Ostrom, 2004). From this point of view, it is argued that the success of achieving allocation efficiency of communal resources is dependent on respecting traditional agreements that communities have in place instead of disregarding the existence of indigenous property rights (Ostrom, 2004). A proper understanding of the nature and functioning of local structures serves as a strong foundation for predicting the incentive shifts and responses to property rights enforced by the government (Heltberg, 2002).

Property rights play a fundamental role in maintaining sustainable exploitation of natural resources in order to protect sources of livelihoods for people. According to Chambers and Conway (1991: i),

“A livelihood comprises the capabilities, assets (including both material and social resources) and activities required for a means of living. A livelihood is sustainable when it can cope with and recover from stress and shocks and maintain or enhance its capabilities and assets both now and in the future, while not undermining the natural resource base.”

Sustainable livelihoods translate into a reduction of rural poverty, improvement in food security and decline in rural-urban migration (Heltberg, 2002). Livelihood activities of low-income earners in rural communities of developing countries are directly dependent on natural resources such as land for farming, water for fishing and irrigation, animals and plants (Heltberg, 2002). Another crucial role played by property rights is that they could be designed in a way that could increase allocational efficiency when sources of market failure, such as externalities and public goods, are in existence (Deacon and Mueller, 2006). Furthermore, property rights are needed for defining the nature of resources that are exploitable, the timeframe for exploiting such resources, the individuals and/or organisations that have exclusive permission to exploiting such natural resources and the maximum amounts exploitable in a given period of time (Stroup and Baden, 1979; Deacon and Mueller, 2006).

2.3.2. Transaction costs, inter-dependence and natural resource management

NIE argues that economic agents are faced with positive transaction costs (North, 1997; Challen, 2000; Saleth and Dinar, 2004). Coase (1988: 15) posits that, because it assumes a world of zero transaction cost, neoclassical economics “is incapable of handling many of the problems to which it purports to give answers”. This argument is in line with another propounded in his earlier work, wherein Coase (1960: 15) highlighted that the processes of carrying out a market transaction entail positive transaction costs, and such costs would need to be allowed for in any policy implementation.

Institutions are viewed as cost-minimising and interdependent arrangements that form part of the complex economic system. According to Ollila (2009), economic agents either have divergent or convergent interests with respect to scarce resources, and hence they are interdependent. They have relationships through the natural resource base they depend on, and through institutions that govern their actions. By virtue of being interdependent, the choice of one economic agent has a direct influence on that of another agent (Paavola and Adger, 2002).

New institutional economists argue that individuals on their own cannot appreciate how conflicting their interests are towards a specified scarce environmental and/or natural resource (North, 1997; Challen, 2000; Paavola and Adger, 2002). Therefore, there is a need to define environmental management guidelines as well as to define private property rights, a concept known as the Coase Theorem (Paavola and Adger, 2002). Such an exercise normally entails incurring transaction costs. The Coasian viewpoint is that property rights are essential for affirming the ultimate control over resources since transaction costs associated with the resources may often inhibit 'efficiency-enhancing' reallocations (Cole and Grossman, 2002: 321). Environmental governance is also influenced by factors such as the nature and use of environmental resources, as well as the nature of arrangements in place to direct the use of such a resource (Paavola and Adger, 2002).

2.3.3. Collective action and natural resource management

Cooperative governance or collective action is defined as the "willingness to pool resources, offsets the costs of control and increases efficiency through a cooperative atmosphere by, for example, increasing the sense of responsibility among human actors in a firm" (Lieberherr, 2009: 13). It is argued that collective groups, such as WUAs, can process and use information more effectively and efficiently than a centralised system as they generate customs and social conventions that fit their needs in an effort to maximise efficient resource use (Brousseau and Glachant, 2002; Menard and Shirley, 2005; Kirsten *et al.*, 2009; Lieberherr, 2009).

Ostrom (2009) states that cooperative governance at local level often manages to resolve conflicts and curb free-rider problems through shared learning, social norms and preferences, trust, as well as reciprocity of trust. Collective action has been established as one of the preferable avenues of managing common pool resources (Duncan, 2003). Some communities have, for centuries, enjoyed the positive results of collective action through their traditional or indigenous methods (Ostrom, 2004). Such arrangements need to be considered when making public policies, especially those related to agriculture, natural resources and institutional development (Duncan, 2003).

Proponents of collective action argue that individuals often do not possess perfect information, as per the assumptions of neoclassical economics, but they are capable of absorbing knowledge through interaction in a particular setting (Cox *et al.*, 2010; Ostrom, 2011). This serves as an effective path for achieving sustainable development, equitable distribution and allocation of public goods as well as internalising ecological externalities such as pollution (Adhikari, 2002). According to Ostrom (2004), communication and proper involvement of institutions that are concerned could help policymakers achieve desirable results from collective action.

Despite the positive results of collective action in natural resource use, this approach has its weak points. One of the main issues related to common property resource management is that this method works best where only a few agents are dependent on the natural resource as it is easier to monitor each other's conduct (Ostrom, 2004). This argument is supported by Reuben (2003) wherein he argues that, in many instances, agents often fail to cooperate and systematically group themselves despite the noticeable advantages of doing so. Opponents of collective action cite problems associated with financing collective action, the risks of free-riding, as well as the risks of facing law suits due to irresponsible behaviours of representative bodies as some of the disadvantages of collective action (Van den Bergh and Visscher, 2007).

Furthermore, it is argued that cooperative governance often entails bureaucratic costs, that is, transaction costs (Menard and Shirley, 2005). Furthermore, some NIE scholars argue that cooperative governance is inefficient in reacting promptly to shocks and accumulating capital due to complexities associated with managing incentives of individuals with divergent and varying interests (Menard and Shirley, 2005; Brousseau and Glachant, 2008). Nonetheless, other scholars argue that cooperative governance creates *ex post* commonalities and harmonies, which are necessary for conflict resolutions as well as curbing rent-seeking behaviour of economic agents (Dosi and Marengo 1994; Teece *et al.*, 1994; Poppo and Zenger, 2002; Brousseau and Glachant, 2008).

Ostrom (2009 and 2011) uses game theory and Institutional Analysis and Development (IAD) to illustrate how attributes of the community, such as trust and social capital, and

information sharing between agents through various interactions interrelate in order to bring desirable outcomes for CPR management within a cooperative governance setup. In Figure 2.2, action situations are understood as the social spaces within which agents or stakeholders “interact, exchange goods and services, solve problems, dominate one another and fight” (Ostrom 2011: 11).

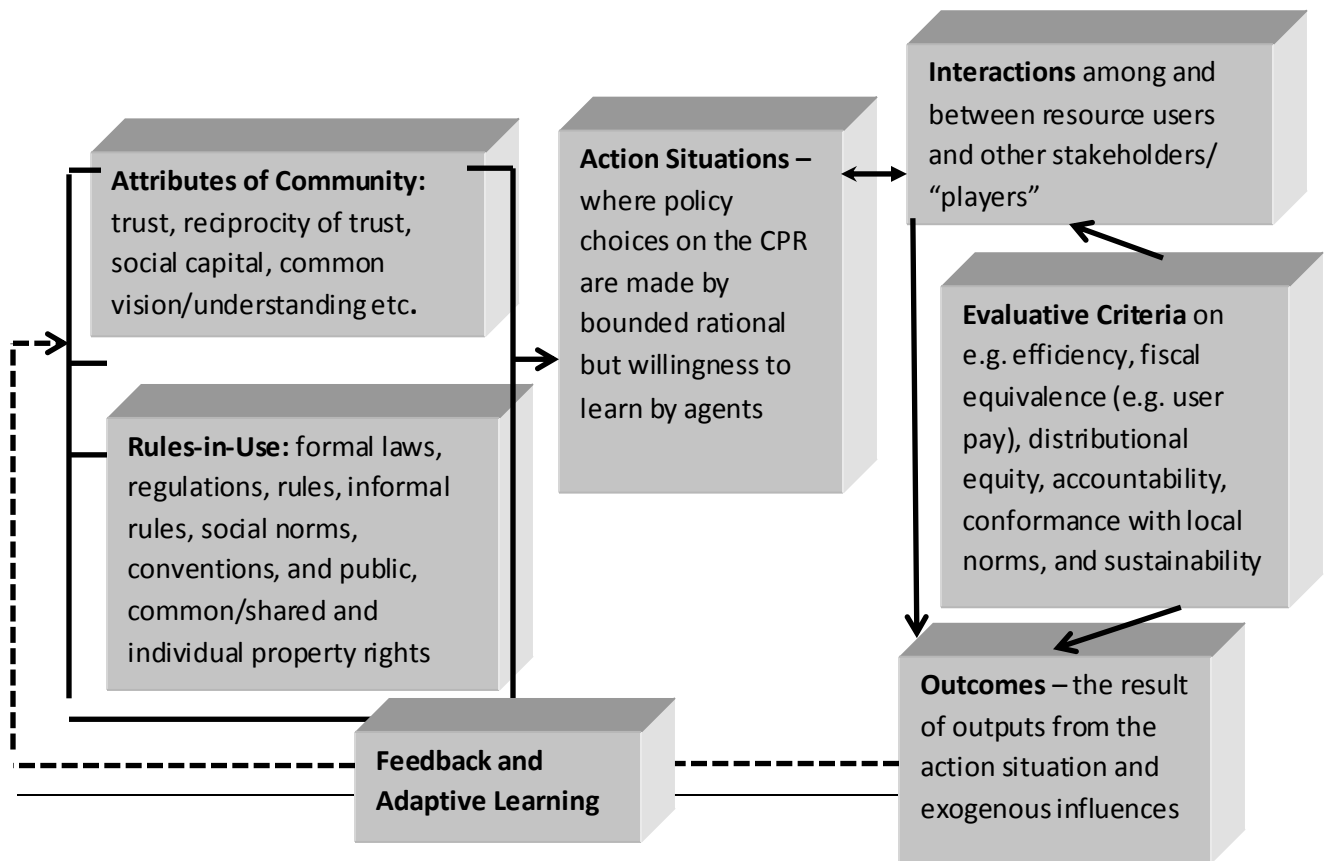


Figure 2.2: Institutional Analysis and Development (IAD) Framework. (Source: Ostrom, 2009)

2.3.4. Political economy and natural resource management

There seems to be a consensus between neoclassical economists and new institutional economists that there are several links between political systems and natural resource use by agents in the economy (Hackett, 1998; Adger *et al.*, 2006; Collier, 2010). For instance, if the laws in any given jurisdiction clearly state the ownership details of, and claims from, the natural resource, then the element of uncertainty and ambiguity is eliminated. On the other hand, instability of the country’s political environment and ambiguity in the ownership claims of the natural resource often lead to uncertainty on future returns to be accrued from the resource, increases disincentive of conserving the resource, and consequently lead

to depletion and over-exploitation of the natural resource in question (Sanderson, 1994; Adhikari, 2002; Collier, 2010).

Both schools of thought concur that an important role played by a stable economic system in environmental conservation is providing the poor with an equal opportunity of having access to resources and claiming accountability and responsibility towards such resources and the environment at large (Duncan, 2003). Sustained economic growth, unbiased redistribution of natural resources and national wealth, and reduction of rural poverty are dependent on economic stability (Duncan, 2003; Collier, 2010). Partisan government policies, such as marginalising the agriculture sector and neglecting rural infrastructure, have been identified as chief contributors to both rural and urban poverty (Duncan, 2003; Collier, 2010).

2.4. The importance of contracts

Contracts are used as one of the essential analytical tools by new institutional economists (Coase, 1937; Williamson, 1975 and 1991; North; 1990; Brousseau, 2008). In his paper entitled “The Nature of the Firm” Coase analyses the firm’s contractual agreements. Williamson extends the work by analysing governance and transaction costs’ relationships to contracts (Williamson, 1991). As analytical tools, contracts are used to analyse transactions between entities as well as their relationships (Brousseau, 2008). They are used as a way of mitigating transactional hazards and improving the quality of services exchanged by the parties (Brousseau, 2008; Mihau *et al.*, 2008).

Brousseau (2008) used contracts to examine the degrees of cooperation, coordination and organisational interactions between entities. The argument made by NIE scholars is that contracts dictate the actions of the agents (North; 1990; Brousseau, 2008). However, according to Brousseau (2008), the success or failure of contractual agreements depends largely on the nature of the institutional environment within which they have been endorsed. For this reason, it is argued that contracts are “embedded in an institutional framework” (Brousseau, 2008: 38). The enforcement of contracts is thus constrained by the existing institutional environment.

While NIE refers to contracts as one of the fundamental points of analysis, the scholars of this discipline have acknowledged that contracts entail transaction costs (Coase, 1937; North; 1990; Weingast, 2007; Brousseau, 2008). The costs of managing and designing contracts lead to an increase in the overall costs endured by the agents (Weingast, 2007; Brousseau, 2008). Moreover, adjusting contracts to suit the interests of both parties might be both a lengthy and time-consuming process (North; 1990; Weingast, 2007; Brousseau, 2008).

Nonetheless, contracts that are flexible and, adjusted to harmonise the diverse interests of the parties involved, create an incentive for service delivery, profit maximisation and relationship building (North; 1990; Williamson, 1998; Weingast, 2007). This is realised when the hazards of opportunism have been factored in during the drafting process of the contract (Williamson, 1998).

The overall benefits of establishing contractual agreements, especially between water and other basic needs institutions, are argued to outweigh the costs (Milgrom and Roberts, 1992; Weingast, 2007). It is argued that contracts present a deterrent effect necessary for balancing the scale for profit maximisation and social inclusion, and for governing the actions of the agents towards greater social equity (Milgrom and Roberts, 1992; Weingast, 2007). Even though the LSR-WUA is not a profit maximisation company, it is important to appreciate that the Association exists as a result of the transformed structure of irrigators who share hydraulic infrastructure and associated complex administrative and financial systems (LSR-WUA, 2011). Financial sustainability is hence one of the obligations of the LSR-WUA to its stakeholders (LSR-WUA, 2009, 2010 and 2011).

Scholars of NIE recognise that for institutions to function effectively, there needs to be institutional support in the form of well-defined property rights and contractual agreements (Greif, 2005; Menard and Shirley, 2005; Lieberherr, 2009). Neoclassical economists, on the other hand, argue that price mechanisms can lead to efficiency and effectiveness even when the administrative control of institutions is “hands-off” (Lieberherr, 2009: 9). It is argued that, according to neoclassical economics theory, the existence of the legal system is

necessary for the attainment of efficiency and mutually beneficial exchanges in the economy (Greif, 1996 and 2005; Menard and Shirley, 2005; Lieberherr, 2009).

2.5. Path Dependency and Cooperative Institutional Governance

The concept of 'path dependency' is used to describe the adaptation of historical experiences, behaviours and/or identities that once proved to be effective and efficient in new tasks and challenges (Lowndes, 2005; Streeck and Thelen, 2005; Heinmiller, 2009). Neoclassical economists use the concept of increasing returns to describe path dependency (Pierson, 2000; Sehring, 2009). Their argument is that path dependency takes place when the cost of alternative behaviour increases while the benefits derived from staying on the path increase (Pierson, 2000; Sehring, 2009). Some scholars of neoclassical economics have upheld the argument that understanding institutional change is dependent on the past, present and future events (David, 1994; Lowndes, 2005; Streeck and Thelen, 2005; Heinmiller, 2009). David (1994: 207) states that

“Institutional arrangements were plastic and, therefore, could and would be readily adapted to achieve efficiency wherever people saw that doing so would be to their economic advantage”

To a certain extent, the views of neoclassical and new institutional economists about institutions being the carriers of history converge (David, 1994; Lowndes, 2005; Streeck and Thelen, 2005; Heinmiller, 2009; Sehring, 2009). For instance, the implicit assumption made by new institutional economists that institutional arrangements are “perfectly malleable” (David, 1994: 207) is heavily aligned to neoclassical economics assumptions. Moreover, both schools of thought seem to propose that,

“The longer an institution exists, the greater are the investments and adaptations in the institution, and the more difficult it is to undertake major institutional change” (Heinmiller, 2009: 135).

As argued by new institutional economists, initiating major institutional changes often results in high transaction costs (North, 1990; Heinmiller, 2009). Major institutional changes may also result in reluctance of stakeholders to abandon their investment in existing

institutions (North, 1990; Heinmiller, 2009). According to NIE scholars, institutions strive towards efficiency through minimising transaction costs and the use of macro-institutional arrangements such as property rights (David, 1994; Pierson, 2000; Sehring, 2009). These strategies may make institutions dependent on tried and tested ways of attaining efficiency (Heinmiller, 2009; Sehring, 2009). Furthermore, path dependency is inevitable where actors invested their resources in an effort to shape the direction of the institutions towards greater profitability (Heinmiller, 2009). Power relations hence play a crucial role in shaping and influencing the actions of cooperative institutions (Streeck and Thelen, 2005; Sehring, 2009; Brown, 2013).

It is argued that path dependency usually results in power asymmetries because of embedded personal economic interests that have to be satisfied simultaneously with performing the constitutional functions of the institutions (Streeck and Thelen, 2005; Sehring, 2009). Often, reform policies are too quick to propose the establishment of new institutions, without paying regard to deinstitutionalising old institutions in a way that allows them to be complemented, as opposed to being replaced, by new ones (Lowndes, 2005; Sehring, 2009).

2.6. Institutional governance: Performance indicators and concepts

The debates over the nature of institutional arrangements that should account for effective, equitable, efficient and sustainable management of common pool resources have undergone a remarkable shift over the past three decades (Ostrom, 1990; North, 1990; Bandaragoda, 2000; Libecap, 2008; Brousseau and Glachant, 2008; Kirsten *et al.*, 2009). The shift has occurred in part as a response to emergence of new academic ideas of non-cooperative game theory (Agrawal, 2001), and partly as a result of development and expansion of the body of literature on new institutionalism and common pool resources (North, 1990; Ostrom, 1990 and 2005; Agrawal, 2001; Brousseau and Glachant, 2008).

The use of game theory in analysing the behaviours of agents in markets as prominent institutions can be traced as far back as Adam Smith if not beyond (Agrawal, 2001; Aoki,

2001). In his writing entitled “The Theory of Moral Sentiments”, Adam Smith (1759: 234) notes that

“[I]n the great chessboard of human society, every single piece has a principle of motion of its own, altogether different from that which the legislature might choose to impress upon it. If those two principles coincide and act in the same direction, the game of human society will go on easily and harmoniously, and is very likely to be happy and successful. If they are opposite or different, the game will go on miserably, and the society must be at all times in the highest degree of disorder.”

The classic “Prisoners’ Dilemma” concept of game theory is said to have had a major influence in the collective action argument coined by new institutional economists (Robin and Staropoli, 2008; Brousseau and Glachant, 2008). The prisoner’s dilemma is a concept of game theory that is often used for analysing collective action and social relationships (Penard, 2008).

Acknowledging the effects of institutions in the general performance of the economy has necessitated NIE to use game theory to explain various institutional arrangements and phases using equilibria (North, 1990; Aoki, 2001; Brousseau and Glachant, 2008). Furthermore, conceptualising an institution as an “equilibrium outcome of a game” (Aoki, 2001: 2) directly allows for the investigation of institutions using equilibrium phenomena (North, 1990; Aoki, 2001; Brousseau and Glachant, 2008). There is significant body of NIE literature analysing the risks of opportunism from contractual agreements, collective actions and other institutional arrangements, using both cooperative and non-cooperative game theory (Greif, 1989, 1994, 1997, 1998 and 2000; Coleman, 1987 and 1990; Kandori, 1992; Weingast, 1994; Aoki, 2001; Brousseau and Glachant, 2008). Aoki (2001) illustrates how the formation of WUAs could lead to the elimination of free-rider problem in the management and use of a common-pool resource using game theory. It is argued that there is “the possibility of a strong collectively imposed penalty in the community/social exchange game can deter free-riding in the irrigation game, even if the incentive constraint in the irrigation game is not satisfied when it is played independently” (Aoki, 2001: 73).

The common consensus between institutionalists, environmentalists and political scientists is that, in the absence of effective governance institutions at the required scale, natural resources and the environment are in peril from overuse and mismanagement (Dietz *et al.*, 2003). However, it is argued that there is no unique way of defining a “suitable” institutional arrangement because different institutional governance systems bring different outcomes depending on the features of the resource as well as the location in question (Griffiths *et al.*, 2007). Furthermore, institutional arrangements are often complex and diverse, with many layers of hierarchies, different markets and variable interests from beneficiaries (Agrawal, 2001; Griffiths *et al.*, 2007; Libecap, 2008).

Ostrom (1990) and Weinstein (2000), among other scholars, have identified several general principles for robust governance institutions for natural resources. Their assertion is that each principle is relevant for meeting several requirements, as indicated in Figure 2.3. Principles necessary for robust institutional governance for local resources are outlined in the first column. The second column represents a list of requirements, while the third column indicates the list of principles necessary for robust institutional governance for regional and global natural resources. The arrows are used for mapping some of the most likely connections between principles and requirements. The principles indicated in Figure 2.2 are in line with those identified by some new institutional economists that define an effective resource institution as one with a number of features such as unambiguous objectives, adaptiveness, compliance ability, technical rationality, good interaction with other institutions, political and organisational rationality, as well as appropriateness of scale and scope (Gandhi and Crase, 2009).

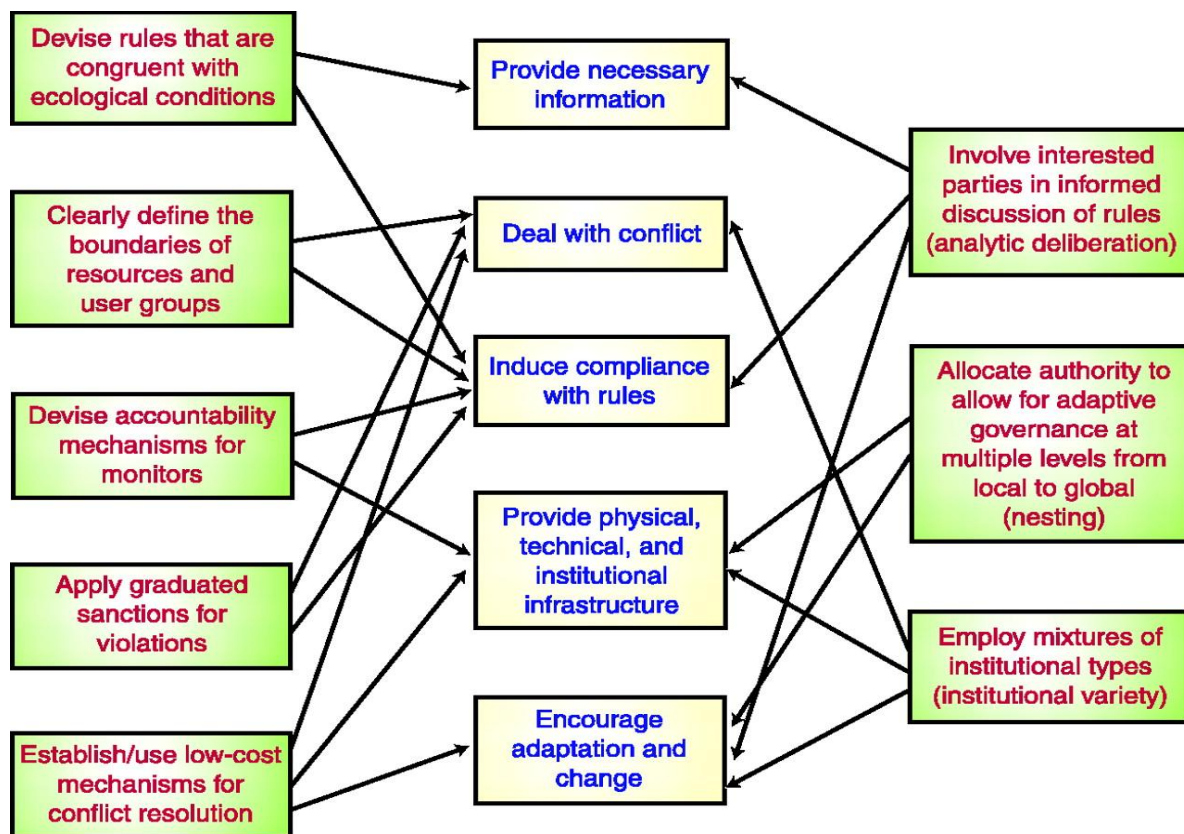


Figure 2.3: Principles necessary for robust institutional governance. (Source: Dietz *et al.*, 2003)

There is an array of academic literature across disciplines on other models for evaluating the performance of institutions. One of such models is the ‘economy-efficiency-effectiveness’ model, commonly known as the 3Es model. In the model, ‘economy’ is defined as the expenditure associated with obtaining specific service inputs (Boyne, 2002). However, it is argued that economy in itself adds little value in evaluating the performance of an institution because it reveals nothing about the failure and/or success of the institution in question (Bouckaert, 1993; Boyne, 2002).

Efficiency is loosely defined as “doing things right” (Elebring *et al.*, 2012). Efficiency is commonly understood as an internal measure of process operations in terms of resource use. The resources could be monetary or non-monetary in nature. Generally, institutional inefficiencies are a result of number of factors, such as inaccessible information, high transaction costs, and corruption, among other factors (Dietz *et al.*, 2003; Engle *et al.*, 2011). According to Mihaiu *et al.* (2010), measuring the efficiency of a public institution has often proved to be difficult. The difficulty is largely due to the failure to find measures needed for

accurately quantifying the public institution's outputs as such outputs are often both direct and indirect depending on the type of externalities which they generate (Mihaiu *et al.*, 2010). Economists define the term 'efficiency' in two ways, namely 'technical efficiency' and 'allocative efficiency'. Technical efficiency is defined as "the per unit output" (Boyne, 2002: 17). Allocative efficiency refers to sensitivity or "responsiveness of services to public preferences" (Boyne, 2002: 18). The model uses the technical efficiency concept because, in some instances, services that are considered to be efficient may be of no significant value (Boyne, 2002).

Effectiveness is often referred to as "doing the right thing" (Elebring *et al.*, 2012). It is often viewed as an external measure of the success of formal objectives (Boyne, 2002). Ineffectiveness can be due to the lack of a clear set of objectives, lack of a clear communication line, and divergent expectations of stakeholders, among other factors (Mandl *et al.*, 2008). Environmental factors, which are often socio-economic in nature, have a major influence on effectiveness (Mihaiu *et al.*, 2010). Several indicators such as the quality, quantity and accessibility of services provided by, or through, the institutions are used to measure output.

Equity is loosely defined as fairness and/or impartiality (Boyne, 2002; Aderies *et al.*, 2013). Equity of service provision forms a vital component of outcomes (Boyne, 2002). Public institutions are expected to embrace equity through the allocation of resources based on criteria of need rather than ability to pay (Boyne, 2002). According to Aderies *et al.* (2013), the institutional arrangements, which consist of adaptive rules can skilfully take equity and fairness issues into account. Figure 2.3 summarises the 3Es model as well as the inputs-outputs-outcomes relationships.

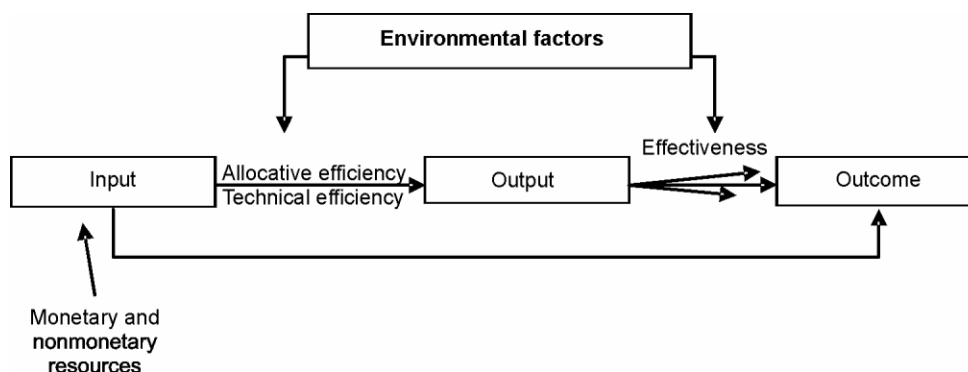


Figure 2.3: The 3Es model of performance. (Source: Mihaiu *et al.*, 2010)

2.6.1. Efficiency, effectiveness and equity in new institutional economics

New institutional economists argue that institutions affect performance through determining the cost of transacting and producing, as well as through defining property rights (North 1997; Gandhi and Crase, 2009). One of the key assumptions posited by new institutional economists is that real costs of economic activities include greater than zero transaction costs (Saleth and Dinar, 2004). It is reasoned that a failure to acknowledge the positive transaction costs that institutions face often results in a significant reduction in efficiency and effectiveness as performance measures for institutions (Gandhi and Crase, 2009). This is a contradictory proposition to that of neoclassical economists. In neoclassical economics, transaction costs are assumed to be zero. Consequently, institutional efficiency is meaningless as institutions are “allocation neutral” (Richter, 2012: 2). Furthermore, new institutional economists argue that the concept of equity is not sufficiently described by neoclassical economics models such as the general equilibrium model wherein perfect competition is Pareto efficient but not necessarily socially equitable (Richter, 2008).

According to Gandhi and Crase (2009), an ‘ideal’ institution is the one in which transaction costs are kept to a minimum, incentives associated with certain property rights associated with the resources are well defined, and the benefits of collective action are maximised. NIE essentially operates on the premise that efficient economic and institutional management is a result of evaluating various contractual and institutional arrangements to find the most appropriate means to conduct a transaction at the least possible cost (Brousseau and Glachant, 2008).

In the early 20th century, relative institutional efficiency was measured using the firms' realised positive profits - an "*ex post* measure" (Richter, 2012). The main shortcoming of using an *ex post* measure is that it is often characterised by maladaptation to various economic environments because it is premised on the assumptions of common knowledge and zero transaction cost bargaining (Williamson, 2000; Richter, 2012). The inadequacy of the *ex post* measure prompted the development of *ante post* measures of institutional efficiency under all of the assumptions proposed by new institutional economics (Richter, 2008 and 2012).

Williamson's (1996) transaction cost approach theory argues that economic agents are able to forecast and identify potential risks, and hence they are able to formulate responsive institutions that adapt to various contractual relations. New institutional economists define such institutions as "efficient" (Richter, 2008). North (1990) defines efficiency as the ability of the institution to withstand a large set of dynamic problems it faces from time to time. Williamson and North's definitions of new institutional economics efficiency encompass both adaptability and transaction costs concepts.

Richter (2012: 3) neatly sums up both of the descriptions and defines new institutional economics efficiency as "a term that comprises both economic effective transactions today and effective adaptability to unknown states of the world in the future". This definition reflects how intertwined the concepts of efficiency and effectiveness are. It could hence be argued that in NIE, effectiveness is a necessary condition to achieving efficiency. This reasoning seems to find support in Mihaiu *et al.*'s (2010) assertion that there is essentially no way an institution could be efficient without being effective because it is more important for institutions to do what they have proposed well, than do well something else that was not necessarily initially proposed.

McDonough and Braungart (2002) posit that equity should continually operate as one of the anchors to a spectrum of values of a social institution. Equity between people and generations is defined as the state of applying equal rights of all peoples to environmental and/or natural resources (Gray and Bebbington, 2000; Young and Tilley, 2006). Economists have traditionally underestimated the importance of including "fairness" as well as

individuals' ideological preferences in the designation of property right as constants in their modelling of institutional performance, often leading to flaws in estimation of their models (North, 1986). According to Boyne (2002 and 2010), including indicators of equity in performance models can help establish whether a social institution is meeting its mandates, and to measure the degree of fairness between services offered by the institution or across jurisdictions covered by the institution.

2.7. Conclusion

One of the main propositions of NIE is that institutions influence public choice and human behaviour. The NIE relaxes some of the assumptions of neoclassical economics, such as the availability of perfect information for all economic agents, zero transaction costs and unbounded rationality (Poel, 2005; Rossiaud and Locatelli, 2010). This school of thought draws lessons from various disciplines such as politics, anthropology and sociology, among others, hence it can be argued that its ideas are relevant in policy formulation, policy implementation and socio-economic needs of communities in developing countries (Deacon and Mueller, 2006; Thiel *et al.*, 2012).

The chapter also discussed how NIE concepts of property rights, transaction costs, collective action and political economy address issues of natural resource management. It also discussed how the NIE defines the concepts of equity, efficiency and effectiveness (North 1997; Gandhi and Crase, 2009; Mihaiu *et al.*, 2010). The following chapter analyses water resource governance in the South African and international cases using the theory discussed in this chapter.

CHAPTER THREE

INSTITUTIONAL PERFORMANCE IN THE WATER SECTOR

3.1. Water as an economic good: Meaning and implications

Since the 1992 Dublin conference on Water and Environment, resource economists have widely accepted water as an economic good whose price is charged against its value, and whose allocation could be improved through integrated decision-making (ICWE, 1992; Savenije and van der Zaag 2002). An 'economic good' is defined by Rutherford (2002: 160) as "(a) scarce good, yielding utility, which must be allocated either by rationing or by the price mechanism; not a free good".

According to Yuling and Lein (2010), regarding water as an economic good is crucial, not only ensures that this scarce resource is used more efficiently, but also creates a basis for cost recovery. The former argument implies that if water is not treated as an economic good, it is more likely to be subject to overuse and inefficient use, leading to water crises and shortages in a given location. In South Africa, water is regarded as an economic good that has to be used and allocated in the most efficient, effective and well-organised way possible in order to ensure that the macroeconomic objectives of the country are promoted (Earle *et al.*, 2005).

As an essential natural resource, the economic value of water is incontestable (Yuling and Lein, 2010). However, water should not be treated like a normal economic good as this natural resource displays a large array of features that distinguish it from other economic goods. Such features include that: water is vital for human activity, economic production and ecosystem survival, water is scarce, water is fugitive, water is a system, water is bulky, water is non-substitutable, water is not freely tradable, and water is complex (Gribble, 1999: Savenije, 2002).

3.2. The complexity of water: Exploring the concept

There seems to be consensus among ecologists that water access, distribution and sustainability are emergence properties, hence qualifying them as complex systems (Berkes *et al.*, 2003; Audouin *et al.*, 2013). According to McFallan *et al.* (2011: 30), “a complex system is a system that shows emergence behaviour that is more than a sum of the parts of the system alone”. The concept of “emergence” in this context is used to describe a system that portrays properties such as rich, dynamic and non-linear interactions that often provide output known as feedback (Cilliers, 2000; Berkes *et al.*, 2003; Mitchell, 2009; Audouin *et al.*, 2013).

The role of water as a social, environmental, financial and economic resource, as well as its role in fulfilling a basic need has prompted economists to appreciate that water is complex or “at least very special” compared to other economic goods (Savenije, 2002: 173). The following characteristics define the complexity concept using economics theory:

Water has no homogeneous market

Water is used as an input in various sectors and sub-sectors in the economy and these sectors portray different characteristics. Some users may have both low ability and willingness to pay, yet they require large water quantities, while others may have either high willingness to pay for small water quantities, or high willingness to pay for large water quantities (Savenije, 2002; Van der Zaag and Savenije, 2006). Different users of water cannot be amalgamated into a single market. Economic principles can be employed to set a suitable water price within one of these sectors, but such principles cannot be equally applied between sectors (Savenije and Van der Zaag, 2001; Van der Zaag and Savenije, 2006).

Water and property rights

According to Grimble (1999), water resources are initially publicly owned, but this type of ownership undergoes a transition from public to communal and/or private ownership

during the collection and delivery stages. Grimble (1999: 80) further posits that “(w)here property rights are communal or unclear there are particular difficulties attached to charging, especially in open-access situations with access by free-riders.” Where property rights are private, individuals have an incentive to use water resources efficiently (Saleth and Dinar, 2004: 12). However, some of the physical properties of water create co-dependency and conflicts among rightful owners of water rights (Savenije, 2002; Saleth and Dinar, 2004). In most cases, the government has the responsibility of providing safe water resources for both households and industries (Van der Zaag and Savenije, 2006).

Water using activities display macroeconomic interdependencies

Water using activities are interdependent across various economic sectors and the relations of inter- and multi-sectoral water uses are complex (Van der Zaag and Savenije, 2006: 15). This implies that water demand, access and management issues in one sector of the economy may have an impact on production, employment, incomes and overall consumer welfare patterns in other economic sectors.

Water has high production and transaction costs

Potable water services have higher transaction and production costs, and they require sophisticated and costly quality production mechanisms (Bel *et al.*, 2010: 558). Water transportation and reallocation requires the use of pumps, billing, boreholes, metering, canals, pipelines, dams, reservoirs and other instruments that entail cost incurrences (Savenije, 2002: 743).

3.3. Water uses and challenges in the water sector

Most developing countries are lagging behind not only in adopting, but also in implementing strategies that are sustainable, financially viable and ecologically sensitive in their mandate of ensuring equitable water allocation (Pähle and Pahl-Wostl, 2012). Scholars of institutional economics attribute the shortage of water resources in many societies to inadequate

management and institutions (Saleth and Dinar, 2004; Saravanan *et al.*, 2009; Pähle and Pahl-Wostl, 2012).

Water institutions in South Africa and other developing countries are faced with a number of challenges, such as lack of clarity in respect of institutional arrangement and provisions, which can lead to a failure to provide water resources effectively (Saravanan *et al.*, 2009; Clifford-Holmes *et al.*, 2012). Other constraints include ever-increasing demands for water resources, fragmented water institutions, diminishing supply of water resources, unfavourable climate changes, and lack of finances for infrastructural development in the water sector, among others (Lorz *et al.*, 2011; Du Toit *et al.*, 2011; Engle *et al.*, 2011).

Generally, in developing countries, the observable role of governing water resources is played by local and national institutions, using the water sector's underlying regulations, policies as well as statutory enactments (Water Partnership Program (WPP), 2002). Other roles played by local and national institutions include: arbitration and conflict resolutions between and/or among stakeholders; monitoring of water service providers and water users; and implementing strategic and sustainable planning for efficient use of water resources (Sullivan, 2002). These institutions are often faced with complex natural resource limits, prompting new thinking about successful resource management strategies as well as sustainable resource use (Swilling, 2010; Lorz *et al.*, 2011).

3.4. Governance in the water sector

Previously, governance was perceived to be almost a synonym for government, and it was associated with bureaucratized control and authoritative power and control (Tropp, 2007). The current perception of governance is much broader than it used to be. According to the United Nations Development Programme (UNDP), governance defines the ways through which citizens can make their voices heard and their constitutional rights respected (UNDP, 2004). Alternatively, the World Bank (WB) defines governance as a set of traditional and institutional channels through which the authority of the country is exercised (WB, 2004).

Scholars have developed varied definitions for water governance (see generally Ivanova, 2002; Castree, 2005; Bakker, 2007). Most of these definitions of water governance are in line with the authoritative-control definitions of governance. For the purposes of this study, water governance is defined as “...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” (Rogers and Hall, 2003: 7). This definition puts emphasis on the water management process, as well as on the ties between different stakeholders at various levels of the water sector.

The overall processes and functions of the institutions involved in water allocation and management are defined within the existing governance framework in the country in question (WPP, 2002). The issues of water governance and the overall governance of the economy should be treated as two sides of the same coin. This is because forms of governance are, in one way or the other, both striving to achieve equitable distribution of resources, improve participation, transparency and accountability, and to reduce mismanagement of resources (Rogers and Hall, 2003; Plummer and Slaymaker, 2007). Furthermore, it is argued that there seems to be a direct relationship between good water governance and good governance (Plummer and Slaymaker, 2007). Weak governance in the country often translates to weak governance in the water sector, leading to poor access to water resources by the citizens, poor service delivery in the water sector and mismanagement of water resources (WPP, 2002).

According to Plummer and Slaymaker (2007), many countries are faced with the challenge of poor access and service delivery. However, the challenge is a symptom of an underlying problem in the water sector. For these issues of poor access to water resources to be addressed, the vital step is to start by addressing the underlying issue of governance in the water sector (WPP, 2002). Ensuring appropriate and transparent budgeting practices by public institutions in the water sector is one of the key elements that could lead to effective governance (Dollery and Graves, 2009).

3.5. International water policies and legislation

National water policies for many countries have universal features. This could be because the water-related problems such as scarcity, common property complications, inefficiency and inequitable allocation of water resources are common faced by many countries (Mehta, 2007).

The countries often adopt water policies, laws and plans in an effort to achieve two main objectives. The first objective is often aligned with the macroeconomic goals of the country, such as poverty reduction, attainment of short-, medium- and long-term visions of the country, and for maintaining peace and security (WPP, 2002). The second objective is to ensure that resources are not lost through corrupt, ineffective and inefficient operations of institutions responsible for water-services delivery (Dollery and Graves, 2009). The latter is necessary for improving stakeholder participation and ensuring accountability and transparency in the handling of finances directed to water resources in order to maximise the benefits from irrigation, infrastructural development, and overall service delivery from the water sector (WPP, 2002).

There are two main approaches used in policy-making processes in the water sector, namely centralised and decentralised policy-making. The study conducted by WPP (2002) revealed that the quality of policy outcomes is largely dependent on the approach employed in policy development. The centralised policy-development system uses a top-down hierarchy where policy formulation and sector planning are tailored by ministries using information gathered from water users associations and local government structures (Saletha and Dinar, 2000). Some of the advantages of a centralised policy-development system include: stabilisation of macroeconomic policies, equitable provision of public goods, creation of a single market through trade barriers, and redistribution of resources across citizenry (Tabellini, 2002).

Despite its popularity in a large number of countries, the centralised system has significant opposition. The opponents of this system argue that it fails to incorporate the individual needs of societies (Plummer and Slaymaker, 2007). A decentralised system, on the other hand, involves local governments and water users in policy-formulation through

encouraging networking, building relationships and emphasising negotiation and collective action (Tropp, 2007). Some institutional economists argue that institutional efficiency could be achieved through some forms of decentralisation such as public-private partnerships (PPPs).

Decentralised water service systems, however, have a number of shortcomings. In a study by Wilder and Lankao (2006) on the social implications of decentralisation of water services in Mexico, it was found that decentralisation failed in the attainment of more efficient, sustainable, and accountable management of water under private management arrangements. Despite the implementation of a wide variety of decentralisation systems over the years across nations, it was found that decentralisation has not yet uniformly yielded either the efficiency gains or environmental benefits anticipated (Gleick and Wolff, 2002; Wilder and Lankao, 2006; Calabrese *et al.*, 2012). Another framework within which policy-makers try to move the skewed water redistribution towards greater equity is IWRM (Haigh *et al.*, 2010).

The concept of IWRM was developed in the 1990s to facilitate sustainable water resource management and use, and has continued to be influential in the water sector to date (GWP, 2000; Braga, 2001; Saravanan *et al.*, 2009). The underlying philosophy of the IWRM process is to “promote the co-ordinated development and management of water and land so as to maximise economic and social welfare without compromising the sustainability of vital ecosystems” (Haigh *et al.*, 2010: 475). IWRM is an approach that aims to address persistent problems in the water sector such as institutional inefficiencies, poor service delivery, a lack of integrated planning and allocation of water resources, and lack of participation of some relevant water sector stakeholders (Milly *et al.*, 2008; Du Toit *et al.*, 2011).

There are different approaches and conceptualisations of IWRM, such as Habermasian communicative rationality approach, and the World Bank’s “comb” conceptualisation. The Habermas approach promotes the making of rational choices through communicative action in the water sector’s institutions (Habermas, 1984, 1987 and 1990; Flyvberg, 2000; Saravanan *et al.*, 2009), and it is in line with the collective action approach put forward by Ostrom (1990) and Ostrom *et al.*, (1994). The World Bank views IWRM as a “comb” which

has various water-using sectors as the “teeth” and water resources itself defined by its quantity, quality and location as the “handle” (WB, 2004; Saravanan *et al.*, 2009: 78).

While the participatory principle proposed by IWRM is valuable in water management, some argue that the IWRM fails to address complexities and power dynamics and/or differentials in the water sector (Saravanan *et al.*, 2009: 76). According to Brown (2013: 273), “[a]n emerging body of evidence finds that power differentials impact negatively on the transformatory potential of participation”. Ioris (2008) argues that in most developing countries, the ability to translate IWRM goals into practice is often limited due to the contradictory directions of regulatory reforms. This is because in some developing countries such as Brazil and South Africa, water problems are highly complex and politicised (Ioris, 2008).

Legislation in the water sector plays an important role in determining the level of effectiveness of the governance mechanism in place through stipulating the roles of sector institutions, defining private and communal water rights, and linking policy to legal framework (WPP, 2002; Plummer and Slaymaker, 2007). According to Kaufmann *et al.* (2008), governments should set policies that are both enforceable and realistic given the available financial resources, human capital and other resources needed to enforce and implement them.

3.6. Institutional frameworks and requirements for efficient, effective and equitable water allocation

Many arid and semi-arid regions across the world are faced with the persistent problems of growing demand for water resources due to population and expanding economic activities. This has led to declining water supplies, which have consequently contributed to the rising cost of water (Ludwig and Moench, 2009). In some of sub-Saharan countries, the challenge of water scarcity has led to conflicts over water uses and allocation within many river basins (Kashaigili *et al.*, 2003). Many livelihood activities directly and indirectly depend on water resources, so that water scarcity leads to high poverty rates and stagnated growth of some low-income countries (Grafton *et al.*, 2011). There is an evident need, therefore, to develop

comprehensive policies and institutions that would enable efficient, sustainable and equitable allocation of scarce water resources.

Various studies have been conducted in an effort to devise ways of improving markets, typically from an economic efficiency perspective (Rosegrant and Binswanger, 1994; Easter *et al.*, 1999; Sullivan, 2002; Kashaigili *et al.*, 2003; Saleth and Dinar, 2004; Dinar and Saleth, 2005; Grafton *et al.*, 2011). Broader measures of evaluating the extent of inefficiencies in the water sector, such as water poverty indices, have been developed and devised as a result. However, the characterisations of water institutions in most studies define efficiency in terms of 'normal' market requirements without incorporating NIE and IWRM efficiency considerations in their descriptions (Sullivan, 2002; Kashaigili *et al.*, 2003; Saleth and Dinar, 2004; Dinar and Saleth, 2005; Grafton *et al.*, 2011).

Analysis and ranking of water institutions in terms of efficiency, effectiveness and equity requires the amalgamation of several indicators from an array of studies. Some studies analyse institutional governance within frameworks that use qualitative or quantitative criteria, or both. A framework developed by Grafton *et al.* (2011) assessed water institutions in using institutional governance indicators and economic efficiency.

3.6.1. Indicators for robust water governance institutions

Figure 2.3 in the previous chapter outlined the principles necessary for robust governance institutions for natural resources. This section narrows the discussion by using a framework for robust water governance institutions. The framework developed by Grafton *et al.* (2011) uses the following criteria to assess the institutional governance foundation for water resources:

a. Recognition of the public interest

In the framework, 'public interest' does not only refer to beneficiaries and end-users of water resources, but also refers to the environmental sustainability and conservation of ecosystems (Grafton *et al.*, 2011). Water institutions should be able to recognise legal

interests in water uses. For instance, Section 27.1(b) of South Africa's constitution confirms that everyone in the country has the right of access to sufficient water (RSA, 1996). Water institutions should also appreciate the multi-interest, multi-objective and multi-sectoral set of economic interests in water resources when allocating and redistributing water to different groups (Grimble, 1999; Savenije, 2002; Grafton *et al.*, 2011)

b. Administrative capacity of the institution

In most developed countries, institutions have the capacity to implement their governments' water policies due to the high level of financial and human resources (Grafton *et al.*, 2011). However, the capacity of developing countries to manage water resources effectively, efficiently and sustainably is often limited (Malzbender *et al.*, 2005; Grafton *et al.*, 2011). For example, social problems, such as poverty and skewed distribution of land, inherited from the apartheid regime are a constant factor inhibiting the successful establishment of CMAs in South Africa (Farolfi and Rowntree, 2007; Grafton *et al.*, 2011). Institutions which do not have adequate resources and administrative expertise and power often fail to manage water resources effectively. Furthermore, fragmented administrative authority often leads to "fractured water management systems" (Grafton *et al.*, 2011: 224)

c. Clear and well-defined institutional relationships

For effective and efficient management of water resources, institutions should display good interactions that are able to bring both formal and informal rules together, between and across governments and agencies (Gandhi and Crase, 2009). Well-defined institutional relations should not only exist internally, but should also govern the interaction of the institution with relevant external entities. Maintaining clear institutional relations helps promote accommodative and cooperative conflict resolutions and also reduces both internal and external transaction costs (Gandhi and Crase, 2009).

d. Adaptiveness

Institutional adaptiveness transpires when the institution is able to adjust to dynamic and unanticipated shocks, incorporate new and reviewed information, and respond promptly to fluctuations in societal preferences regarding water management and use (Gandhi and Crase, 2009; Grafton *et al.*, 2011). This contributes to maintaining minimal transaction costs (Gandhi and Crase, 2009).

e. Acknowledge of “priority of use”

Water is a basic human need. It is for this reason that access to clean and sufficient water resources is embraced as one of the international human rights (United Nations, 2010). According to the World Health Organization (WHO), human being should get access to daily water supply of between 50 and 100 litres (WHO, 2013). Water institutions should hence define ‘priority use’ of water in terms of the implications of treating water as a basic need, and also by outlining conditions relating to beneficial use of water resources, such as how water should be used (Grafton *et al.*, 2011).

3.6.2. Efficiency indicators

The two quantitative measures of the economic efficiency of water institutions discussed in this study are; volume and cost of water supplied, and estimates of the annual monetary gains. However, due to the unavailability of data on volume and cost of water supplied, the only indicator that will be analysed in chapter 7 is the estimates of annual monetary gains.

a. Volume and cost of water supplied

This measure provides a good indication of the ability of the water institution to supply water at the lowest possible cost. Efficiency is calculated as the ratio of operating cost per volume of water supplied (Woodbury and Dollery, 2004). Some countries have managed to maximise the ratio and attain efficiency by the implementation of technologies that have water-saving potential (Saleth and Dinar, 2004). Water institutions have to operate at the

“market transaction” point where their operation and maintenance costs are covered, or they are too low to have any impact on demand (Perry, 2001; Haldane *et al.*, 2010).

b. Estimates of the annual monetary gains

Calculating the annual financial gains accrued requires data on actual water transactions that have taken place (Grafton *et al.*, 2011). In countries where water is treated by a public good and water management falls almost entirely in the government’s realm, data are rarely available (Haldane *et al.*, 2010; Grafton *et al.*, 2011). The water sector in many developing countries is faced with a negative financial trend (Haldane *et al.*, 2010; UNESCO, 2012). This is due to factors such as poor cost recovery by water institutions, low water charges, failure of the institutions to invest in profitable water development projects, as well as failure to invest in maintenance of water infrastructure (Saleth and Dinar, 2004; UNESCO, 2012). These factors serve act as a threat, not only to the efficiency of water institutions, but also to the overall existence and sustainability of the water sector (UN, 2013).

3.6.3. Effectiveness and equity indicators

Effectiveness in the water sector is defined as the ability of water institutions to provide a suitable and adequate structure that can enable interactions and participation by various stakeholders in the sector with the lowest transactions costs (Bandaragoda, 2000). Effectiveness and equity considerations are included in several sub-categories of both institutional governance and efficiency such as recognition of public interest, acknowledgment of priority of use and policy requirements. It is often difficult to disentangle effectiveness from institutional governance (Menard and Saleth, 2011).

In a study by Roger and Hall (2003), nine quantitative and qualitative indicators of an effective water institution were identified, namely: transparency, accountability, regulation, civil society participation, communication, efficiency, incentive-compatibility, equity and sustainability. Of all the nine indicators of effectiveness, transparency, accountability, regulation, civil society participation and communication will be used in chapter 7 to analyse

the case study. The choice of the indicators is not only influenced by the availability of data, but also by the fact that efficiency and equity are extensively analysed in the case study.

In their study, Menard and Saleth (2011) added feasibility and 'replicability' as indicators of an effective water institution. It is argued that stakeholder participation in budgeting, policy implementation and project planning often improves accountability, transparency, sustainable management of resources as well as overall effectiveness of the institution (WPP, 2002). Similarly, factors such as lack of transparency, inadequate mechanisms for stakeholder participation and lack of accountability in the institution often lead to inequitable distribution and allocation of water resources (WPP, 2002; Roger and Hall, 2003; Menard and Saleth, 2011).

3.7. Conclusion

This chapter provided a narrow analysis of water institutions. It also discussed the meaning and implications of defining water as an economic good. It is argued, however, that water should not be treated as any other economic good because of its complexity feature (Savenije, 2002). Fragmented water institutions, increasing water demands, unfavourable climatic conditions among others, constrain the operations water institutions in many developing countries (WPP, 2002; Du Toit *et al.*, 2011; Engle *et al.*, 2011).

In South Africa, various water institutions operate at various levels in order to attain the objective of the country's water policy post-apartheid. Despite the general aims of equity, efficiency and sustainability outlined in the NWA of 1998, problems of urban-bias and lack of regard for the health state of wetlands by municipalities still persist in South Africa (Muller, 2005; Schreiner, 2007; Haigh *et al.*, 2010). The chapter discussed the institutional frameworks and requirements for efficient, effective and equitable water allocation, with emphasis on the framework developed by Grafton *et al.* (2011).

The following chapter provides an in-depth analysis of South Africa's water policy and legislation within a NIE. The underlying economic theory behind the South African national

water policy and its impact on the institutional design and operations of water users' associations (WUAs) is discussed in the following chapter.

CHAPTER FOUR

AN ANALYSIS OF SOUTH AFRICA'S WATER POLICY AND LEGISLATION: A NEW INSTITUTIONAL ECONOMIC PARADIGM

4.1. Introduction

The institutional landscape for water resource management in South Africa has changed significantly since the general review of Water Law in 1995. The review subsequently led to the publishing of the White Paper on National Water Policy (RSA, 1997), followed by the promulgation of the National Water Act (NWA) (RSA, 1998) which focused more on a decentralised participatory governance model to redress disparities in the water sector. This chapter provides a review of relevant water policy and/or statutes from a New Institutional Economics (NIE) perspective, using themes such as property rights, transaction costs and community participation discussed in chapter 2 in order to assess the success, or lack thereof, of post-apartheid water policy in South Africa.

In addition to analysing some of the governance indicators (discussed in chapter 3) within the South African context, the chapter also provides a brief overview of the water policies and legislation pre-1994. This exercise is not only important in describing the underlying institutional factors influencing water management, supply and access in South Africa, but also in defining the underlying economic theory behind the South African national water policy, as well as its impact on the overall institutional design and operations of WUAs.

4.2. Water policies and legislation in South Africa pre-1994

The institutional dynamics, policies and legislation that were prevalent during the apartheid era have left imprints that are difficult to ignore as they still dictate the interaction between different elements in the water sector to date (Nash, 2012). During the apartheid era, the formulation of policies was informed by racial segregation, resulting in a socio-economic pattern that dictated the distribution and access of resources for the people of different races in the country. Policy formulation was based on the notion of “separate development” (Thompson *et al.*, 2001: 7) and white supremacy.

The then applicable law, The Native Land Act of 1913, not only contributed to the skewed distribution and allocation of land resources against black South Africans, but also enforced stern restrictions on their property rights, leading to poor potable water access, poverty, illiteracy and malnutrition amongst people of this race (Thompson *et al.*, 2001). This broadened the inequality gap between the white people and people from other race groups (Thompson *et al.*, 2001; Nash, 2012). The existence of riparian water rights made the legislation excluding and racist as far as water access was concerned because of the indisputable link between land ownership and access to water (Thompson *et al.*, 2001).

Under apartheid, highly unequal access to water and water services by the country's population became entrenched, and an important aspect of the government's economic development is to meet a minimum set of 'basic needs' of the population and to reconstruct the social base of the country (Goldblatt and Glynn Davies, 2002). Within the framework of constitutional rights to water and a national Free Basic Water Policy (FBWP), water is defined of as a social good and forms an essential aspect of the broader developmental project (FBWP, 2002).

The National Water Act (RSA, 1998) has established the basis for management of water resources on a catchment basis (for equity, efficiency and sustainability), and the Water Services Act (RSA, 1997) aims to ensure everybody has access to basic water supply and sanitation services (Mokgope *et al.*, 2001). Regardless of the improvements in water supply to the rural sector made by the South African government, many of the current patterns of water use are still characterised by inequality, inefficiency, and inadequacy. The poor remain marginalised, and emerging farmers and poor rural communities have limited access to water resources while water continues to be used inefficiently by some farmers in the agricultural sector with few incentives to improve its water use efficiency (Thompson *et al.*, 2001; Brown, 2011; Karar *et al.*, 2011).

4.3. The Constitution of South Africa: Water law, property rights and equity

In South Africa, as in other democratic states, the Constitution is the supreme law of the country and any other law should conform to its provisions. Water law in South Africa is

aligned consistently with the provisions of the Constitution (RSA, 1996). In essence, water matters with regard to determination of public and/or private rights towards water resources are pre-described in the Constitution.

The old water laws in South Africa were biased against domestic water users and emerging farmers as they were skewed towards “supply-side management” (Stein, 2005: 2170), predominantly commercial and large-scale irrigation based agricultural sector. The new water laws are more inclusive insofar as water allocation is concerned. According to Stein (2005), in South Africa, water is a public, not a private, good which is managed by the state on behalf of all South Africans. Sections 27(1)(b) and 27(2) of the Constitution state that everyone in South Africa is entitled to adequate water resources, and the state is duty bound to achieve realisation of sufficient water provision through the use of legislature and other measures (RSA, 1996).

The Constitution, however, does not explicitly provide for the right to obtain and hold water rights under its property clause (Stein, 2005). Section 25 of the Constitution states that no one should be subject to deprivation of property and that the state can take legislative measures to redress water and land matter regardless of the property rights provided during a given time (RSA, 1996). New Institutional economists have established that for efficiency, sustainability and optimal allocation of natural resources to be achieved, property rights should be well-defined (North, 1990; Libecap, 1989; Alston and Mueller, 2003; Thiel *et al.*, 2012). They further argue that property rights should define the nature of the resource to be exploited, the timeframe for exploiting such a resource and the maximum amounts exploitable in a given time (Stroup and Baden, 1979; North, 1990; Libecap, 1989; Alston and Mueller, 2003; Thiel *et al.*, 2012). Subjecting the property rights clause to the proviso that legislation and other procedures comply, shows uncertainty and information vacuums which may act as disincentives for individuals and organisations given water rights.

Ecologists and economists assert that water access, distribution and sustainability display emergence properties, hence qualifying them as complex systems (Berkes *et al.*, 2003; Audouin *et al.*, 2013). According to Corson and Aziz-Alaoui (2009), a complex system

displays emergent properties if the behaviour of the system cannot be simply defined from the behaviour of its components. Essentially, emergent properties that cannot be identified through functional decomposition. Corson and Aziz-Alaoui (2009: 258) define emergent properties as “properties of the “whole” that are not possessed by any of the individual parts making up the whole”. Institutional economists postulate that water is complex or “at least very special” compared to other economic goods because of its roles as a social, environmental, financial and economic resource, as well as its role as a basic need (Savenije, 2002). Therefore, lack of clarity on the circumstances within which measures should be taken could create complications in the decision-making processes of those in power.

The Constitution of South Africa under the Bill of rights has effectively enshrined various socioeconomic rights including the right to access of water, and they have been viewed as progressive (Francis, 2005). Section 27 of the Constitution places responsibility of provision of sufficient water resources on government, not individual entities. Therefore, “a person who is deprived of access to sufficient potable water must assert that the government’s action (or inaction) is unconstitutional within the meaning of Section 27” (Francis, 2005: 45). Cases of inequitable water allocation and distribution reflect the failure of the government to fulfil its Constitutional obligations.

4.4. The National Water Act: Property rights, regulation and pricing strategies

The NWA has transformed the water regulatory landscape from the riparian system to a system aimed at achieving equitable water allocation for the benefit of all. It has done away with a private rights system of water allocation by detaching water rights from land ownership. The national government, through the Department of Water Affairs (DWA), has replaced the riparian rights system with an administrative permit system (NWRS, 2013). Subsequently, the NWA has established a public rights system in the water sector wherein the government plays the role of “public trustee” (Stein, 2005: 2167). The public trust principle not only gives the state a set of constitutional obligations, such as equitable provision of water resources, but also provides ways through which the state could give effect to such obligations (Stein, 2000 and 2005).

In South Africa, the public trust doctrine gives the state monopoly power over water resources, as the NWA entrusts the ownership and control of water resources to the state (Conradie *et al.*, 2001; Stein, 2005). Despite the state’s ownership of water resources, section 56 (1) the Act makes provisions and/or considerations for water allocation through the market by instituting price strategies for users and polluters. Through the imposition of pricing strategies, the Act aims to create incentives for effective and efficient water allocation as well as water use. The National Water Resource Strategy (NWRS) stipulates that in order for the supply of water to be reliable, three sets of costs should be considered; namely direct infrastructure and management costs, economic costs, and full costs. Direct infrastructure and management costs include costs of planning, monitoring and regulating, the cost of capital, as well as operation and maintenance costs. These are summarised in Figure 4.1 below.

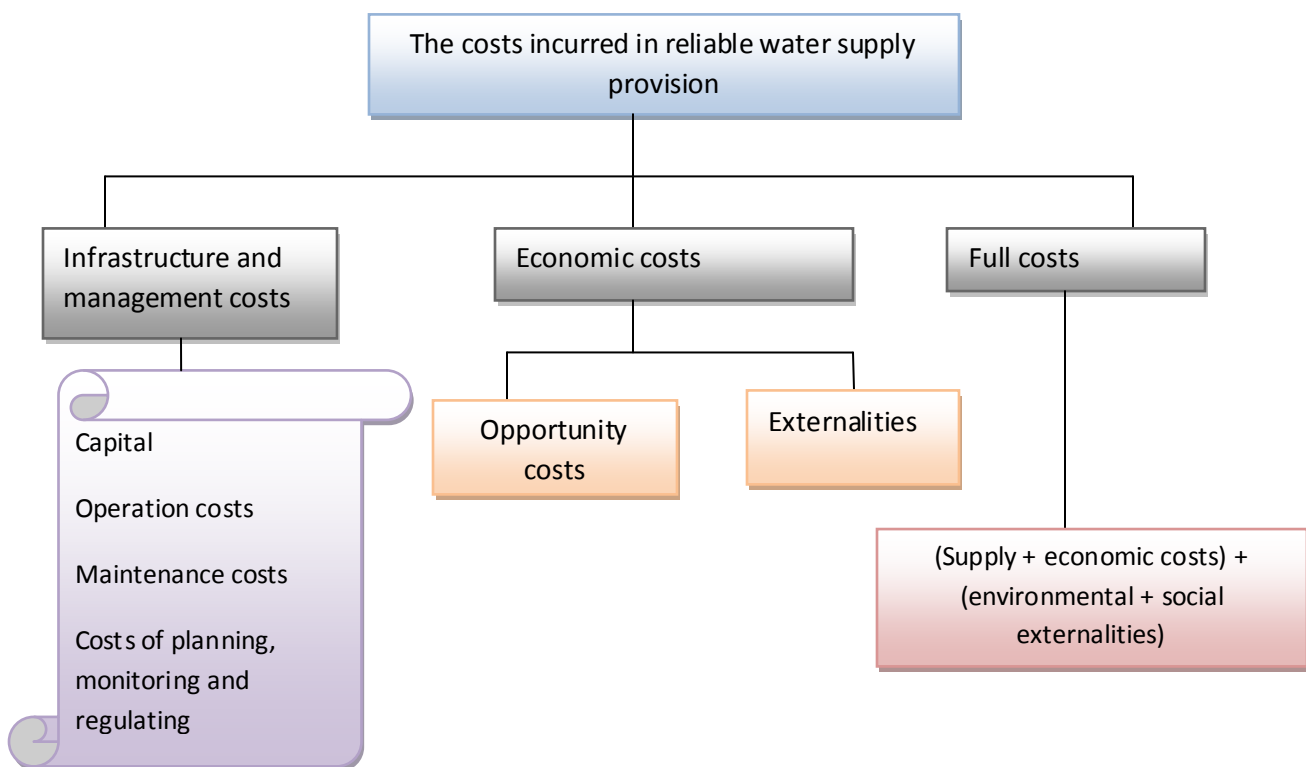


Figure 4.1: The costs incurred in reliable water supply provision. (Source: Adapted from RSA, 1998)

The first post-apartheid Minister of Water Affairs and Forestry, Kader Asmal’s first policy proposed that the supply of water to consumers should be done at the marginal cost, that is a price equivalent to the operating and maintenance costs (Asmal, 1998). According to the National Water Resource Strategy (NWRS) report of 2012, in South Africa, a sustainable price for water resources should promote provision of water at the least possible cost,

incorporate and reflect true costs of water supply, implement cost-sharing that will promote equity for all classes of people in the society, and should also ensure that water institutions' viability is enhanced in the long-run (NWRS, 2012). In essence, South Africa's White Paper on a National Water Policy recognises and appreciates that the transaction costs involved in the water allocation process are positive.

New institutional economists argue that economic agents are faced with greater than zero transaction costs (North, 1997; Challen, 2000; Saleth and Dinar, 2004). The Coasian viewpoint, enshrined by the Coase Theorem, is that positive transaction costs often have the potential of constraining 'efficiency-enhancing' reallocations (Cole and Grossman, 2000). Williamson (2000) argues that adopting transaction costs minimising and incentive-enhancing governance strategies not only contributes to the realisation of mutual gains between concerned parties, but also the crafting of conflict mitigation mechanisms (Williamson, 2000).

The incentive-enhancing governance strategies encapsulated in the NWA can be argued to be a reflection of the recognition of economic externalities. The Act is mandated to curb negative externalities, such as pollution of water bases, through pricing strategies (RSA, 1998).

4.5. National Water Policy: Water as an economic good and the complexity of water

The White Paper on a National Water Policy states that, "Under the new system, allocations will be made on the basis that it promotes water use that is optimal and for the achievement of equitable economic and social development" (RSA, 1997). In essence, it acknowledges that water has economic and socio-ecological value. It also recognises water as a complex system in which it is difficult, if not impossible, to disentangle socio-economic benefits from socio-ecological costs and benefits attached to the use of water resources (NWRS, 2012). A complex system portrays properties such as rich, dynamic and non-linear interactions, and water qualifies as one (Cilliers, 2000; Berkes *et al.*, 2003; Mitchell, 2009).

According to Dent (2004, 2006 and 2008), ideal water institutions should make certain considerations when dealing with water demands. Firstly, a commitment should be made by stakeholders to work cooperatively despite their competing water uses (Dent, 2006; Meissner *et al.*, 2013). Further, institutions should maintain constant communication dialogue and eliminate communication barriers between the management of institutions and the beneficiaries (Dent, 2006; Meissner *et al.*, 2013). It is posited that well-functioning and long-term relationships should be built between end users of water resources and water institutions (Dent, 2006 and 2008; Meissner *et al.*, 2013). Moreover, water management institutions should not only invest in innovation and technical advancement, but also in environmental management (Dent, 2006; Meissner *et al.*, 2013). Lastly, water management institutions should appreciate the multi-sectoral uses of water resources and understand the existence of inter-linkages of stakeholders in various hierarchies in the water sector (Dent, 2008; Meissner *et al.*, 2013).

In a nutshell, the decision on how best to allocate water between contesting uses necessitates a complex and multidimensional assessment, which takes into account a range of social, economic and ecological values emerging from various water uses (NWRS, 2012 and 2013).

It can be argued that the National Water Policy of South Africa not only acknowledges the interconnectedness of levels of economic institutions in the water sector, but also recognises the multi-sectoral uses of water resources. However, the relevant policies seem to adopt a one-size-fits all approach, without special regard to social norms, traditional values and customs. For instance, the NWA of 1998 mandates WUAs to be accountable to government institutions such as the Department of Water Affairs Regional Office (DWA-RO). As argued by Kapfudzaruwa and Sowman (2009: 691),

“Failure to acknowledge and incorporate aspects of these traditional governance systems may undermine the very purpose of the [National Water] Act, namely to facilitate access to water for productive purposes for the poor, through establishment of new water management institutions and equitable allocation of water resources”.

The failure of the NWA to recognise and incorporate social norms and customs is more likely to lead to the persistence of skewed distribution of water resources and other problems that the Act aims to redress. New institutionalists argue that some of the malfunctions of the water sector are partly due to failure of the relevant water policies to incorporate social norms, rules and behaviours of agents (North, 2000; Joskow, 2008).

4.6. National Water Policy: Decentralisation, community participation and cooperative governance

The NWA makes provisions for cooperative governance and decentralisation in the water resource management processes. These provisions are in line with world trends wherein decentralisation is largely embraced in an effort to promote public participation as well as local socio-economic development (McEwan, 2003; Funke *et al.*, 2007; Meissner *et al.*, 2013). There are two distinct interpretations for the trend: positively as a potential model for good governance, or negatively as an admission of lack of accountability and failure of the state (McEwan, 2003). The NWA and the Constitution of South Africa use the former argument to validate the role of the community in the management, protection, conservation and sustainable use of water resources (RSA, 1998). Theoretically, the participative approach is enhanced by decentralisation of governance. For efficient and effective accomplishment of water management processes, it has been noted that local governance should be promoted and water management responsibilities should be transferred to water users associations (Meissner *et al.*, 2013; Kemerink *et al.*, 2013).

Several clauses in the NWA promote community participation in the water sector in South Africa. For instance, chapter 2 advocates for the establishment of appropriate institutions that enable community representation and participation (RSA, 1998). Section 9 (g) proposes that a catchment management strategy must empower community members to play an active role in managing the water resources within its water management area (RSA, 1998). Section 80 (e) acknowledges the role of the community in the effective and efficient management and conservation of water resources (RSA, 1998). Chapters 2, 7 and 9 of the NWA call for the establishment of catchment management strategies (CMSs) that enable public participation, establishment of catchment managements agencies (CMAs) that closely

work with communities within a formal setup, and the development of necessary capacity of CMAs through establishing advisory committees respectively (RSA, 1998). CMAs are accountable for ensuring sustainable water use through community participation and overall cooperative governance (RSA, 1998; Pieterse *et al.*, 2012). The relationship between various clauses of the NWA is represented in Figure 4.2.

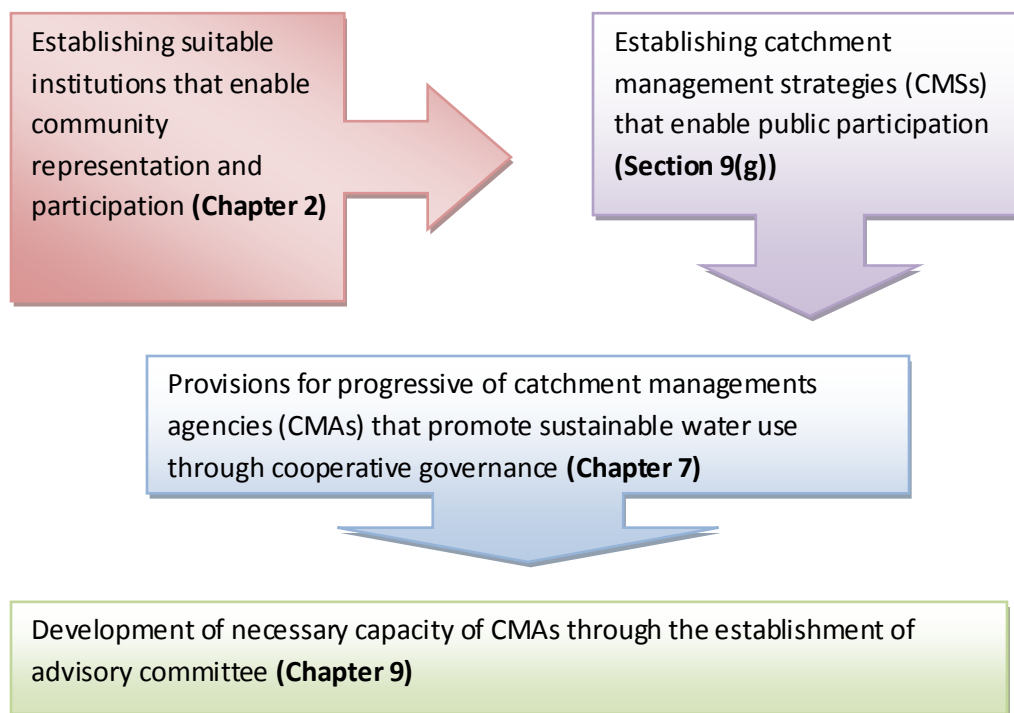


Figure 4.2: The relationship between various clauses of the NWA of 1998. (Source: Adapted from RSA, 1998).

The cooperative governance enactments in the NWA of 1998 conform to the ideas NIE, in terms of their view of cooperative governance as a potential way of dealing with the free-rider problem and managing externalities (Poteete *et al.*, 2010; Ostrom, 2010). They further argue that cooperative governance plays a crucial role of managing common property resources (Duncan, 2003; Ostrom, 2004 and 2010). Some literature uses the terms cooperative governance and collective action interchangeably to refer to public participation (Duncan, 2003; Ostrom, 2004 and 2010; Poteete *et al.*, 2010; Pieterse *et al.*, 2012; Meissner *et al.*, 2013).

According to new Institutional economists, cooperative governance can take a multiplicity of forms, ranging from highly structured processes of cooperative and inclusive decision

making, enactment, and accountability, to informal structures at micro levels (Duncan, 2003; Cox *et al.*, 2010; Ostrom, 2010; The Global Compact, 2013). They further argue that the micro levels related to agriculture, natural resources and institutional development need to be considered when making public policies (Duncan, 2003). According to Ostrom (2010), individuals almost never possess perfect information, as per the assumptions of behavioural theory, but they are capable of absorbing knowledge through interaction in a particular setting. Therefore, cooperative governance could serve as an effective strategy for achieving sustainable development, equitable distribution and allocation of water resources as well as internalising ecological externalities (Adhikari, 2002). Institutions that embrace cooperative governance are argued to be an advantage because of the creation of a large pool of shared ideas to help overcome water management challenges in an inclusive manner (The Global Compact, 2013).

4.7. Policy and water challenges currently faced by South Africa

Despite the fact that the regulatory framework and institutional landscape for water management have reformed since the attainment of democracy in South Africa, the water sector is still facing challenges. Some of the goals of the post-apartheid water law and policy have not been achieved (NWRS, 2012 and 2013). South Africa had made considerable progress in widening of access to water and sanitation across races, but this progress has decelerated in recent years (NWRS, 2012). The number of poor people without access to adequate water resources is still too large (NWRS, 2012 and 2013).

The share of the population without access to an improved water source declined from 17% in 1990 to 9% in 2010 (WHO, 2010). However, the performance of the sector has fallen short of expectations. One of the direct effects of lack of access to water resources is poverty especially in communities where livelihood activities are dependent on water resources (DWA, 2010). South Africa is thus faced with the challenge of developing “water resources management as a tool, and not an end in itself” (DWA, 2000: 29). This means that water resource management should be treated as a component in the general attempt of the country to achieve socio-economic equity, environmentally just and inclusive growth objectives.

Furthermore, water resources in South Africa are not being managed in a sustainable manner and the country remains water-stressed (NWRS, 2012). According to Global Policy Forum, the term 'water-stress' is used to describe conditions in which the amount of water available for access for each person in a country is less than 1500 cubic metres per annum (UNESCO, 2012). In South Africa, the current water supply is severely constrained by insufficient aquifers, unpredictable rainfall patterns and low levels of rainfall (Boccaletti *et al.*, 2010). The situation of water-stress is expected to get worse by 2030. The estimated water supply will be 15 billion cubic metres, while water demand is expected to be 17.7 billion cubic metres in 2030 (Boccaletti *et al.*, 2010). According to Boccaletti *et al.*, (2010), the effects of climate change could aggravate the problem significantly, resulting in an increase in the deficit gap by 1.1 billion cubic metres.

Moreover, there has been overall poor performance in the water sector due to lack of clarity with respect to institutional roles and responsibilities in the sector (NWRS, 2012). New Institutional economists posit that, for effective and efficient management of water resources, well-defined institutional relationships should exist to eliminate uncertainty and ambiguity in the roles of the agents (Gandhi and Crase, 2009). Maintaining clear institutional relations contributes to the promotion of accommodative and cooperative conflict resolutions and reduces transactions costs (Gandhi and Crase, 2009).

Some of the institutional reforms proposed by the NWA of 1998 such as the establishment of catchment management agencies (CMAs) are yet to be implemented in many areas (NWRS, 2012). CMAs are primarily responsible for crafting and managing of catchment management strategies (CMSs) through which they would be able to perform duties such as water resource planning in a particular catchment, licensing, water charge collection, and water use authorisation with ease (Kapfudzaruwa and Sowman, 2009). CMAs are also responsible for regulating and controlling water demand (Farolfi, 2004) in order to assure socio-economic development for all (RSA, 1998). According to Chapter 7 of NWA (1998), CMAs are responsible for ensuring sustainable water use through community participation and overall cooperative governance. These duties are aligned with international water management theory which argues that managing water within a catchment or river basin is

both a necessary and sufficient condition for effective and efficient management (Malzbender, 2005).

The NWRS-1 proposed the establishment of the 19 CMAs (NWRS, 2004). However, due to financial, capacity, skills and expertise constraints, the successive NWRS-2 has since proposed the 19 WMAs initially recommended by NWRS-1 be consolidated into nine as reflected in Figure 4.3 (NWRS, 2014).

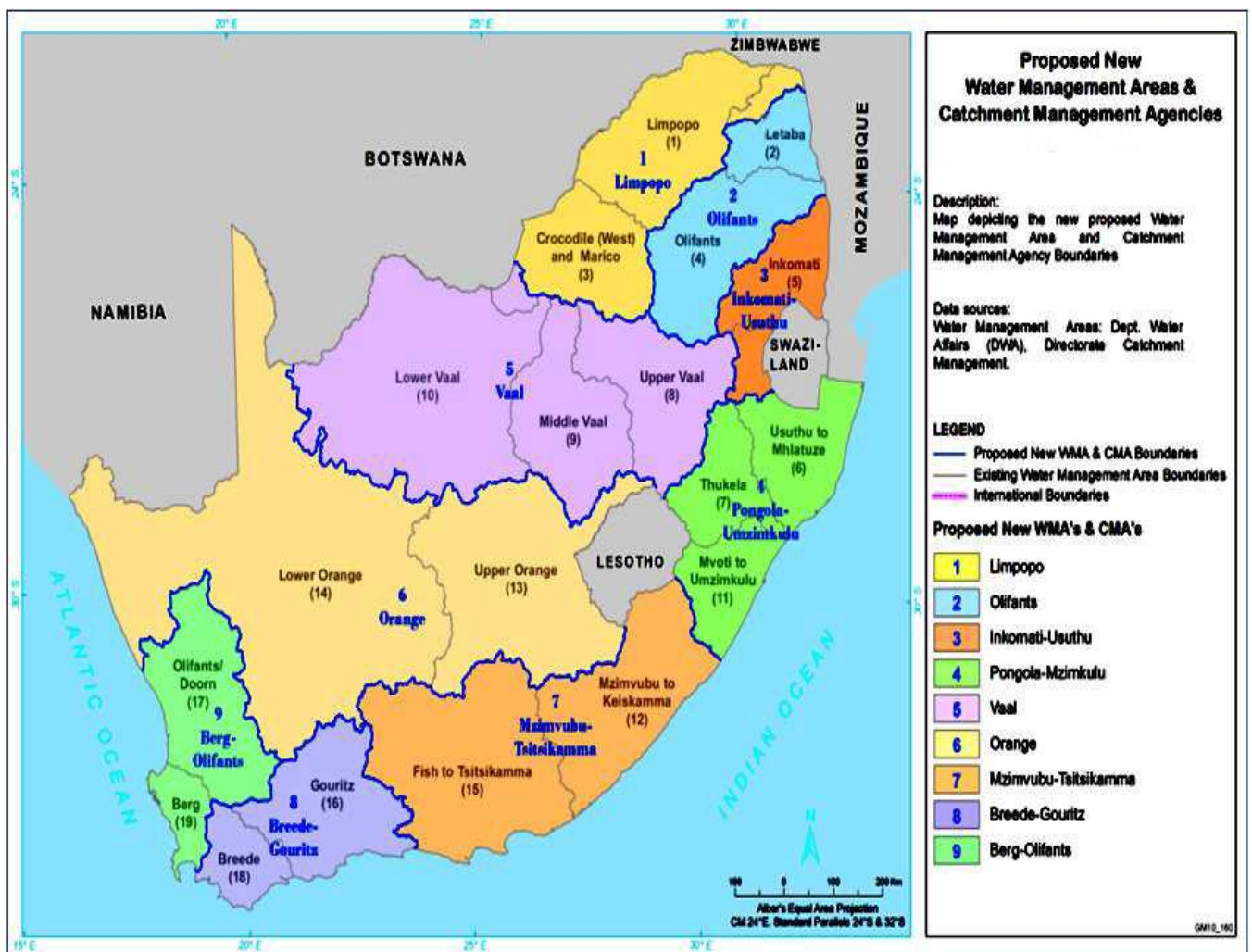


Figure 4.3: Map of the Proposed 9 Water Management Areas. (Source: NWRS, 2012)

According to the NWRS (2012), the creation of new boundaries would lead to broader inter-sectoral communication as well as better cooperative governance. A more inclusive cooperative governance is argued to be a more effective water resource management

strategy as it is likely to be more responsive to the needs of the marginalised and the poor in the community (Pieterson *et al.*, 2012; NWRS, 2012; The Global Compact, 2013; Meissner *et al.*, 2013).

According to Grafton *et al.*, (2011), cooperative water institutions, such as WUAs, should be of an appropriate size, comparable with their institutional capacity as well as available resources. New institutional economists argue that such institutions should operate within clear boundaries, with adequate financial and human capital resources (Ostrom, 1990; Bandaragoda, 2000; Agrawal, 2001; Dinar and Saleth, 2005; Grafton *et al.*, 2011). Notwithstanding, there seems to be a consensus among scholars of NIE that small water institutions with well-defined boundaries generally perform more effectively than large water institutions (Meinzen-Dick *et al.*, 2000; Pegram and Mazibuko, 2003; Fox, 2012).

4.8. Water policy: Equity considerations

Equity is one of the fundamental principles of the NWA (RSA, 1998). Addressing equity concerns through water policy in order to deal with skewed allocation which was a legacy of apartheid remains a paramount national priority. The NWRS (2012) strategy draws a distinction between 'equity in access to water services', 'equity in access to water resources' and 'equity in access to benefits from water resource use through economic, social and environmental development and management'. The concept and/or principle of equity in water provision is multi-faceted, the various but inter-related definitions are captured and discussed at length below.

Equity in access to water resources refers to the provision of reliable water supplies to various water users in the economy in accordance with the provisions for quality and quantity of the Water Services Act (RSA, 1997). Despite financial and infrastructural investment that has enabled the provision of water supplies to a mixed array of water users in the economy, there is still a sector of the population that lacks access to reliable water supplies and remains water insecure (NWRS, 2012 and 2013).

Equity in access to water resources refers to “the concept of direct access to water for productive purposes such as water for irrigating crops or water for a business or an industry” (NWRS, 2012: 22). Although it is socially ideal to allocate water resources in an equitable manner, it is practically impossible to allocate equal amounts of water to each person in South Africa (NWRS, 2012). Equity in access to water resources should be pillared on the productive usage of water resources and the benefits derived from water use such as poverty eradication, job creation, sustainable economic growth and overall reduction in socio-economic inequalities (Grafton *et al.*, 2011; NWRS, 2012; NWRS, 2013).

Lastly, equity in access to the benefits from water resource use refers to allocation of water resources in a manner that attains maximum benefits for all, either directly or indirectly (NWRS, 2012). According to Section 6(1)(b)(iv) of the NWA, most priority in water allocation is given to water uses that contribute to national economic growth and development (RSA, 1998). According to Brown (2013), in water-scarce countries, relative power relations within the society determine access to water resources as well as planning and management processes in the water sector.

Although the legislation and water policy of South Africa have been widely commended for being advanced and progressive with regard to their equity considerations, the water sector has over the years experienced significant challenges that have hindered the progressive attainment of the water sector’s equity objectives (DWA, 2012). Such challenges include inefficient internal organisation, management and integration, legislative and policy gaps, water authorisations under the control of whites and commercial farmers, unregulated trading of water use between parties, and lack of external integration and alignment with other enactments (DWA, 2008; NWRS, 2004 and 2013).

Despite having equitable water allocation as one of its core principles, the NWA has achieved minimal substantive progress in realising its objective of providing equitable water allocation across all races regardless of gender and location (DWA, 2011 and 2013). The DWA has established the water allocation reform (WAR) programme in an effort to redress disparities and inequities in the water sector (DWA, 2008; NWRS, 2013). Chapter 4 of the NWA outlines the general principles, essential requirements and considerations for

permissible water use in South Africa (RSA, 1998). This chapter is of key significance to the WAR programme (DWA, 2008).

The WAR programme proposes to achieve equitable water access through supporting resource poor and emerging farmers financially, compulsory licensing to promote equitable water allocations within catchments, and giving historically disadvantaged groups priority in licensing processes (DWA, 2013). According to the DWA (2004: 7), resource poor farmers are legal citizens of South Africa who are involved in farming activities and are “members of the historically disadvantaged population groups”. In 2004, the then Department of Water Affairs and Forestry (DWAF) formulated a rule to support the irrigation needs of poor farmers financially as per requirements of Sections 61 and 62 of the NWA. The rule was as follows:

$$R = \frac{1}{2} (F - C)$$

Where:

“**R** (%) is the percentage reduction in the total grant to the legal entity, with R always bigger than or equal to zero ($R \geq 0$);

F (%) is the percentage of the irrigated area on a scheme which is under the control of historically disadvantaged female decision makers/farmers, as reflected in the legal entity's official list of scheduled areas;

C (%) is the proportion of historically disadvantaged women on the management committee of the relevant WUA or other approved legal entity” (DWA, 2004: 8)

According to the rule, if the proportion of women in the management committee of the relevant WUA is equal to or more than the percentage of the scheduled area on a scheme driven by historically disadvantaged female decision makers and/or farmers, then no reduction in the total grant is applied (DWA, 2004).

The implementation of the rule as well as of the WAR programme has faced a number of challenges that have prevented the achievement of greater equity in water allocation for

historically disadvantaged groups. One of such challenges is lack of appropriate institutional arrangements (NWRS, 2012). Through the NWRS2, the DWA intends to intensify its working relations with the Department of Agriculture in order to ensure that both male and female historically disadvantaged farmers are given priority in the water reallocation process (NWRS, 2012). The DWA has appreciated that well-resourced and effective institutions with sufficient administrative authority are crucial for equitable water access (NWRS, 2013).

The formulation of WAR programme could be seen by institutional economists as a way of correcting the inefficiencies and unintended effects of path dependency and unequal power relations generated by existing institutions (March and Olsen, 1984; Hall and Taylor, 1996; Lawrence, 2008).

Over the years, a significant body of literature has emerged within NIE providing insights with respect to the relationships between power relations, path dependence and the operation of institutions (March and Olsen, 1984; Hall and Taylor, 1996; Bartley and Schneiberg, 2002; Stryker, 2004; Lawrence, 2008). New institutional economists argue that public or government institution sometimes reform public policies in an effort to achieve equity by taking a “sharp break from established procedures” (Williamson, 2000: 598). The sudden shift of the public policy to effect reform within a short space of time, often in less than a decade, is described as a “opening a rare window of opportunity” (Williamson, 2000: 598). However, it is common for such institutions to implement reforms within longer periods of time, often in phases divided by time, regions, and other measures (Williamson, 2000).

In South Africa, the post-apartheid water laws and policies created a window of opportunity for broader social inclusion in the water sector. However, the country has not fully taken advantage of the window of opportunity due to factors such as lack of greater public and stakeholder participation in the policy formulation and decision-making processes, and unutilised cooperation opportunities. Furthermore, the post-apartheid policy entrusts a resilient political and social agenda to local water management institutions, such as WUAs, without providing enforceable solutions required for balancing social equity and political obligations with their finances as well as embedded interests (Orne-Gliemann, 2008).

4.9. Water governance and Integrated Water Resource Management principles

The policies and legislation related to the water sector in South Africa are founded on the principles of Integrated Water Resource Management (IWRM) (NWRS, 2012). IWRM is a framework within which policy-makers try to move the skewed water reallocation towards greater equity (Haigh *et al.*, 2010). IWRM operates within various ideologies which reflect political philosophies as well as governance paradigms embraced by societies (Claassen, 2014).

Section 6(1)(l) of the NWA proposes that water resources need to be managed in an integrated manner in order to achieve efficiency, equity and sustainability in the water sector (RSA, 1998). However, there is no explicit mention of the IWRM in NWA of 1998. Nonetheless, the South Africa's NWA encompasses and endorses the 1992 Dublin Principles for Water Resources Management (Savenije and van der Zaag, 2002; Brown, 2013).

Integrated management requires the recognition of inter-linkages of water uses and the relationships that exist between water and the biophysical environment (RSA, 2000). The recognition of such relationships is argued to be a vital step in proper planning and informed decision-making processes in the water sector (RSA, 2000; NWRS, 2012). One of the key elements of the NWRS is the promotion of inter-sectoral and civil society partnerships and integrated governance in order to achieve good water governance (NWRS, 2004 and 2012).

The attainment of efficient and effective water management is dependent on good water governance (NWRS, 2013). Other elements of good water governance include accountability, wider participation, greater equity, ethical decision making, transparent operations, predictability, coherence and responsiveness to the needs of users (NWRS, 2012). The elements of good water governance outlined by the NWRS (2012), summarised in Figure 4.4, are in line with characteristics of effective water institutions discussed by New Institutional economists outlined in chapter 2 of this thesis (Saleth and Dinar, 2004; Gandhi and Crase, 2009; Shen and Speed, 2010; Ostrom, 2011). Ostrom (2011: 9) argues that some of elements of an effective common pool resource institution are, "(i) economic efficiency,

(ii) equity through fiscal equivalence, (iii) redistributive equity, (iv) accountability, (v) conformance to values of local actors, and (vi) sustainability”.

According to NIE, good governance consequently leads to effective and efficient institutional performance (Saleth and Dinar, 2004; Gandhi and Crase, 2009; Shen and Speed, 2010). However, new institutional economists argue that the proposed characteristics of effective water institutions in figure 2.2 are a principle, rather than a rule (Muller, 2006 and 2013). According to institutionalists, no two institutions are identical, hence it is practically impossible to propose a one-size-fits-all model for all institutions (Muller, 2006, 2008 and 2013).

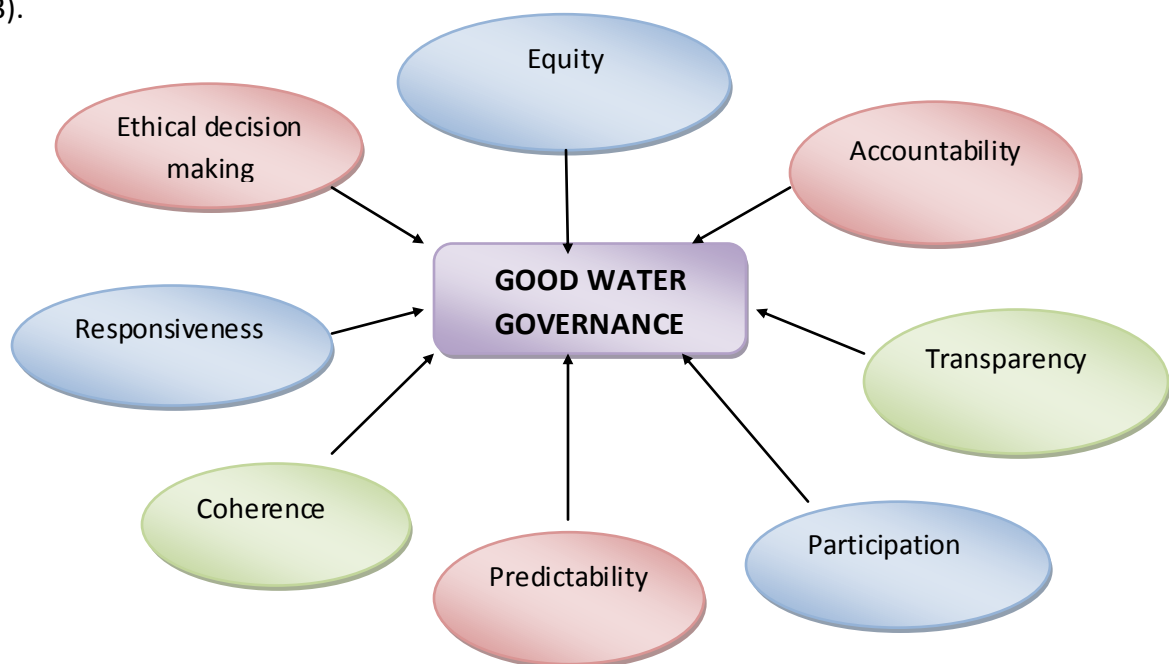


Figure 4.4: Elements of good water governance in South Africa. (Source: Adapted from NWRS, 2012)

Institutionalists argue that IWRM framework cannot fully address emerging challenges in the water sector such as; inefficiencies created by fragmentation and duplication of authorities, information asymmetries, lack of greater public and stakeholder participation in the decision making processes, and unutilised cooperation opportunities (North, 1997; Imperial, 2012). According to Imperial (2012: 5), contradictory “policies and priorities that work at cross purposes” often produce inefficiencies through embedded problems such as fragmentation and duplication of authorities and unutilised cooperation opportunities.

The NRWS of 2013 proposes that the National Water Policy of South Africa should be revised with emphasis and focus on the balancing of power among various stakeholders with dissimilar water interests and uses (NWRS, 2013). Furthermore, effectiveness of water institutions should form the core of the revised National Water Policy (NWRS, 2013). This will require extensive development of skills and expertise of relevant stakeholders and personnel in the water sector (Claassen, 2014).

4.10. New Institutional Economics and its applicability to water policy

Economists argue that neoclassical economic concepts and paradigms have influenced most policy formulation processes over the years (Berg and Tschirhart, 1995; Savenije and van der Zaag, 2002; Geradin 2006; Guthrie 2006; Lieberherr, 2009). They maintain that neoclassical economics' analytical tools and conceptual framework have played a pivotal role in the implementation of regulatory enactments, as well as in the design of optimum pricing of water resources (Berg and Tschirhart, 1995). Because of the neoclassical economics foundations of water resource allocation, in most developing countries such as South Africa, water policy has not yet yielded consistently desired results (Berg and Tschirhart, 1995; Savenije and van der Zaag, 2002; Grafton *et al.*, 2011; NWRS, 2013).

Proponents of NIE note that some of the under-achievements of the water sector are in part due to failure of the water policy to incorporate social norms, rules and behaviours of agents and the reliance on neoclassical economic paradigms of pricing strategies and production efficiency (North, 2000; Joskow, 2008; Lieberherr, 2009). Furthermore, they posit that the lack of achievement can be attributed to failure to recognise the interconnectedness of levels of economic institutions during the formulation and implementation stages of water policy (Williamson, 2000; Menard and Shirley, 2005; Joskow 2008; Brousseau and Glachant, 2008; Lieberherr, 2009).

According to NIE, there are four interconnected and interdependent levels through which the roles of economic, political, social and cultural institutions of economic activity can be

examined (Williamson, 2000; Menard and Shirley, 2005; Brousseau and Glachant, 2008; Lieberherr, 2009). Level 1, which is the uppermost level of the institutional hierarchy, consists of embedded or cultural institutions (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009). These institutions include informal institutions, norms, ethics, traditions, religion and customs that influence choices and individuals as well as the principles of the society (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009).

Level 2 outlines elements that make up the basic institutional environment (Brousseau and Glachant, 2008). These include formal institutions such as the constitutions, property rights, courts, law and other institutions that enforce the government's power to allocate and distribute water resources effectively, efficiently, sustainably and equitably (Williamson, 2000; Menard and Shirley, 2005; Brousseau and Glachant, 2008; Lieberherr, 2009).

The third level encompasses governance institutions (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009). Governance institutions are necessary for regulating the relationships between agents in the water sector in order to offset conflict, provide stability and to allow agents in the sector to maximise their gains at the least possible cost (Williamson, 2000; Lieberherr, 2009). Governance institutions vary from one country to the other, depending on the economic and political environment of the country at any given point in time (Williamson, 2000; Libecap, 2006; Brousseau and Glachant, 2008).

Lastly, level 4 comprises of institutions of resource allocation and employment creation (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009). These institutions allow for the daily operations of the economy given the preceding institutions encompassed by the other three levels (Glachant, 2008; Lieberherr, 2009). The levels are summarised in Figure 4.5.

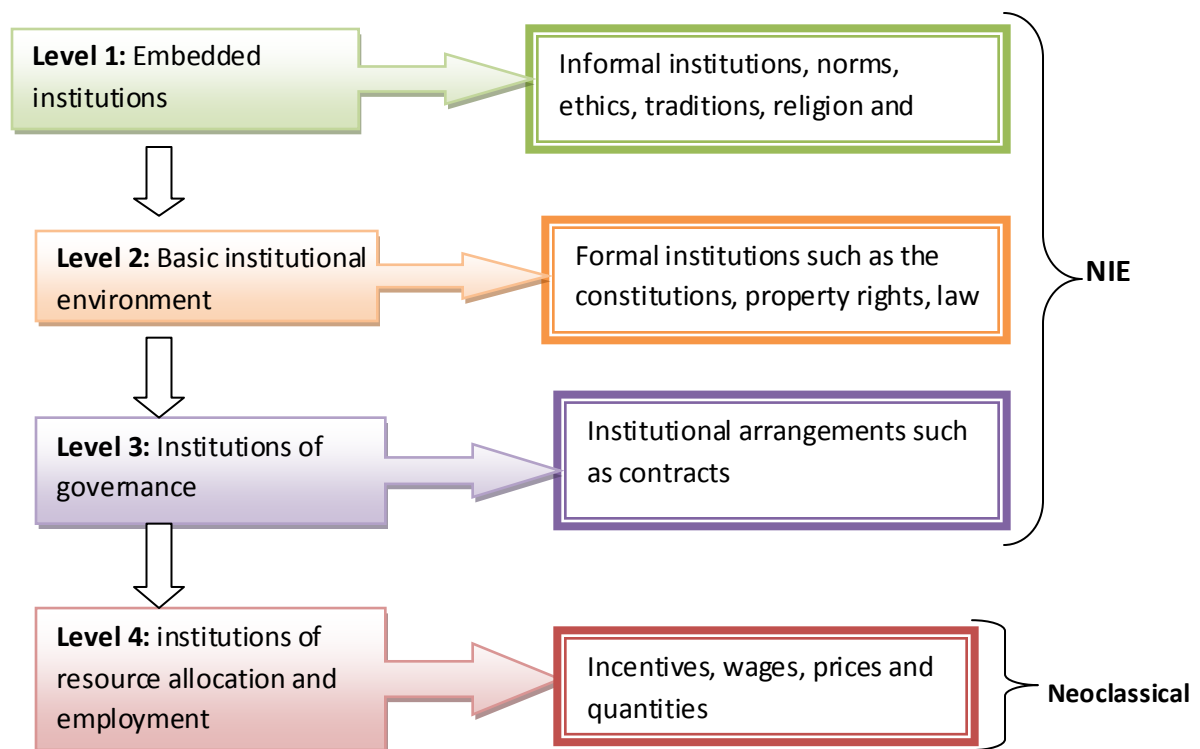


Figure 4.5: Levels of economic institutions. (Sources: Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009)

New institutional economists argue that level 4 is the “purview of neoclassical economics” (Lieberherr, 2009: 6), which focuses on derived outcomes of the institutional foundations laid by the first three levels. Their argument is that at this level, neoclassical market imperfections such as oligopoly and monopoly are used to determine incentives, wages, prices and quantities of water resources needed for allocation and conservation in the water sector (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009).

In South Africa, the government is regarded as a public trustee of water resources, hence it is afforded monopoly power and control over the country’s water resources (Conradie *et al.*, 2001; Stein, 2005). Section 56 (1) of the NWA allows the state to use price strategies to influence efficiency, sustainability, effectiveness and equity in water allocation (RSA, 1998). Neoclassical economists argue that “economic pricing of water will facilitate the re-allocation of water from sectors with lower added value (such as agriculture) to sectors with a higher added value (such as urban water use)” (Savenije and van der Zaag, 2002: 98). The NWA, through Section 6(1)(b)(iv), gives utmost priority in water allocation processes to

sectors that contribute to national economic growth and development such as commercial agriculture industry and mining sector (RSA, 1998).

Furthermore, given the current water resource allocation stipulated by the NWA and other policies in South Africa, it can be argued that there is potential prohibition of any reallocation, and consequently the policy will fail to accommodate the emergence of social and economic uses of water resources (Berg and Tschirhart, 1995; Libecap, 2006). Based on these arguments, it can hence be concluded that the water policy in South Africa is centred largely on neoclassical economics framework.

However, certain aspects of the policy embrace NIE principles in an effort to achieve optimal allocation of water resources even though they are mostly not implemented. This is in part due to the noticeable inertia displayed by some stakeholders, such as commercial farmers, who benefit from the status quo. In a study by Brown (2013), it was concluded that the potential of participatory institutions such as Catchment Management Agencies (CMAs) and WUAs, to achieve some of the social goals of national-level policies is rendered void due to the paralysis of the status quo and resistance of commercial farmers. Brown (2013) argues that the forms of resistance include commercial farmers in WUAs withholding payment, thereby threatening the financial viability of the WUAs. It can hence be argued that although the concept of IWRM proposed by water policy in South Africa, which appreciates the complexity and multi-sectoral characteristics of water, restrains the applicability of Neoclassical economic paradigms in water resource management, pricing based on market principles can undercut some of the social goals of national-level policies (Savenije and van der Zaag, 2002; Brown, 2013).

4.11. Conclusion

During apartheid, the Natives Land Act of 1913, which was informed by racial segregation, led to skewed distribution of natural resources (Thompson *et al.*, 2001; Nash, 2012). Riparian water rights made the apartheid era legislation exclusive as far as equitable water access is concerned because of the undisputable link between land ownership and access to water (Thompson *et al.*, 2001; Nash, 2012). Post-apartheid, the water legislation of South

Africa was reformed, resulting in the enactment of the Water Services Act of 1997 and National Water Act of 1998, which both call for participation of all stakeholders in the water sector as well as for equitable distribution of water resources for the benefit of all. The general aim of the NWA is to achieve greater equity between and within users groups, through greater cooperative governance and improved communication among all affected stakeholders (RSA, 1998).

South Africa's water policy is internationally regarded as progressive and forward thinking, as it is reflective of the broad aims of IWRM proposed by the 1992 Dublin Principles for water resources management (Saravanan *et al.*, 2009). However, the water sector in South Africa is still facing a number challenges, leading to a delay in achieving some of the goals of the post-apartheid water law (Muller *et al.*, 2005, Kuusi, 2009; Wegelin and Jacobs, 2013). The challenges can be attributed to policy and legislative gaps, water allocation driven by commercial farmers, among other factors. New institutional economists argue that the rapidly changing world, which entails emerging water uses, requires the appreciation of NIE economic principles such as participatory and integrated governance, as well as the recognition of social norms and customs in policy development.

Because the post-apartheid National Water Policy of South Africa is largely influenced by neoclassical economics foundations, the desired results in the water sector, such as equitable distribution of water resources, have not yet been fulfilled completely. Driving the implementation of the post-apartheid water policy towards equitable, efficient, effective and participatory management and allocation remains a challenge at local level as social norms and customs are not recognised.

The following chapter provides an analysis of the role of WUAs as common pool resource institutions in order to give a broad contextual backdrop within which WUAs operate.

CHAPTER FIVE

WATER USERS ASSOCIATIONS AS COMMON-POOL RESOURCE INSTITUTIONS

5.1. Introduction

Over the past five decades, a number of institutional arrangements have emerged globally in an effort to improve water management, increase effectiveness and efficiency in the water sector, and to promote poverty reduction gains associated with inclusive water allocation (Agrawal, 2001; Meinzen-Dick, 2007; Orne-Gliemann, 2008; van Steenberg, 2013). Such arrangements include water markets, government agencies and Water Users Associations (WUA) (Agrawal, 2001; Meinzen-Dick, 2007; Orne-Gliemann, 2008). The establishment of WUAs in some countries was a result of a need to curb the problems and challenges of a centralised system. Considerable variations in the nature and models of WUAs exist as local needs and realities have to be considered and incorporated when WUAs are established (Ostrom, 1990; Orne-Gliemann, 2008). In some countries, WUAs have failed to operate sustainably as they were given great responsibilities with limited resources, while other countries are success stories (Subramanian *et al.*, 1997; FAO, 1999; Faysse, 2004; van Steenberg, 2013).

This chapter provides an analysis of the motivation for WUAs and the challenges they are faced with. It will draw lessons from both the international and South African context, using New Institutional Economics (NIE) theories of common-pool resource management discussed in chapter 2, as well as institutional governance indicators discussed in chapter 3.

5.2. The need for Water Users' Associations

In most countries, water is regarded as a 'common-pool' or 'common-property' resource due to its scarce yet non-excludability characteristics (Ostrom, 1990; Pegram and Mazibuko, 2003; Hackett, 2011). The common-pool resource argument is often used to qualify the need for centralised regulation and management of water resources (Subramanian *et al.*, 1997; Pegram and Mazibuko, 2003; Perret, 2006; Wilson and Perret, 2010). However, managing water resources under a centralised system has been subjected to a number of

challenges (Subramanian *et al.*, 1997; Pegram and Mazibuko, 2003; Perret, 2006). Such challenges include: failure of markets, high transaction costs, failure to incorporate local needs and knowledge, creation of disincentives for conservation by local communities, and ineffective and inefficient overall management of water resources by the state (Ostrom, 1990; Subramanian *et al.*, 1997; Agrawal, 2001; Pegram and Mazibuko, 2003; Perret, 2006; Meinzen-Dick, 2007; Orne-Gliemann, 2008; Wilson and Perret, 2010; van Steenberg, 2013).

It is argued that a decentralised water management system is more likely to create incentives for conservation and general participation of the local communities in water management through the generation of distinctive intangible social capital for members (Aoki, 2001). The argument is that decentralisation creates a common sense of belonging, solidarity and social esteem. These are important elements needed for encouraging networking, building relationships and emphasising on negotiating and collective action (Aoki, 2001; Tropp, 2007). In the study on irrigation associations in Korea by Miyajim *et al.* (1992), it is shown how the lower income farmers in Korea, referred to as *yangban* and *nobi*, gradually colluded to pool resources and share ideas under an irrigation association. In 1930, the colonial government in Korea imposed an irrigation system, through a centralised setup on, the farmers (Miyajim *et al.*, 1992; Aoki, 2001). However,

“[T]he most effective system evolved in the area where the traditional irrigation associations had been active since the late Yi Dynasty, whereas the irrigation associations founded according to the legal stipulations of the colonial government ... had only a limited success” (Aoki, 2001: 57).

The case studies of Philippines, Indonesia, Sri Lanka, India, and Nepal follow a similar pattern. Meinzen-Dick (2007) argues that despite the limited resources of farmer-managed irrigation associations, the associations generally have better managed and cooperative structures and they contribute more to farm output compared to government-run irrigation associations. According to Meinzen-Dick (2007), the cooperation of farmers in large systems with rigid structures is often unsatisfactory. This is largely because such systems often fail to align their operations with the needs of farmers due to the imposition of top-down rigid hierarchy.

NIE argues that a centralised water management system may fail to adequately succeed in its mandate of providing water resources to all citizens at the least possible cost if the institutional arrangements in the water sector are weak and ineffective (Orne-Gliemann, 2008). These failures of the centralised water resource management systems are argued to have prompted a paradigm shift to decentralised water management strategies that are incorporate cooperative governance and a holistic regard for local governance structures (Subramanian *et al.*, 1997; Agrawal, 2001; Pegram and Mazibuko, 2003; Meinzen-Dick, 2007; Orne-Gliemann, 2008).

In essence, there is a need to implement policies that that incorporate both local realities and 1992 Dublin Principles for Water Resource Management, (hereafter referred to as the 'Dublin Principles'). One of the Dublin Principles requires integrated decision making on the allocation of scarce water resources - a shift away from top-down hierarchal water resource management (Van der Zaag and Savenije, 2000; Perret, 2006; Brown, 2013). Literature from disciplines such as economics, sociology, anthropology, as well as environmental and political sciences argues that a bottom-up approach to water resource management may be more likely to lead to desirable water management and conservation outcomes as it is could give the local communities a sense of ownership over their water resources (Wilson and Perret, 2010; Brown, 2013). In some countries, statutory bodies such as WUAs are established according to the specifics of operation outlined by water policy and law (Subramanian *et al.*, 1997; Agrawal, 2001; Pegram and Mazibuko, 2003; Meinzen-Dick, 2007; van Steenberg, 2013).

According to Pegram and Mazibuko (2003), WUAs are cooperative associations of water users established legally to govern decision-making processes towards a common goal related to sustainable water management for the benefit of all members. Generally, the main objective of WUAs is the maintenance of infrastructure in order to provide an uninterrupted and dependable water supply to water users (Subramanian *et al.*, 1997; Pegram and Mazibuko, 2003). In other countries, the objectives of WUAs may extend to issuing water licenses, provision of human capital development, and serving as overall consultants in the water sector (Subramanian *et al.*, 1997; Pegram and Mazibuko, 2003; van Steenberg, 2013).

In some of the areas in South Africa and other countries where WUAs operate, some advances such as increased agricultural activity, reduced transaction costs, enhanced service delivery, prompt system maintenance, and improved inclusion and empowerment of previously excluded and disadvantaged groups have been observed (Subramanian *et al.*, 1997; FAO, 2001; Pegram and Mazibuko, 2003; van Steenberg, 2013). Narain (2004) argues that the establishment of cooperatives in the form of WUAs often leads to a significant reduction of marginal costs for water management.

It is argued that WUAs perform better where centralised governance is less effective than local governance (Pegram and Mazibuko, 2003; van Steenberg, 2013). Their effectiveness and sustainability is also dependent upon the nature of activities that members have selected as their focal point (FAO, 2001). Furthermore, some researchers posit that the success of WUAs is determined by an amalgamation of factors such as the nature of their internal structures, external conditions within which they operate, as well as local and technical considerations (Subramanian *et al.*, 1997; Pegram and Mazibuko, 2003; Fox, 2012; van Steenberg, 2013).

The external conditions alluded to above that influence the outcomes of WUAs include among others; the governing policies and legislation of the country, the structure of agencies interacting with the WUA, physical infrastructure, socio-economic factors such as market penetration (World Bank, 1996; Subramanian *et al.*, 1997; Meinzen-Dick *et al.*, 2000; Pegram and Mazibuko, 2003; Fox, 2012; van Steenberg, 2013). Scholars of NIE argue that the governing policies and the legislature of the country are some of the crucial elements that define the country's political economy (Adhikari, 2002; Duncan, 2003). According to NIE, the political economy plays a pivotal role in the overall resource management (Adhikari, 2002). The clarity of the governing policies and laws in any given jurisdiction often leads to increased certainty about expected returns to be accrued from the natural resource within a given period of time, as well as to the creation of resource conservation incentives (Sanderson, 1994; Adhikari, 2002).

On the other hand, internal conditions have been identified to be; the size and scope of the WUA, membership definition, the age of the WUA, as well as leadership roles provisions of

the WUA (World Bank, 1996; Subramanian *et al.*, 1997; Meinzen-Dick *et al.*, 2000; Pegram and Mazibuko, 2003; Fox, 2012; van Steenberg, 2013). New institutionalists unanimously argue that institutional environments, arrangements and landscapes give each institution a distinct identity and contribute to institutional diversity (Agrawal, 1999; Aoki, 2001; Ackerman, 2004; Orne-Gliemann, 2008; Menard and Saleth, 2011).

Notwithstanding, there seems to be a consensus among scholars of NIE that small water institutions with well-defined boundaries generally perform effectively (Meinzen-Dick *et al.*, 2000; Pegram and Mazibuko, 2003; Fox, 2012). Furthermore, it is argued that WUAs which were formed from previously efficient and effective irrigation associations, with qualified and knowledgeable leaderships are more likely to be effective (Meinzen-Dick *et al.*, 2000; Pegram and Mazibuko, 2003; Fox, 2012).

A significant body of research raises questions about the effectiveness and efficiency of WUAs with regard to finding a balance between improving equitable allocation amongst all members (Shah *et al.*, 2002; Mukherji *et al.*, 2009; International Water Management Institute (IWMI), 2011). According to the IWMI (2011), the questions reflect a deficiency of a rigorous and extensive assessment linking institutional performance to existing policies (IWMI, 2011). They also serve as a reflection of the complexity of duplicating institutions from one context to the other (Meinzen-Dick, 2007; IWMI, 2011).

5.3. The definition of Water Users' Associations in South Africa

Subsequent to the attainment of democracy, a legislative appraisal and reform in the water sector resulted in the formulation of the NWA (Act 36 of 1998) and the 1997 White Paper of a National Water Policy for South Africa (RSA, 1997). These set out the rules and requirements for water resource management and allocation, and provide imperatives for the establishment of WUAs and other water management institutions. In South Africa, WUAs are water management legislative bodies established by the Minister of Department of Water Affairs (DWA) under Section 92 of the NWA of 1998 (RSA, 1998; Pegram and Mazibuko, 2003; Brown, 2011). Historically, Irrigation Boards, which were generally governed by white people, represented the interests of commercial farmers (National

Department of Agriculture, 2001; Mokgope et al., 2001; Brown, 2011; Nash; 2012). The enactment of the NWA subsequently called for the transformation of Irrigation Boards into more inclusive WUAs (Brown, 2011; DWA, 2013).

The NWA further outlines the basic categories of entitlement to use water, which are; schedule 1, general authorisation, water use licenses and existing lawful water use (RSA, 1998; Pegram and Mazibuko, 2003). According to Section 4(1) of the NWA, schedule 1 provides for the use of water resources for purposes such as gardening, fire-fighting, domestic use, animal watering and recreational use (RSA, 1998). Section 39 provides general authorisation provisions under which water use does not require a license, while section 41 outlines water uses that are subject to compulsory licensing (RSA, 1998). Section 33 of the NWA acknowledges water uses that existed prior the introduction of the NWA (RSA, 1998). According to Pegram and Mazibuko (2003: 4), “any group of water users associated with any of these categories may be members of (or represented on) a WUA”.

5.4. The functions of Water Users’ Associations in South Africa

The NWA has listed a range of principal functions to be performed by the WUA in schedule 5, item 4. These are:

- “To prevent water from any water resource being wasted
- To protect water resources
- To prevent any unlawful water use
- To remove or arrange to remove any obstruction unlawfully placed in a watercourse
- To prevent any unlawful act likely to reduce the quality of water in any water resource
- To exercise general supervision over water resources
- To regulate the flow of any watercourse
- To investigate and record the quantity of water at different levels of flow in a watercourse; the times when; and the places where water may be used by any person entitled to use water from a water resource.

- To construct, purchase or otherwise acquire, control, operate and maintain waterworks.
- To supervise and regulate the distribution and use of water from a water resource” (RSA, 1998).

The Act, however, makes provisions for WUAs to select a range of their intended functions from the list, and/or to propose their own set of functions upon registration (RSA, 1998). The proposed functions of WUAs have to be strongly consistent with the visions and interests of respective members of the associations (DWFA, 2001). For example, while the Thabina WUA in Limpopo Province has conflict resolution mechanisms between users with competing interests as one of its functions, the LSR-WUA in the Eastern Cape Province does not (LSR-WUA, 2004; Orne-Gliemann, 2008).

Similarly, one of the ancillary functions of LSR-WUA is to be financially prudent (LSR-WUA, 2004), but this has not been explicitly listed as one of either Thabina WUA or eDikeni WUA’s key supplementary functions (LSR-WUA, 2004; Orne-Gliemann, 2008; Kapfudzaruwa and Sowman, 2009). It is, however, important to note that some WUAs perform additional duties other than the ones listed in their respective constitutions. For instance, in a study by Orne- Gliemann (2008), it was revealed that the Thabina WUA performs the role of training emerging farmers even though such a role did not appear in the list of its functions.

In addition to the proposed principal functions, according to schedule 5, item 5 of the NWA, WUAs should also perform ancillary functions, such as the provision of training and management services for water service institutions and rural communities, as well as provision of catchment management serves (RSA, 1998). Ancillary functions, however, should only be performed by WUAs mandated to perform the water services functions and with the resource capacity sufficient for the successful execution of their principal functions (RSA, 1998; Pegram and Mazibuko, 2003).

5.5. Challenges faced by Water Users' Associations in South Africa

Some scholars argue that, although the WUA model proposed by the post-apartheid government is ideal with noble intentions, the expectation of achieving equitable water allocation through participation is unrealistically optimistic (Hickey and Mohan, 2004; Swyngedouw, 2006; Brown, 2013). Such scholars argue that some of the stakeholders in the water sector, such as commercial farmers, have always had vested interests which are difficult, if not impossible, to change (Hickey and Mohan, 2004; Swyngedouw, 2006; Brown, 2013). As argued by Sehring (2009: 65), "The reason for the genesis and persistence of institutions is ... not only that they perform a certain function, but also that they serve certain interests." By implication, the interests of the powerful stakeholders "whether or not they always prevail, are taken into account" (Roy, 1981: 1289), on decisions that affect such stakeholders in the present.

According to the DWA (2013), the lack of cooperative partnerships and required engagements between the South Africa Association for Water User Associations (SAAFWUA) and the DWA presents a communication challenge that extends to individual WUAs. The aim of SAAFWUA is to give the WUAs the necessary support through working closely with the DWA in order to address challenges that are constraining WUAs from performing effectively and efficiently (SAAFWUA, 2013). However, the degree of engagement between the DWA and the SAAFWUA is not yet satisfactory (DWA, 2013). For instance, the SAAFWUA was not consulted during the policy review process. In its response to the DWA concerning the NWPR of 2013, SAAFWUA (2013: 3) cited its three main reasons for opposing the implementation of Policy changes as follows;

- "a) The time frame and notices to the water users were insufficient;
- b) The way some of the consultations were done, did not enable the attendees to make proper inputs. It was handled more like information transfer sessions and most of the statements were based on wrong perceptions and unfounded allegations; and
- c) At some of the Regional sessions the Regional Head even informed the stakeholders that the decision to implement the policy position with specific reference to Water Users Associations that will cease to exist has already been made by Government."

Khosa (2003) and de Coning and Sherwill (2004) argue that the lack of intensive consultative process on policy formulation and policy reviews often leads to unintended negative impacts during policy implementation processes. Although the relationship between policy-making and implementation is generally complex and multi-facet, it argued that miscommunications, lack of consultation and fragmented relationships between various stakeholders often lead to deficiencies in policy implementation (Khosa, 2003; de Coning and Sherwill, 2004). According to the former president of South Africa, Thabo Mbeki (2002),

“The policy is there, the institutions are there. The critical matter to address is: are they functioning? It is not a matter of changing policies, but to ensure their implementation.”

It can be argued that some of the challenges faced by WUAs in South Africa are influenced by the theoretical foundations within which the National Water Policy is founded. As argued in the previous chapter, in South Africa, water policy and allocation mechanisms are largely influenced by neoclassical economics principles, principally in attaining efficiency through pricing and incentive-enhancing measures, including allocation and transferability of property rights (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009).

In light of the above, it follows, therefore, that water policies and/or allocation mechanisms based solely on neoclassical assumptions are likely to be inefficient and inequitable. As noted by North (1997), governments often fail in their duty of securing contracts and protecting property rights. In the same vein, it can be argued that some WUAs are struggling to achieve efficient and equitable water allocation in part due to the influence of national level water policies and their bias towards neoclassical principles. However, in South Africa, the National Water Policy narrowly embraces property rights with regards to water (Stein, 2005).

The policy also entrusts a strong political agenda to WUAs in their role as one of the local water management institutions expected to redress apartheid era inequities (Stein, 2005; Orne-Gliemann, 2008). As noted by Orne-Gliemann (2008), the question that emerges is: are WUAs, already impeded by historical legacies, able to perform and conciliate these multiple objectives, (including implementation of IWRM, promotion of community participation and

advancement of the political agenda) given the vested interests and power relations inherited from their previous organisations? Institutional economists argue that local self-governance, where CPR management is led by local communities, with little or no political interference, local institutions operate more efficiently, monitor resources better and resolve conflicts more effectively (Ostrom, 1990; Bromley, 1992; Sethi and Somanathan, 1996; Hackett, 2011).

5.6. Path dependency and governance of Water Users' Associations

As discussed in chapter 2 of this thesis, neoclassical and NIE argue that institutions are carriers of history (Streeck and Thelen, 2005; Heinmiller, 2009; Sehring, 2009). It is argued that understanding institutional change is not only dependent on linking the path of history to the present and the future, but it is also reliant on the unravelling of power plays that shaped the institutions in the past (Streeck and Thelen, 2005; Heinmiller, 2009; Sehring, 2009). The path dependence feature of institutions is one of the reasons why no particular institutional arrangement would be efficient or at least functional in all contexts (Sehring, 2009; Saleth and Menard, 2011).

Commercial farmers in both transformed and existing irrigation boards have invested many resources in influencing the shape of their boards, as well as playing a crucial role in proposing a set of duties to be carried out by their respective CMAs and consequently WUAs (Brown, 2013). The NWA mandates CMAs with the responsibility of regulating and controlling water supply in a way that ensures socio-economic development for all (RSA, 1998). Furthermore, CMAs are responsible for ensuring sustainable water use through cooperative governance (RSA; 1998). However, the institutional framework through which CMAs and WUAs operate, and the current understanding of cooperative governance in South Africa's water sector remain complex (Boyd and Tompkins, 2011). Furthermore, structures that allow for accountability of CMAs and WUAs remain vague (Boyd and Tompkins, 2011; Brown, 2013). As Brown (2013: 277) argues,

“In a seeming paradox of participation, reform-oriented central government officials assume the role of countervailing power to white farmers. This regulatory role

requiring continual, but justifiable, interventions by central government officials makes a mockery of the decentralized participatory ethos.”

Moreover, where WUAs are tasked with water service delivery functions in accordance with requirements outlined by the Water Services Act (RSA, 1997), the complexity of accountability of WUAs arises (Thompson *et al.*, 2001; Pegram and Mazibuko, 2003; Haigh *et al.*, 2010). Furthermore, although South Africa’s water policy has succeeded in describing how WUAs should be defined within a water resource management framework, questions on how WUAs should link with other institutions within the broader Integrated Sustainable Rural Development Strategy (ISRDS) remain unanswered (DWFA, 2001; DWA, 2013).

5.7. External factors that affect effectiveness, efficiency and viability of Water Users Associations

It is argued that the effectiveness, efficiency and the general success of WUAs in South Africa is partly dependent on the external environment within which WUAs operate (Pegram and Mazibuko, 2003). The operations of the WUA are influenced by the external institutional relationships such as water policy, catchment management agencies (CMAs), and water service authorities (WSAs), among others. The types of external institutional relationships can be divided into four broad categories, namely statutory, representative, contractual and cooperative relationships (Pegram and Mazibuko, 2003).

Statutory relationships are essentially those governed by the NWA (Pegram and Mazibuko, 2003). As stated in the NWA, the WUAs are established and monitored by CMAs and the Minister responsible for DWA (RSA, 1998). In essence, DWA and CMAs are responsible for the provision of financial support, delegation of functions, provision of suitable training and conflict resolutions for WUAs (RSA, 1998; Pegram and Mazibuko, 2003). In the absence of CMAs in water management areas, the DWA regional office (DWA-RO) is tasked with the responsibility of performing catchment management duties (DWFA, 2001 and 2003; Clifford-Holmes *et al.*, 2013).

Representative relationships consist of interactions between the management committee of the WUA and its respective members, as well as the representation of the WUA on institutional bodies such as catchment forums (Pegram and Mazibuko, 2003; Clifford-Holmes *et al.*, 2013). Where WUAs perform water service provider (WSP) duties and act as the Water Service Authority (WSA), contractual relationships are a necessity. According to NIE, contracts are not only essential for dictating the relationships between entities, but also for improving the quality of services exchanged between parties (Brousseau, 2008; Mihau *et al.*, 2008).

The Water Services Act governs the decisions of the WUA that acts as a WSA (RSA, 1997). Cooperative relationships may emerge between the WUA and various local government, civil society, private sector, government departments and international bodies (DWFA, 2001 and 2003; Pegram and Mazibuko, 2003; Clifford-Holmes *et al.*, 2013). The fundamental institutional relationships are indicated in Figure 5.1 as follows;

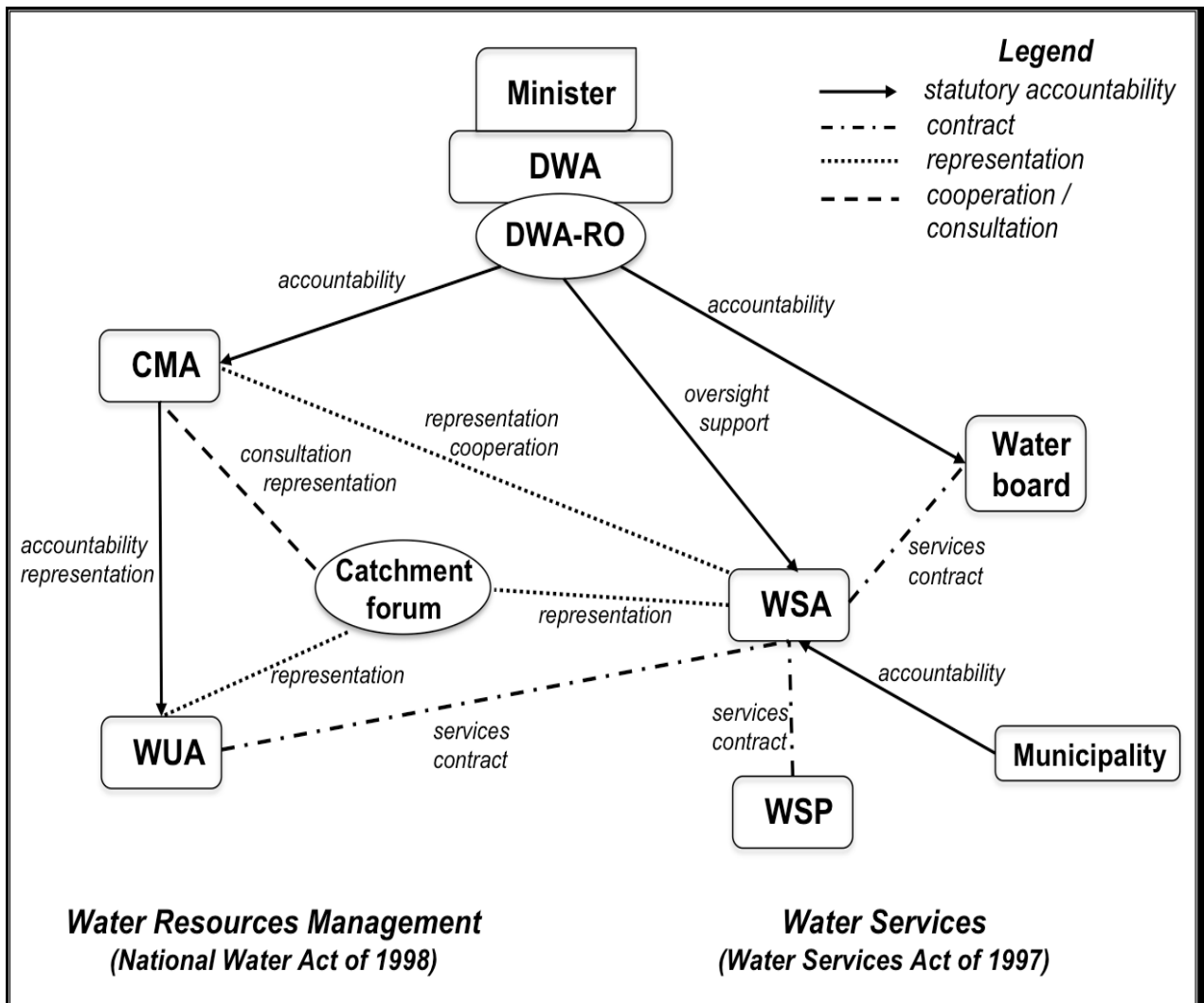


Figure 5.1: Primary institutional relationships between various water sector institutions. (Sources: Adapted from Pegram and Mazibuko, 2003; Clifford-Holmes *et al.*, 2013)

5.8. New Institutional Economics and common pool resource management

Generally, WUAs are not only important for managing and regulating common pool resources in order to avoid overexploitation, but also for attaining a more equitable and sustainable water resource allocation and management (North, 1990; Bandaragoda, 2000; Agrawal, 2001; Lipecap, 2008). New Institutional economists argue that effective collective action institutions are necessary for internalising the consequences and externalities of individual actions regarding common pool resource use (Libecap, 2008; Brousseau and Glachant, 2008). According to Ostrom and Gardner (1993: 93),

“If exclusion is not accomplished by the design of appropriate institutional arrangements, free-riding related to the provision of the common-pool resource can

be expected. After all, what rational actor would help to provide the maintenance of a resource system, if non-contributors can gain the benefits as well as contributors.”

In South Africa, WUAs as management institutions, have vested powers and obligations to prevent unlawful water use, protect water resources, safeguard and promote environmental and water resource conservation, as well as to exercise any management powers and functions assigned to them by the NWA. Some NIE scholars suggest that instituting rights and powers of use, access, exclusion and/or inclusion, management and transferability could lead to more equitable and sustainable common pool resource allocation and management (North, 1990; Bandaragoda, 2000; Agrawal, 2001; Lipecap, 2008).

It can be argued that, theoretically, WUAs are more effective in ensuring efficient and equitable water allocation than instituting rights from a centralised organisation. It can further be argued that WUAs management strategies often tend to be more responsive to the needs of local residents. These propositions are largely premised on the argument that, “regulated common property and private property are equivalent from the stand point of the efficiency of resources use” (Baland and Platteau, 1996: 175), hence establishing property rights and powers over common pool resource use could lead to efficient resource use (Agrawal, 2001; Lipecap, 2008; Kirsten *et al.*, 2009). This argument is in agreement, though to a limited extent, with neoclassical economic theory, which posits that assigning of property rights leads to proper allocation and management common pool resources (Williamson 1998; Hodgson 1998; Saleth and Dinar, 2004).

Although cooperative governance, in the form of WUAs, allows for the creation of mutual trust between members, it cannot guarantee a complete elimination of opportunistic behaviour of members within the group, nor can it ensure sustainability, equity and efficiency in common pool resource allocation. This assertion is premised on the argument that there is no definite widely accepted set of factors that contribute to efficient, equitable and effective cooperative governance in NIE (Wade, 1988; Ostrom, 1990; Ostrom *et al.*, 1994; Bandaragoda, 2000; Agrawal, 2001; Lipecap, 2008). Scholars, however, have identified a range of conditions necessary for efficient and sustainable common pool resource

management (Ostrom, 1990; Agrawal, 2001; Grafton *et al.*, 2011). Such conditions are related to resource community characteristics and rules-in-use, which in turn affect the interactions and outcomes within the resource allocation sphere. Figure 6.2 applies the IDA framework discussed in chapter 2 by outlining some conditions necessary for efficient, effective and equitable institutional governance. The conditions are an extension of the principles necessary for robust institutions discussed in chapter 2.

Attributes of community include size, power relations dominant with the groups, path dependence influenced by past successful experience, among other characteristics (Wade, 1988; Ostrom, 1990; Ostrom *et al.*, 1994; Bandaragoda, 2000; Agrawal, 2001; Lipecap, 2008). However, the definition of these characteristics is relative to the case in question. They are used to serve as basic requirements and not as a way of redressing substantive institutional issues. As argued by Agrawal (2001: 1654), "... we have to contend with the possibility that the enterprise of attempts to create a list of critical enabling conditions that can apply universally can founder at a very basic epistemological level".

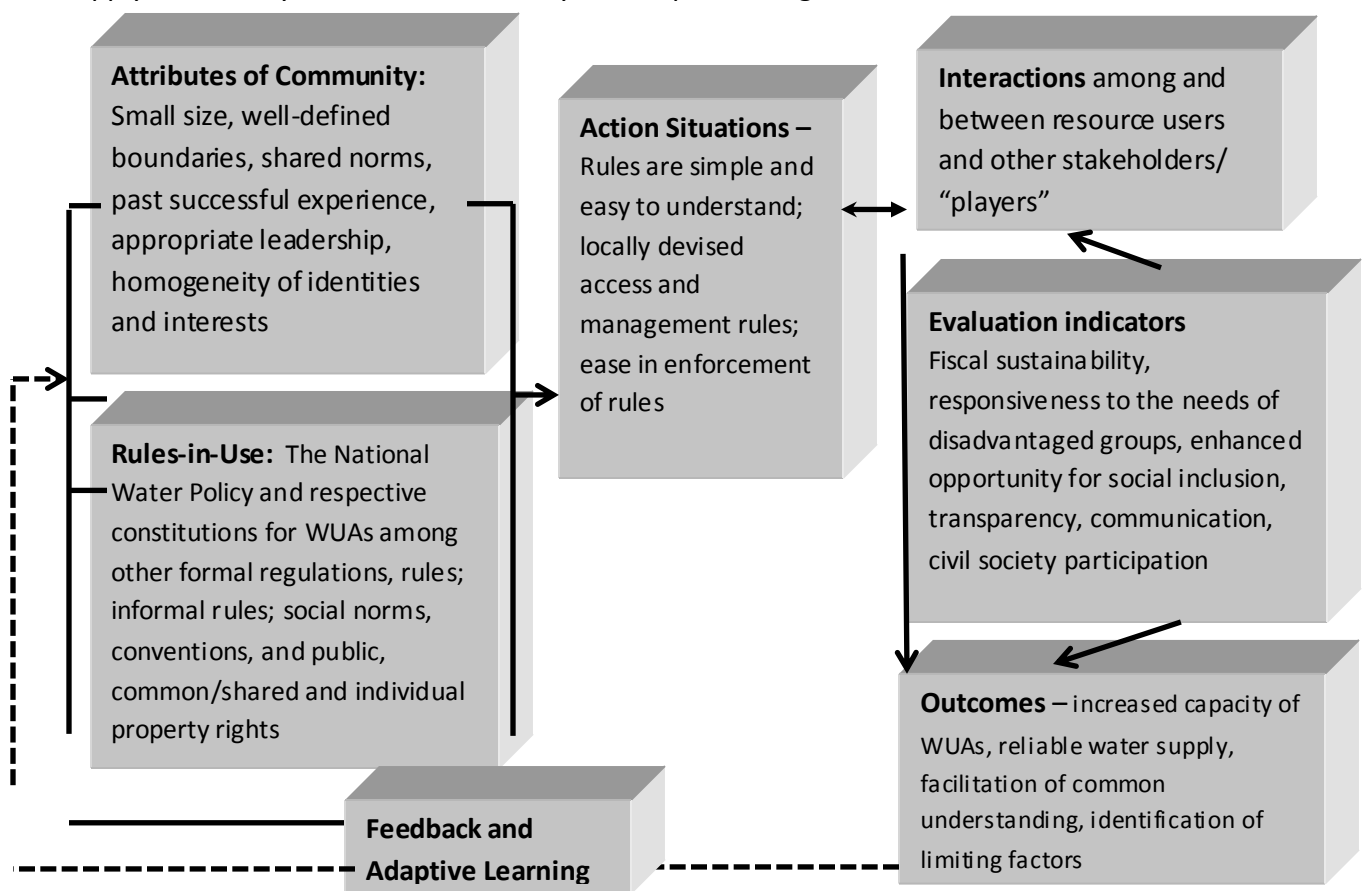


Figure 6.2: Institutional Analysis and Development (IAD) Framework. (Source: Ostrom, 2009)

In a nutshell, according to NIE scholars, gauging the success of WUAs in terms of efficiency, effectiveness and equity necessitates the amalgamation of several indicators (Saleth and Dinar, 2004; Dinar and Saleth, 2005; Grafton *et al.*, 2011). According to Grafton *et al.*, (2011), cooperative water institutions, such as WUAs, should have well-defined institutional relations both internally and externally. New institutional economists further argue that such institutions should operate within clear boundaries with adequate financial and human capital resources (Ostrom, 1990; Bandaragoda, 2000; Dinar and Saleth, 2005; Grafton *et al.*, 2011).

New institutional economists argue that the processes of institutional evolution and cooperative governance do not guarantee efficiency (Narain, 2004; Robin and Staropoli, 2008; Brousseau and Glachant, 2008). Their argument is that some institutions are inefficient, despite their underlying cooperative principles (Narain, 2004; Robin and Staropoli, 2008; Brousseau and Glachant, 2008). This is partly due to selection failures, and largely because institutions are faced with numerous yet coordinated equilibria which do not necessarily lead to attainment of efficiency (Brousseau and Glachant, 2008).

5.9. Conclusion

This chapter analysed WUAs as one of the institutional arrangements needed to ensure effective and efficient management of water resources. Over the years, the debates on suitable water management strategies have shifted from a technical approach that focused mostly on engineering capabilities to an integrated approach which recognised the interconnectedness of water resources, water policies and human behaviour, and appreciates the need for cooperative governance (Orne-Gliemann, 2008; Wilson and Perret, 2010; van Steenbergen, 2013). New institutional economists argue that the externality principle reflects opportunistic and rent-seeking behaviour of economic agents. Therefore, cooperative governance is one of the strategies of internalising the effects of externalities (Dinar and Saleth, 2005; Lipecap, 2008; Brousseau and Glachant, 2008; Kirsten *et al.*, 2009).

In some countries, WUAs were established to serve as engines through which problems and challenges faced by the centralised system could be curbed, while in others they were

established to form a necessary pool to cushion farmers from the general risks of farming (Miyajim *et al.*, 1992; Aoki, 2001). Significant variations of the nature and models of WUAs exist as local needs and realities have to be considered and incorporated when WUAs are established.

Although considerable theoretical efforts have been made to establish conditions necessary for effective and efficient operations of WUAs in South Africa, some WUAs are faced with challenges that hinder their efficiency effectiveness and equity. Therefore, there is a need to direct efforts to determining how WUAs can perform efficiently, equitably and effectively in practice.

The following chapter provides an extensive description of research methods used in this study.

CHAPTER SIX

RESEARCH METHODS

6.1. Introduction

This chapter explains the research methods that were used to address research questions of this thesis. The rationale for selecting certain research methods is also addressed in this chapter. The application of NIE theory methods to data collection and analysis are explained. The study utilised mixed methods and data types. The various methods employed include interpretive and post-positivist paradigms, quantitative and qualitative research, the case study research method and in-depth key informant interviews. The study used both secondary and primary data sources.

6.2. Post-positivist and interpretive research paradigms

Despite the predominance of the positivist research approach in economic research, this study assumes a post-positivist research approach. Positivism assumes that the data and analysis used in a research are value-free (Healy and Perry, 2000; Krauss, 2005). As stated by Krauss (2005: 759),

“In the positivist paradigm, the object of study is independent of researchers; knowledge is discovered and verified through direct observations or measurements of phenomena; facts are established by taking apart a phenomenon to examine its component parts.”

Essentially, the positivist research paradigm dictates that the researcher should use quantitative data and economic assumptions to view the world through a “one-way mirror” (Healy and Perry, 2000: 119). The extensive use of various sources of qualitative data such as opinions of key informants, data collected by Clifford-Holmes in his doctoral study entitled “*A transdisciplinary investigation of water governance in the Lower Sundays sub-catchment of South Africa*”, financial and annual reports, among other sources, necessitated the use of post-positivist approach in this study. Clifford-Holmes collected both qualitative and quantitative data through conducting fieldwork in the LSRV catchment between

October 2011 and August 2013. The data was collected using various data collection techniques such as documentation, semi-structured interviews, direct observation and participant observation. The participants of his study included staff and councillors of the SRVM, staff of the LSR-WUA, officials from the Regional Office (RO-DWA), engineers from the regional water Board of Eastern Cape, and residents, farmers and community groups within the SRVM. Farmers interviewed were predominantly commercial farmers.

Post-positivist research supports “methodological pluralism” (Wildemuth, 1993: 451) largely because it acknowledges that there is no particular flawless scientific method (Wildemuth, 1993). Post-positivists, therefore, intensively investigate case-studies with close reference to the research questions, in order to illustrate path dependencies, contexts and values that define the current state of institutions (Wildemuth, 1993; Henderson, 2011; Sharp *et al.*, 2011).

The interpretive research paradigm is necessary for disentangling extant institutions, organisations and relationships in order to deal with social realities (Patton, 2002). The paradigm descriptively analyses a social phenomenon using mostly qualitative data (Neuman, 2000). One of the fundamental assumptions of interpretive research is that the various social factors led to the existing realities of institutions, and the researcher’s role is to reveal the realities through providing insights into the complex social institutions (Cavana *et al.*, 2001; Andrade, 2009).

Given the need to explore institutional governance within the Lower Sundays River Water Users Association (LSR-WUA) and its influence on equity and efficiency in allocation of water resources, fusing post-positivist and interpretative paradigms in this study was necessary (Henderson, 2011; Sharp *et al.*, 2011). Institutional governance and institutional framework analysis formed the fundamental foundation of this study, enabling the exploration of relevant governance dynamics and mechanisms in the water allocation and distribution process (Henderson, 2011; Lee and Cassell, 2013).

6.3. Mixed research method

According to Creswell (2012), mixed methods in research entail using a diverse mix of procedures for collecting, analysing both qualitative and quantitative data and methods within a single study to address research questions. The mixed methods approach has the advantage of providing a comprehensive analysis of the research problem where one particular method or data type cannot address the study's indicators fully (Creswell, 2008 and 2012). The study used a multi-method data gathering approach to minimise flaws and to increase the accuracy of research results (Brewer and Hunter, 2006). Patton in Oosthuizen *et al.* (2005:72) argues that, "By using a combination of observations, (e.g. interviewing and document analysis) the field worker is able to use different sources to validate and crosscheck findings".

6.3.1. Quantitative research

Quantitative research uses quantifiable data from primary and/or secondary data sources and statistical descriptions to analyse the numbers and conduct a social inquiry with minimal bias (Creswell, 2008 and 2012). In this study, certain indicators of efficiency prompted the use of quantitative data. The main sources of quantitative data for this study were the LSR-WUA's annual financial reports for financial years 2008/2009, 2009/2010, 2010/2011 and 2011/2012. These reports were obtained from the LSR-WUA's official website – www.sundaysriverwater.co.za. They were all prepared by external auditors to avoid bias (LSR-WUA, 2008, 2009, 2010, 2011 and 2012).

The financial reports were used to examine the financial balances and fiscal sustainability of the LSR-WUA in order to evaluate the association's efficiency in its operations. Analysing efficiency in terms of trends in expenditure and income necessitated the use of quantitative data. The use of expenditure and income served as measures of allocative efficiency. The data were inflated to current 2014 prices using the Producer Price Index (PPI) provided by Statistics South Africa.

6.3.2. Qualitative research

Although there were quantitative elements of the study, it was largely qualitative. A qualitative approach enabled the research to conduct an in-depth social and institutional inquiry (Patton, 2002; Ramsden, 2002). According to Patton (2002), qualitative research methods are crucial for addressing “how”, “what” and “why” research questions. This study aimed at exploring the links between institutional governance, equity and efficiency in allocation and management of water resources, with reference to institutional and resource economics paradigms. It also analysed the role of the existing institutional and water governance arrangements in the LSRV in influencing efficiency and equity of water allocation in the catchment. These exercises required a narrative approach using literature and document analysis in order to provide an insight into the economic and institutional history of the LSRV.

According to Bowen (2009), document analysis is a methodical technique for studying or evaluating both electronic and printed documents. In this study, data were explored and examined using various themes related to the research area, topic and research questions. This exercise was essential eliciting meaning as well as for providing a broader understanding of the research area.

It is argued that document analysis is generally used in consolidation with other qualitative research methods as a means of triangulation (Bowen, 2009). Triangulation is defined as “the combination of methodologies in the study of the same phenomenon” (Denzin, 1970: 291). Data triangulation helps to provide “a confluence of evidence that breeds credibility” (Eisner, 1991: 110). Several scholars argue that document analysis is often a preferred method applicable to qualitative case studies (Stake, 1995; Yin, 1994; Bowen, 2009), due to its ability to reveal meaning, improve understanding and determine insights relevant to the research (Merriam, 1998; Bowen, 2009).

A broad range of literature and/or documents, such as water policy documents for the Republic of South Africa, reports, books, journal articles, maps and charts and survey data, among others. The influence of economics on the current institutional and governance

arrangement in the LSRV was investigated through both the selection of appropriate institutional frameworks using the literature, and the application of the framework to the institutional and governance analysis of the work of Clifford-Holmes (forthcoming) and Clifford-Holmes *et al.* (2013). Administrative documents from the LSR-WUA, national, provincial and local government documents, maps of the geographical area, as well as the LSR-WUA website provided data used for analysis in this study.

The analytical framework to study path dependency and power relations in connection with the water distribution reform particularly in the LSR-WUA was drawn from a literature review of transition studies and NIE.

6.4. Social learning and transdisciplinarity

This research is part of a broader transdisciplinary research body from which data was largely drawn. Transdisciplinary research transgresses boundaries between various disciplines and affords the podium through which researchers transcend their own disciplines to “inform one another’s work, capture complexity, and create new intellectual spaces” (Gehlert, 2010). According to Patterson *et al.* (2013), transdisciplinarity is increasingly being embraced as a way of analysing wicked problems. Wicked problems are defined as those problems that are multifaceted and multilayered, which often result in unexpected effects and some degree of uncertainty when tackled (Rittel and Webber, 1973; Hearnshaw *et al.*, 2011). These problems include water allocation, distribution, management and governance issues (Hearnshaw *et al.*, 2011).

The researcher worked closely with researchers from the Institute for Water Research (IWR) who had conducted various studies in the LSRV and were knowledgeable about the study area. As part of the social learning process, the researcher attended monthly transdisciplinary (TD) research group meetings. The meetings provided a platform within which researchers working on water related issues from different disciplines shared ideas, case study facts and references. Through the TD meetings, an environment characterised by rich network of collaboration, sharing of resources and learning beyond specific disciplinary

boundaries was created. The meetings played a major role in creating a link between the case study, the research questions and the overall research approach.

According to Schusler *et al.* (2003: 311), social learning is “learning that occurs when people engage one another, sharing diverse perspectives and experiences to develop a common framework of understanding and basis for joint action”. Over the years, social learning has been increasingly viewed as one of the crucial elements needed in maintaining cooperative management of natural resources (Pahl-Wostl *et al.*, 2007; Muller, 2013).

6.5. The case study method

This study adopted a case study research method. This is an investigative method that seeks the answers to research questions of the study in a single entity (Cohen *et al.*, 2000; Yin, 2003), using relevant data gathering techniques. The case study method permits the researcher to analyse an existing social problem within its actual context (Yin, 2009).

Since this study was a part of a larger transdisciplinary research project, the choice of the case study was largely influenced by the research gaps within the IWR research body. One of the main objectives of transdisciplinary research is to tackle problems that are context-specific and grounded in existent socio-economic circumstances. This aim is consistent with undertaking research using the case study research method (Clifford-Holmes, forthcoming).

According to Alston (2008), case studies are crucial as they enable new institutional economists to investigate overall forces of institutional changes and their underlying effects. In NIE, case studies are predominantly called “analytical narratives” (Alston, 2008: 103). It is argued that ““analytical” conveys the use of a theoretical framework or set of theoretical concepts and the term “narrative” conveys the use of historical qualitative evidence” (Alston, 2008: 103). This study combined historical narratives with NIE theory in order to analyse the influence of economics on the National Water Policy of South Africa as well as on the current institutional and governance arrangement in the LSRV catchment.

6.6. Key Informant Interviews

According to Boyce and Neale (2006), in-depth key informant interviews are essential tools needed for exploring the perspectives of individuals who have first-hand knowledge about an idea, the study area or a situation. Key informants of the study provided insights into water management instruments, institutional frameworks and programmes that are currently in place and/or needed to ensure sustainability, efficiency and equity in the allocation and management of water in the LSRV. The main informants in this study were the Chief Executive Officer of the LSR-WUA and an emerging farmer who has been involved in small scale commercial farming in the area for over five years.

The CEO represented the management and administrators of the LSR-WUA. His major role in the study was to give insights into management issues affecting the association. As the CEO, he has in-depth knowledge of the daily administrative issues and he is best placed to discuss and share the long-term strategic plans of the LSR-WUA, the challenges constraining the association from fulfilling their statutory duties and the strategies they have in place to mitigate challenges. The interview also provided perspective on how the LSR-WUA relates with emerging farmers and other users within its boundaries. The emerging farmer interviewed gave a different organisational landscape or view about the LSR-WUA as an organisation. Clifford-Holmes's (forthcoming) data extensively provided the views and insights of commercial farmers. As part of the TD team, students and/or researchers are encouraged to use and build on the work of other researchers working in the LSRV catchment to avoid interviewing stakeholders multiple times. According to Voss *et al.* (2002), to avoid bias, the use of informants from differentiated organisational landscapes is necessary. The interviews took place in May, 2014.

A key informant interview guide, written in English, was used to direct the interviews (see appendix 1). The questions in the guide were classified into four sub-headings, namely; a) general questions, b) equity indicators, c) efficiency and effectiveness indicators, and d) closing questions. Framing the questions around specific sub-headings is crucial in minimising the ambiguity of information obtained during the data analysis stage (Malhotra, 2004). The interviewees consented to the recording of the interviews that were

subsequently transcribed. The transcribed notes were then emailed to Clifford-Holmes and the interviewees for verification as information quality assurance mechanism.

The researcher acknowledged that the study had ethical issues by virtue of involving human subjects in the data collection process. The confidentiality of the information provided by respondents was respected and their anonymity was protected. Prior to the interview, the respondents were informed about the purposes of the study and the overall meaning of the participation. Furthermore, prior to undertaking the study, the researcher obtained ethical clearance in terms of the university's research policy.

The closing questions of the interview prompted the emergence of issues that were not covered in the key informant guide, but that were deemed important by the interviewees.

6.7. A brief overview of indicators used in the study

The table below gives an overview of the indicators used in this study, measures used for those indicators and their main sources. It further gives brief references of literature where those indicators have been used and/or defined.

Table 6.1: Indicators of choice, their respective measures and main data sources for the study

Indicator	Measure used in the study	Main data sources	Literature where the measure has been applied and/or defined
	Responsiveness to the needs of disadvantaged groups	LSR-WUA (2012 and 2013), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Ostrom (1990), Ostrom <i>et al.</i> (1994), Bandaragoda (2000), Agrawal (2001), Haldane <i>et al.</i> (2010), Grafton <i>et al.</i> (2011)
	The sensitivity of institutional arrangements to local needs	Clifford-Holmes <i>et al.</i> (2013), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Ostrom (1990), Ostrom <i>et al.</i> (1994), Bandaragoda (2000), Agrawal (2001), Haldane <i>et al.</i> (2010), Grafton <i>et al.</i> (2011)

	An enhanced opportunity for social inclusion	Clifford-Holmes <i>et al.</i> (2013), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Ostrom (1990), Ostrom <i>et al.</i> (1994), Bandaragoda (2000), Agrawal (2001), Haldane <i>et al.</i> (2010), Grafton <i>et al.</i> (2011)
EFFICIENCY	Financial sustainability through the estimation of annual monetary gains of the LSR-WUA	LSR-WUA (2008, 2009, 2010, 2011 and 2012), LSR-WUA (forthcoming), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Ostrom (1990), Ostrom <i>et al.</i> (1994), Bandaragoda (2000), Agrawal (2001), Haldane <i>et al.</i> (2010), Grafton <i>et al.</i> (2011)
EFFECTIVENESS	Transparency	LSR-WUA website, LSR-WUA (2008, 2009, 2010, 2011 and 2012), LSR-WUA (forthcoming), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	WPP (2002), Roger and Hall (2003), Menard and Saleth (2011)
	Accountability and regulation	LSR-WUA website, LSR-WUA (2008, 2009, 2010, 2011 and 2012), LSR-WUA (forthcoming), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Saleth and Dinar (2004), Gandhi and Crase (2009), Shen and Speed (2010), Ostrom (2011)
	Communication	LSR-WUA website, LSR-WUA (2008, 2009, 2010, 2011 and 2012), LSR-WUA (forthcoming), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Saleth and Dinar (2004), Gandhi and Crase (2009), Shen and Speed (2010), Ostrom (2011), Muller (2006, 2008 and 2013)
	Civil society participation	Clifford-Holmes <i>et al.</i> (2013), LSR-WUA representative (Pers. Comm. 2014), Emerging Farmer (Pers. Comm. 2014)	Ostrom, 1990; Ostrom <i>et al.</i> , 1994; Bandaragoda, 2000; Agrawal, 2001, Grafton <i>et al.</i> (2011)

6.8. Conclusion

This chapter described the research methods through which research questions for this study were answered. The assumption is that the considered research methods employed

took into consideration the type of research questions being addressed. This study formed part of a larger transdisciplinary research within the LSRV catchment. The key informant interviews were used to supplement the available transdisciplinary data in the study area. The following chapter provides an extensive analysis of the LSR-WUA case study.

CHAPTER SEVEN

Lower Sundays River Water Users Association: Case Study Analysis

7.1. Introduction

The need for water management and allocation policies and legislation that advocate for equitable distribution, sustainability and efficiency of water resources has prompted the South African government to undertake massive reforms and policy restructuring since 1994. Such legislation was conceived in the form of the Water Services Act (1997) and the National Water Act (1998). The key mandate of both pieces of legislation was to address socio-economic problems such as rural poverty and high levels of inequality that were inherited from the apartheid regime. This was done through promoting equity and sustainability in water management, and by accommodating developments in the sector such as local, provincial and national institutions (Perret, 2002).

The government aims to maintaining equity, sustainability and efficiency in the water sector through various centralised and decentralised institutions. The institutions operate at different levels of the water sector towards a common cause “to ensure that water is distributed, conserved, used, protected and allocated efficiently for the benefit of all” (RSA, 1998). This chapter will provide an in-depth analysis of the Lower Sundays River Water Users Association (LSR-WUA) as an institution operating at the local level.

This chapter outlines the most notable historical events, which have contributed significantly to the current operations of the Association. The chapter discusses and analyses the highlighted themes from the case study using NIE concepts and frameworks set out in chapters 2 and 3. The analysis is crucial in describing the influence of the existing institutional and water governance arrangements, and economic dynamics in the Lower Sundays River Valley (LSRV) in the efficiency, effectiveness and equity of water allocation in the catchment.

7.2. Historical institutional context: From Irrigation Board to Water Users Association

The Sundays River Irrigation Board (SRIB) was established through an Act of Parliament in 1917, with the fundamental aim of constructing Darlington Dam (formerly known as Lake Mentz) (LSR-WUA, 2014). The government of the time provided funds in the form of a loan to finance the dam building project (LSR-WUA, 2014). The loan repayment was the responsibility of the irrigators. They raised funds through paying a canal levy imposed by the Irrigation Board in order to repay the loan (LSR-WUA, 2014).

The SRIB was established solely for the benefit of the irrigators (LSR-WUA, 2014). The elected Irrigators served as Board members for a period of time prescribed by the SRIB's constitution. In addition to ensuring that the canals were well maintained and operational, the board members were also responsible for performing financial and administrative responsibilities (LSR-WUA, 2014). Furthermore, the board members had to draft policies enforced by the 1913 Land Act to the specification of their localities (LSR-WUA, 2014).

In August 2004, the SRIB was transformed into the Lower Sundays River Water Users Association (LSR-WUA) to operate in terms of National Water Act, 1998 (Act No 36 of 1998) (RSA, 1998; RSA, 2004; LSR-WUA, 2004; LSR-WUA, 2014). According to the Association's constitution, which was prepared in accordance with the requirements of Sections 91(1)(f), 93(1) and 94(2) of the NWA of 1998, some of the objectives of the LSR-WUA are to: ensure fair, equitable and efficient distribution of water to all members; improve access to water in previously disadvantaged communities; ensure efficient and consistent distribution of water by maintaining infrastructure in order to minimise water loss; promote efficient water use through capacity building; and encourage environmental management within its area of jurisdiction (LSR-WUA, 2004). The area of jurisdiction of the LSRV is indicated in Figure 7.1 and the overall water supply system of the LSRV is outlined in appendix 2. Within the area, the Association uses approximately 99 million cubic meters per annum (Mm^3/a) (DWA, 2011: iv).

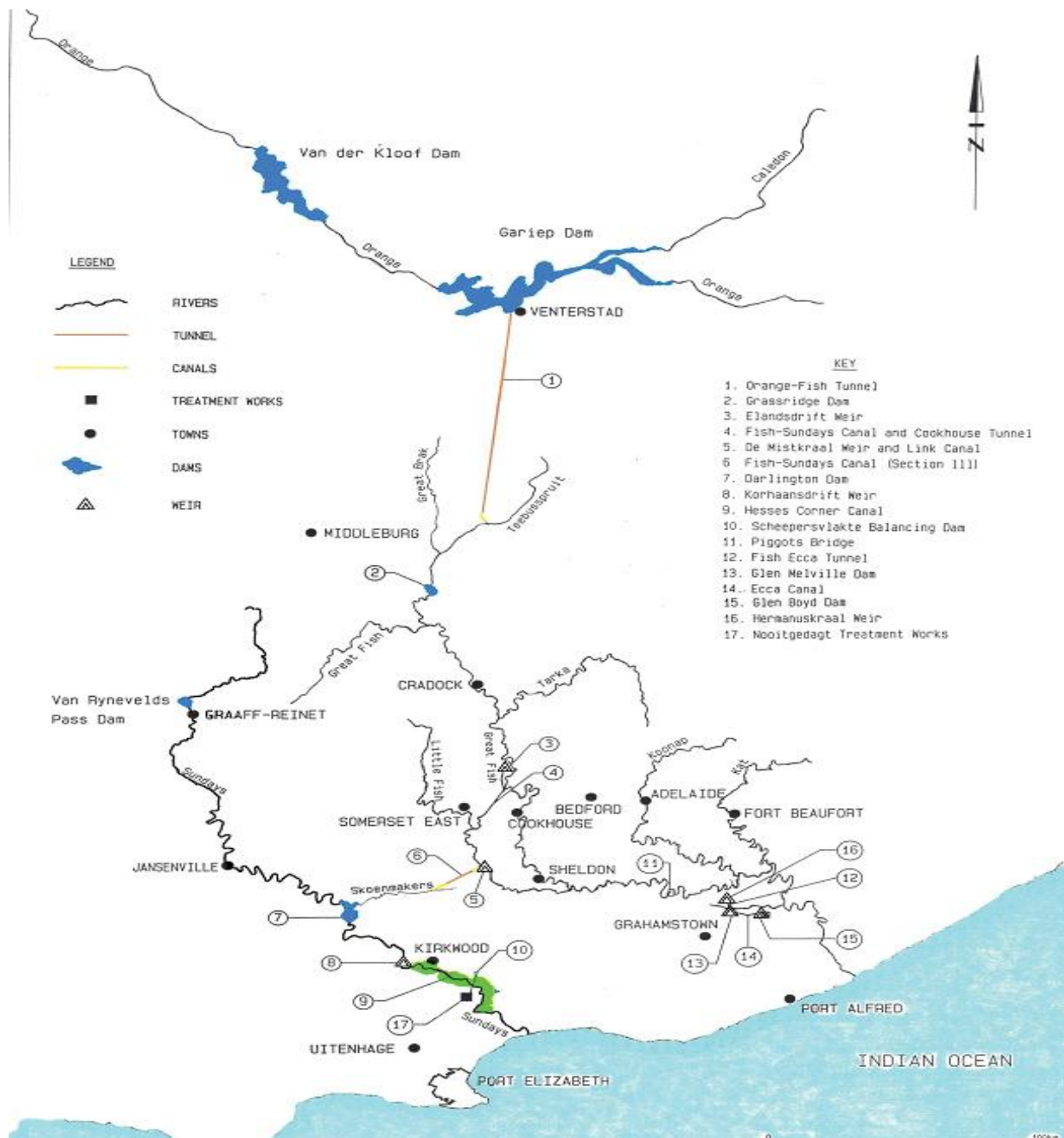


Figure 7.1: The area of jurisdiction of the LSR-WUA. (Source: LSR-WUA, 2014)

The Association intends to achieve its objectives through performing principal functions outlined in section 5 of its constitution, such as: supplying water for domestic, stock watering and irrigation use through constructing, purchasing, operating and maintaining waterworks; ensuring efficient functioning of the Association through prudent financial administration; provide overall control over waterworks and water resources; and preventing illegal water use, among other principal functions (LSR-WUA, 2004).

Subsequent to transformation, the LSR-WUA “retained all of the staff from the Irrigation Board” (LSR-WUA, 2014). Furthermore, the LSR-WUA was founded by elected members of the SRIB (LSR-WUA, 2004). The decision of the LSR-WUA to entrust former SRIB members with LSR-WUA duties was largely influenced by section 98(3)(c) of the NWA of 1998, wherein it is stated that “any person holding office with a [irrigation] board when this Act commences continues in office for the term of that person’s appointment”.

The Association still upholds the vision of providing expert-driven water supply services using operational and efficient infrastructure which was upheld by the SRIB before the promulgation of the NWA of 1998 (LSR-WUA, 2014). By implication, the current and future decisions made by the LSR-WUA are not independent from those made in the past under SRIB. In essence, the LSR-WUA preserved the status quo following its transformation from SRIB. It can hence be argued that the LSR-WUA displays a classic case of path dependency.

In South Africa’s water sector, the clash of interests between various stakeholders is common (Naster and Hansen, 2009). While the upper-regime levels has successfully embraced the principle of IWRM in enactment of both the White Paper on a National Water Policy for South Africa of 1997 and the National Water Act of 1998, the lower-regime levels are yet to fully experience transition (Naster and Hansen, 2009; Kemerink *et al.*, 2013). Naster and Hansen (2009) argue that the concept of path dependency offers a deeper understanding of barriers to transition in South Africa’s water sector. The argument is that previously disadvantaged and marginalised groups, such as rural households and emerging farmers, continue to be left behind because well-resourced stakeholders have superior leverage in the decisions of CMAs and consequently WUAs (Dent, 2009; Naster and Hansen, 2009; Kemerink *et al.*, 2013). For the purposes of this study, emerging farmers are “small-scale farmers who have a water license or who are supposed to obtain one soon” (Faysse, 2004: 6). This definition is used to define such groups within the WUA of South Africa (DWA, 2000 and 2002; Faysse, 2004).

It is further argued that the failure of the DWA to acknowledge the importance of analysing “knowledge equity” instead of focusing solely on “representative equity” at the reform phases in the water sector has resulted in the existence of persistent leverage by well-

resourced players (Dent, 2009; Naster and Hansen, 2009; Kemerink *et al.*, 2013). Recognition of knowledge equity necessitates the upper-regime level institutions to acknowledge empowerment of previously disadvantaged groups as a pressing priority prior to the establishment of CMAs and WUAs (Dent, 2009; Naster and Hansen, 2009). Financial and technical skills development is necessary for empowering local governments and emerging farmers in order to eliminate the existing economic, technical and legal leverage of the commercial farmers in WUAs and tilt the decision-making scale towards greater equity (Dent, 2009; Naster and Hansen, 2009; Heinmiller, 2009; Kemerink *et al.*, 2013).

Although cooperative governance forms the core of the NWA, translating the principle to practice has proven to be difficult due to the failure of the sector to establish both meaningful stakeholder participation and effective integration simultaneously (Naster and Hansen, 2009). The National Water Policy needs to acknowledge that factors such as old and effective networks, vested interests, existing formal or informal contractual water entitlements, and sunk costs towards canals, pipelines and other infrastructure, make it difficult for institutions to deviate from the path set in the past.

Liebowitz (1999) argues that the process of overcoming path dependence is dependent on the form of path dependence an institution is following. Nonetheless, it is argued that influential parties in institutions are most likely to inherit historical paths, for as long as their powers and inherent institutional efficiencies are not compromised (Streeck and Thelen, 2005; Sehring, 2009; Heinmiller, 2009).

7.3. Lower Sundays River Water Users Association- Sundays River Valley Municipality Interactions

In post-apartheid South Africa, the NWA of 1998 called for the transformation of irrigation boards to more democratic, inclusive and representative water users associations (RSA, 1998; Pegram and Mazibuko, 2003; Brown, 2011; Kemerink *et al.*, 2013). Furthermore, local government is now tasked with the responsibility of service delivery in the form of ensuring sufficient provision of water services to all users (d'Hont *et al.*, 2013; Clifford-Holmes *et al.*, 2013). The LSR-WUA has a water quota of 9000 m³/ha/a to be allocated to commercial farmers within area of 16 664 ha (DWFA, 2005; Clifford-Holmes *et al.*, 2013).

The SRVM receives approximately 3% of all the LSR-WUA's allocations as per order placement procedures, which it then treats before distributing it as potable water largely for domestic use (D'Hont *et al.*, 2013; Clifford-Holmes *et al.*, 2013). The municipality is incorporated as a "user" by the LSR-WUA, and hence it is represented by a nominated member who serves in the Management Committee of the Association (LSR-WUA, 2003; Clifford-Holmes *et al.*, 2013). By implication, the interactions between the SRVM and the LSR-WUA are governed by both the NWA of 1998 and the LSR-WUA constitution (RSA, 1998; LSR-WUA, 2003; Clifford-Holmes *et al.*, 2013). By extension, as a water service provider (WPS), the SRVM's decisions are governed by the Water Services Act of 1997, as well as the Strategic Framework for Water Services (RSA, 1997; Clifford-Holmes *et al.*, 2013). Furthermore, since the municipality acts as both a WSP and water service authority (WSA), a service contract must be instituted in order to allow for self-regulation between the operations of the WSP and WSA.

The SRVM, however, is struggling to ensure continuous provision of water services to all users within its jurisdiction. One of the contributory factors to this challenge is the lack of a contract between the LSR-WUA and the SRVM necessary for governing their operations (D'Hont *et al.*, 2013; Clifford-Holmes *et al.*, 2013). According to Clifford-Holmes *et al.* (2013: 6), the refusal of the LSR-WUA to formulate a binding contract between itself and the SRVM is based on the argument that,

"[T]he WUA treats all users the same, and does not require a contract between itself and a particular user - interactions are mandated by the constitution, facilitated and carried out by the WUA staff and overseen by the Management".

However, a water resource supply contract needs to be in place to govern the activities of the SRVM and the LSR-WUA by outlining the terms and conditions of raw water delivery, and the responsibilities and roles to be played by each party (DWAF, 2003; Clifford-Holmes *et al.*, 2013). In essence, there are institutional arrangements missing between the SRVM and the LSR-WUA.

Moreover, the SRVM representative neither attends the Management Committee meetings regularly, nor was he elected based on qualifications other than his knowledge on "how to

handle those white commercial farmers” (Clifford-Holmes *et al.*, 2013: 7) currently serving in various capacities in the LSR-WUA. Another contributory factor is the lack of sufficient water storage to meet the water demand in the municipal jurisdiction (Clifford-Holmes *et al.*, 2013).

D’Hont *et al.* (2013) argue that the water supply system in the LSRV area should look as depicted by Figure 7.2. The LSR-WUA supplies raw water resources to the SRVM “according to an order placement procedure” (D’Hont *et al.*, 2013: 5). The municipality stores and treats the water through its bulk water system to meet the demands of end users. According to Figure 7.2, there are three elements that interact with each other in the water supply system, namely: external factors, the means of stakeholders to intervene in the water supply system, and the outcomes of interest (D’Hont *et al.*, 2013).

According to D’Hont *et al.* (2013), the external factors influence the performance of the system as discussed in the chapter 5. It, however, is argued that factors within the system do not have any direct effect on external factors (Enserink *et al.*, 2010; D’Hont *et al.*, 2013). External factors that affect system performance include; policy changes, aggregate lifestyle expectations, the water supply system transferring water from the Orange River, and climatic variations such as floods, droughts and heat (Enserink *et al.*, 2010; D’Hont *et al.*, 2013).

In order to improve reliable water supply, the main stakeholders in the LSRV should intervene within their various capabilities and means. For instance, the SRVM could expand its water storage, the LSR-WUA could expand their delivery schedule to authorise raw water supply when needed during weekends, and the DWA could contribute to improved system performance by awarding grants (D’Hont *et al.*, 2013). Alternatively, the SRVM could intensify the operational management of the water treatment works (WTW).

The intervention of stakeholders through various means could lead to desired outcomes of interest such as reduced water supply disruptions in the area. Other outcomes of interest include facilitation of common understanding of the system, regulation of the maximum

capacity of the technical system, and identification of limiting factors within the water supply system (D’Hont *et al.*, 2013).

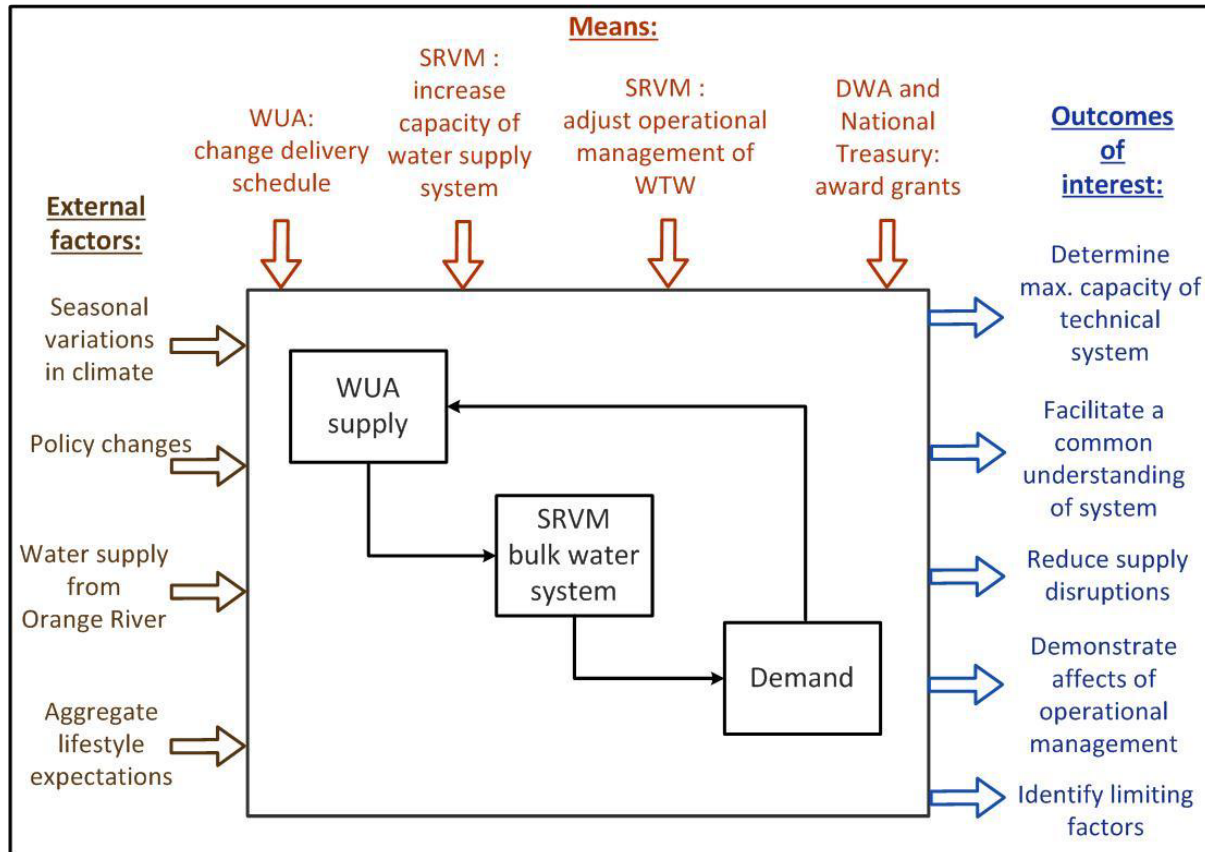


Figure 7.2: The water supply system in the LSRV area. (Source: D’Hont *et al.*, 2013)

7.4. Theoretical analysis of the existing interactions between the Lower Sundays River Water Users Association and the Sundays River Valley Municipality

It has been argued that government and water institutions often assume that representing the interests of various societal groups in establishments such as WUAs will automatically lead to improved water resource management and equity (Wester *et al.*, 2003; Kemerink *et al.*, 2013). However, water institutions comprise of various stakeholders with divergent and competing interests (Cleaver, 2000; Goldin, 2010). Water institutions within the LSRV catchment are not an exception. The failure to acknowledge such competition consequently leads to failure to notice the sources of the discrepancies in institutional arrangements. As

argued in chapter 2, the interdependencies of economic agents need to be recognised by water resource institutions.

Samuels and Medema (1998) argue that the Coase theorem has important implications for problems of legal-economic policy because it implies that where stakeholders' actions are not bound by contract, bargaining is almost impossible, and law and policy do not matter in instances where parties can easily determine and choose water uses with the highest returns. The absence of crucial institutional arrangements proposed by the DWA to oversee the interactions between the SRVM and the LSR-WUA shows that government institutions do not always have the capacity to instigate water policies in order to avoid catastrophes such as unreliable water supply to end users.

Allan (1999) maintains that government institutions often fail in their duties as regulators in the water sector because they have been unsuccessful in recognising the primary interests of user groups within catchments. It can be argued that the lack of success can be attributed to the failure to appreciate that establishing WUAs cannot automatically substitute for the domains of interactions, which existed within irrigation boards. Kemerink *et al.* (2013: 245) argue that, in fact, the establishment of WUAs contributes to complexity in the water sector as they lead to the "coexistence of different domains". This coexistence of different domains consequently lead to overlapping institutional functions, missing institutional arrangements between parties and general fragmentation of water institutions (Kemerink *et al.*, 2013).

According to Warner *et al.* (2008) and Kemerink *et al.* (2013), there is a need to analyse representation and inclusion within the various domains of interaction that deal with water allocation. Actors in the water sector are generally constrained by institutional arrangements that were designed to attain Pareto-optimal solutions for the influential few such as irrigation boards. The irrigation boards' primary objectives of maximising individual farmer's payoffs cannot be replaced by the social welfare objectives imposed by the NWA overnight (Wester *et al.*, 2003).

7.5. Lower Sundays River Water Users Association: Equity Considerations

According to section 4.1 of the LSR-WUA constitution, the Association is committed to regulating the distribution of water in a fair and equitable fashion for all its users (LSR-WUA, 2003). In the financial year 2011/2012, there were more than 400 users registered with the LSR-WUA (LSR-WUA, 2013). The three equity indicators, as discussed in chapter 3, which will be used to analyse the performance of the LSR-WUA are: responsiveness of the water institutional arrangements to the needs of lower income groups (Boyne, 2002), the sensitivity of institutional arrangements to local needs, and enhanced opportunities for social inclusion (Andrews and Entwistle, 2010).

The choice of the indicators is not only influenced by the requirements for establishing WUAs enshrined in the NWA of 1998, but also by NIE theory and/or frameworks discussed in chapter 2. WUAs have been entrusted with pursuing responsibilities such as empowering historically disadvantaged groups and/or individuals, promoting equitable water distribution, as well as promoting democracy and “representativity” (Orne-Gliemann, 2008).

7.5.1. Responsiveness to the needs of disadvantaged groups

WUAs were created to bring together diverse users such as municipalities, emerging farmers, commercial farmers, and recreational and conservation bodies to ensure equity and cooperation amongst local water users (RSA, 1998; Orne-Gliemann, 2008). However, maintaining equity and responsiveness to the needs of disadvantaged users remains a challenge in some WUAs in South Africa (Orne-Gliemann, 2008; Brown, 2011; van Steenberg, 2013). LSR-WUA is not an exception.

In his Chairperson’s Overview for financial year 2013/2014, Mr Myers, the Chairperson of LSR-WUA noted that they are yet to expand considerably the representation of emerging farmers in the Managing Committee of the Association (LSR-WUA, 2013). He also noted that LSR-WUA is yet to establish and promote its communication with emerging farmers in order to ascertain long-term mutual benefits between the farmers and the Association (LSR-WUA, 2013).

Lack of adequate representation of emerging farmers in the Managing Committee may consequently lead to inadequate responsiveness to their needs. The bargaining capacities and influential powers of commercial farmers subsequently count against the interests of emerging farmers as a result (Orne-Gliemann, 2008; Brown, 2011).

Orne-Gliemann (2008) argues WUAs associations remain less responsive to the needs of the emerging farmers and other disadvantaged groups because balancing the social equity and political obligations with their finances as well as embedded interests, remains a challenge in South Africa. The disincentive of commercial farmers and/or the LSR-WUA to go out of their way to accommodate the water and farming needs of the emerging small-scale farmers stems from the institutional and financing architecture of WUAs. This point is address in depth and substantively in this research below under the section discussing the difficulty of entering into service level contract(s) between SRVM and LSR-WUA.

The National Water Act of 1998 calls for a “balanced representation in terms of the various categories of users” (RSA, 1998). However, as stated by Kemerink *et al.* (2013), the concept of balanced representation proposed by the NWA remains loosely defined. According to Kemerink *et al.* (2013), it is not clear whether the categories of balanced representation referred to by the NWA mean demographic groups, specific gender groups or the so called disadvantaged groups.

In an interview, with an official from the LSR-WUA, conducted during the course of this research, the ambiguity of the meaning of balanced representation came out through the responses of the representative. When asked about the representation of emerging farmers in the LSR-WUA, the Association’s representative responded,

“The organisation is divided into seven wards. Six wards are for commercial farmers and one ward is for emerging farmers. There are emerging farmers’ representatives in every ward. There is one representative per ward in the six wards for commercial farmers, and there are three representatives in the seventh ward, which is for emerging farmers. Of all the nine representatives, four are black and five are white” (LSR-WUA representative, Pers. Comm. 2014).

The response given by the LSR-WUA representatives reflects that the Association defines 'balanced representation' using racial groups and not gender. When asked about his about his general opinions about the representation of emerging farmers within the LSR-WUA, the interviewed emerging farmer argued that,

“Having a representative within the Association gives us [emerging farmers] the voice and the platform to communicate our concerns. It also helps because we get mentorship in various forms. But we [emerging farmers] do not have the power to influence the decisions on charges and other things made by commercial farmers. Remember, big commercial farmers run the Association” (Emerging Farmer, Pers. Comm. 2014).

The response of the emerging farmer is in line with the theory on path dependency and unequal power relations discussed in the preceding chapters as well as with the argument posed by Kemerink *et al.* (2013: 252),

“Securing a seat on a WUA management committee does not automatically mean that the views and interests of historically disadvantaged individuals are represented in the newly established management structures: elements such as authorization, accountability, expertise and resemblance (here defined as the extent to which people feel alike and associated with each other) play a major role in the effectiveness of representation.”

Wellman's (2008) study on WUAs in the Olifants-Doorn water management area (WMA), established that mere inclusion of emerging farmers and previously disadvantaged individuals in the board of the WUAs does not guarantee equity in the decision-making processes. One of the reasons for the discrepancy was a lack of confidence and knowledge amongst previously disadvantaged members about the operations of WUAs (Wellman, 2008).

Scholars of NIE argue that where financially disadvantaged users are not adequately represented within collective action groups such as WUAs, the interests of the elite users such as large commercial farmers overshadow those of disadvantaged users because the elite have the power to influence the direction of decisions within WUAs (Baland and

Platteau, 2001; Orne-Gliemann, 2008). They further argue that lack of adequate representation of disadvantaged groups within decision-making bodies such as Managing Committees of WUAs consequently translates into the failure of the institution to ensure fairness and justice for all members (Baland and Platteau, 2001; Orne-Gliemann, 2008; Gandhi and Crase, 2009).

7.5.2. The sensitivity of institutional arrangements to local needs and enhanced opportunity for social inclusion

By virtue of being a potable water supplier for small-scale domestic use, SRVM needs to be treated differently from other users within the LRV-WUA (Clifford-Holmes *et al.*, 2013). The responsibility of providing reliable water supply to end users necessitates the need for contractual agreements between the SRVM and the LSR-WUA in order to ensure that problems of interrupted water supply are eliminated. However, ‘governance gaps’ that currently exist between the two institutions have rendered both the SRVM and LSR-WUA insensitive to the need of the local residents (Clifford-Holmes *et al.*, 2013). Clifford-Holmes *et al.* (2013: 7) state that

“When the operational issues pertaining to the Kirkwood system were raised, the DWA assessors challenged the SRVM, saying that the WUA is a service provider to the municipality and since the SRVM is the water service authority, they should be regulating the WUA’s supply.”

The lack of an operational contract between the LSR-WUA and the SRVM has led to some degree of confusion towards the institutional operations and responsibilities of the two institutions. Worse still, the institutional distinctions created by water policy frameworks remain blurred in the LSRV. According to Clifford-Holmes *et al.* (2013), one of the contributory factors to such a discrepancy is little and/or no incentive by the institutions to maximise the gains of establishing effective interactions that would enable sensitivity to local water supply needs. The LSR-WUA has little incentive to change the operation’s status quo established by the SRIB, while the SRVM has little incentive to take an active role in participating in the Managing Committee and general operations of the LSR-WUA (Clifford-Holmes *et al.*, 2013).

New institutional economists argue that institutions, such as incentive systems, dictate the actions of parties involved (Zenger *et al.*, 2002; North, 2005; Lieberherr, 2009). Contracts enforcing institutions are therefore necessary for creating incentives for the establishment of institutional arrangements that are both socially inclusive and sensitive to the diverse needs of all individuals (Greif, 2005; Menard and Shirley, 2005; Lieberherr, 2009). Furthermore, such institutional arrangements are necessary for offsetting potential rent-seeking behaviour, discriminatory vested interests as well as power abuse by the historically advantaged (Greif, 2005; Menard and Shirley, 2005; Lieberherr, 2009).

7.6. Lower Sundays River Water Users Association: Efficiency Considerations

The efficiency indicator used in this study is the estimates of annual monetary gains of the LSR-WUA defined in chapter 3. The choice of the indicator is influenced by the NIE framework discussed in the chapter as well as the availability of data in the case study.

The NWA of 1998 has tasked the management committees of WUAs with the responsibilities of maintaining financial and accounting records, ensuring that the records truthfully represent the operations of the associations, and to safeguard the integrity of the associations' financial statements (RSA, 1998; LSR-WUA, 2012). Correspondingly, the LSR-WUA's managing committee has diligently performed the tasks bestowed on them by releasing comprehensive and externally audited financial statements over the years (LSR-WUA, 2008, 2009, 2010, 2011 and 2012).

While the LSR-WUA has experienced a growth in its total expenses over the past four years, the Association has maintained positive financial balances over the period as summarised in Figure 7.3. The figure shows that the net income of LSR-WUA has been consistently growing for the past four years. It can hence be argued that the Association is at least solvent, which is important for their continued operation. This could be attributed to the budgeting and reserve funds practices of the Association. The reserve funds are kept to cater for large costs such as canal replacement (LSR-WUA, forthcoming).

According to Downes (2013), the budgeting process is generally view as a transaction cost minimisation measure if it is displays fiscally sustainability, budget transparency and budget participation. Downes (2013: 2) differentiates between an ‘effective’ budgeting system and a ‘sound’ budgeting system. It is argued that an effective budget takes into account the diverse interests of stakeholders within an institution (Onimode, 1999; Nils *et al.*, 2003; Downes, 2013). Downes (2013: 2) argues that,

“A *sound* budgeting system is one which engenders trust among citizens that the government is listening to their concerns, has a plan for achieving worthwhile objectives, and will use the available resources effectively, efficiently and in a sustainable manner in doing so.”

Effective and sound budgeting systems are argued to be crucial for attaining increased efficiency in the operations of the institutions (Nee, 2003; Gandhi and Crase, 2009). Williamson (1998 and 2000) argues that budgeting, as a transaction cost minimising measure, is necessary for developing governance structures and organisational boundaries within which the institution can generate profits.

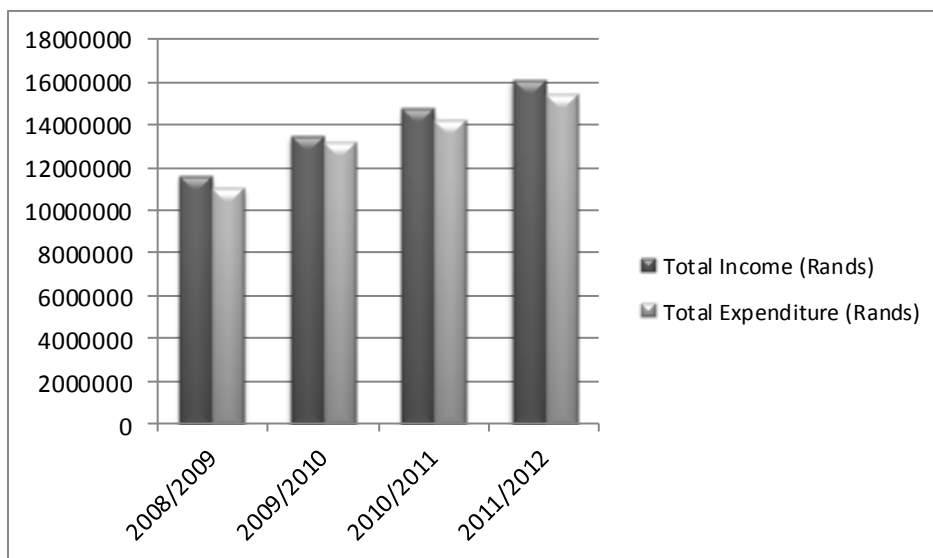


Figure 7.3: Total income and total expenditure of LSR-WUA between 2008 and 2012. Figures are in 2010 Rands, using Producer Price Index (PPI) provided by Statistics South Africa (Source: LSR-WUA, 2008, 2009, 2010, 2011 and 2012)

According to the financial reports of the LSR-WUA, more than 50% of the total expenses is paid to the DWA as water rates (LSR-WUA, 2008, 2009, 2010, 2011 and 2012). The LSR-WUA, like other WUAs, acts as a billing agent acting on behalf of the DWA (DWAF, 2003; DWA, 2010). As a billing agent, the LSR-WUA has to collect water resource management (WRM) charges, consumptive use charges as well as water research levies (DWAF, 2003; DWA, 2010). WRM charges are set against registered volumes of raw water resources, and are payable by all users demanding raw water from the LSR-WUA, including the SRVM and irrigators (DWAF, 2003; DWA, 2010). Consumptive use charges include operational maintenance and capital costs, while water research levies are payable by all water users in the LSR-WUA to the Water Research Commission (WRC) as per the requirements of the Water Research Act (WRA).

According to the Association's 2009 and 2010 annual reports, the LSR-WUA prides itself with "sound" and "well controlled" finances (LSR-WUA, 2009) and "intense management" (LSR-WUA, 2010). Furthermore, the Association has provisions for financial sustainability in the form of various funds such as the capital reserve funds, maintenance funds and contingency reserve fund (LSR-WUA, 2008, 2009, 2010, 2011 and 2012). The interviewed emerging farmer seems to agree that the LSR-WUA financial affairs are well managed. In his response, the representative held,

"I have no problem with the Association's (LSR-WUA) budgeting and finances. They have accountants and experts, so I am not complaining. But I can barely afford to cover water costs in some periods. There is a rumour that the rates are going up again, how worse is it going to be?" (Emerging Farmer, Pers. Comm. 2014)

The efficiency versus cost-effectiveness paradox seems to emerge within the LSR-WUA. For instance, in his 2011/2012 Chairman's Overview, Mr Myers highlighted that the Managing Committee of the LSR-WUA had adopted new governance and compliance systems which were not going to result in reduced costs, but which would "certainly serve to contribute to more effective control and general efficiency of our operation" (LSR-WUA, 2011). According to one of the Association's reports, the management of the LSR-WUA aims to improve operational efficiency in the water supply system through the following:

“Losses in the system are reduced to the minimum and currently a mathematical model and related field measurements are being developed so achieve better water-management control. This model will assess administrative and physical distribution efficiency by measuring the volume of water that was requested against the volume of water that was brought into the system and the volume that can be accounted for delivered at farm-gate sluice” (LSR-WUA, forthcoming).

Similarly, in his 2012/2013 Overview, the Mr Myers mentioned the LSR-WUA has established ways through which water-workers could achieve water supply efficiency and the Association would in turn cover the costs of operations through increasing user charges (LSR-WUA, 2012). A representative from the LSR-WUA revealed, through an interview, that the Association can perform a charge assessment in an effort to cover its expenditures, “all users are aware of that” (LSR-WUA representative, Pers. Comm. 2014).

In his overview, My Myers emphasised that the question that emerges from operational efficiency developments is

“What better level of service do I expect and am I prepared to pay the higher costs involved in delivering this level of service?” (LSR-WUA, 2012).

Cost-effectiveness is achieved when the institutions fulfil their targets at the minimum possible cost (Grimshaw *et al.*, 2004; Haas *et al.*, 2011; Gleick *et al.*, 2011). Williamson (1998) argues that cost economisation is a necessary tool for ensuring sustainability of the institution. He further argues that often, the objectives of reducing transaction costs and attaining cost-effectiveness are in tension (Williamson, 1998).

Economists argue that efficiency, on the other hand, entails converting minimum inputs, such as time, expertise and finances, into maximum possible outputs and outcomes (Goulder *et al.*, 1999; Tol, 1999; Tietenberg and Lewis, 2000; Grimshaw *et al.*, 2004; Haas *et al.*, 2011). New institutional and neoclassical economics scholars argue that water charges are one of the instruments water institutions use for attaining efficient allocations and cost recovery (Tietenberg and Lewis, 2000; Grimshaw *et al.*, 2004; Haas *et al.*, 2011). They

maintain that water institutions should set prices at average cost in order to allow institutions recover their operational and maintenance costs.

Theoretically, efficiency is attained when water charges are set at the marginal cost as this serves as a signal of the value of the water used to users (Tietenberg and Lewis, 2000; Grimshaw *et al.*, 2004; Haas *et al.*, 2011). However, according to new Institutional economists, setting water prices at the marginal cost is more useful if institutional arrangements and local conditions are factored in while pricing (Tietenberg and Lewis, 2000; Grimshaw *et al.*, 2004; Haas *et al.*, 2011).

Inasmuch as institutions are encouraged to recover their costs and to invest in both maintenance of water infrastructure and profitable water development projects, cost-effectiveness should always be maintained (Saleth and Dinar, 2004; UNESCO, 2012). High water charges may consequently infringe on the right to access of water, especially of the poor households and emerging farmers (Grimble, 1999; UNESCO, 2012). As Rogers *et al.* (2002: 2) argue, increasing the water charges is regressive, and it broadens social inequities because of the “typical price and income elasticities for water and the typical income distributions encountered”.

Essentially, the positive financial trends of the LSR-WUA reflect the Association’s financial prudence and sustainability. It can hence be argued that the positive financial balances of the Association reveal the ability of the institution to withstand and/or offset the dynamic problems it may face from time to time. This satisfies North’s (1990) basic definition of efficiency discussed in chapter 2 of this study. However, using the extended definition of efficiency in NIE, where effectiveness is a necessary condition to achieving efficiency, it can be concluded that the LSR-WUA’s operations are not efficient. This definition is consistent with the NWA requirement that ancillary functions should only be performed by WUAs mandated to perform the water services functions and with the resource capacity sufficient for the successful execution of their principal functions (RSA, 1998). The high water charges imposed on emerging farmers is more likely to affect their productivity and profitability, hence failing to fulfil some of the main objectives of the Association. As argued in chapter 2, it is more important for institutions to do what they have proposed well, than to do well

something else that was not necessarily proposed (Mihaiu *et al.*, 2010). By implication, it is more important for the LSR-WUA to perform its principal functions well than to do well in its secondary functions.

7.7. Lower Sundays River Water Users Association: Effectiveness Considerations

Treating water as a both social and economic good necessitates water institutions to develop conflict resolution mechanisms and transparent structures that promote accountability, communication, civil society participation and other measures of effectiveness (Bandaragoda, 2000; WPP, 2002; Roger and Hall, 2003; Menard and Saleth, 2011). According to Saleth and Dinar (2004: 11),

“The crisis in the water sector has also revealed the inherent limitations of today’s institutions in dealing effectively with the new set of problems related more to resource allocation and management than to resource development.”

WUAs need to treat water users as clients, not just beneficiaries (Saleth and Dinar, 2004). This requires them to craft measures that balance the supply and demand for water resources through defining rules for water allocation, development and use in an effective way (Saleth and Dinar, 2004; Menard and Saleth, 2011). In NIE, however, the term “effectiveness” remains difficult to define (Lieberherr, 2009). This is because in NIE, effectiveness is considered an outcome of efficiency (Libecap, 2006; Lieberherr, 2009; March, 2010). Considering effectiveness as merely an outcome of efficiency implies that minimising transaction costs directly translates to effectiveness.

Essentially, focusing on minimal transaction costs as a key way of defining effectiveness makes it difficult and almost impossible to disentangle effectiveness from efficiency as discussed in chapter 3 (Lieberherr, 2009). Some scholars within NIE, however, have developed a quantitative framework within which the effectiveness of water institutions can be evaluated (WPP, 2002; Roger and Hall, 2003; Menard and Saleth, 2011). Such scholars define effectiveness as,

“The existence of the best feasible institutions (that are the outcome of individual choices), which increase the enforceability of contracts.” (Lieberherr, 2009: 20)

The indicators identified within the quantitative framework allow for an independent analysis of effectiveness without necessarily solely depending on transaction-costs and efficiency (Roger and Hall, 2003; Menard and Saleth, 2011). Table 7.1 summarises the indicators developed based on the theory discussed in chapters 2 and 3 with reference to the LSR-WUA.

Table 7.1: Effectiveness indicators and their application to the LSR-WUA case

Effectiveness Indicator	Application to LSR-WUA
Transparency	<ul style="list-style-type: none"> • Annual general meetings (AGMs) are held as per the requirements of the NWA of 1998 and the LSR-WUA constitution and are open for all water users. • Minutes of the previous AGM are circulated and confirmed by all users beforehand. • Financial statements are circulated beforehand. Water users can ask for clarity, reject or accept and/or approve the statements in their form. • Annual reports are circulated before the AGM and water users can ask for clarity at any date before the announced date of the AGM.
Accountability and regulation	<ul style="list-style-type: none"> • The Management Committee has to operate according to the prescribed functions in the NWA of 1998 and the LSR-WUA constitution. • Non-performing members are to be disqualified according to Schedule 4 of the NWA. • Annual financial statements are internally and externally audited in accordance with Section 33 (1) of the NWA. • Financial statements are prepared as per International Reporting Standards.

Communication	<ul style="list-style-type: none"> • Notices are communicated to the members through letters and the Association’s website. • As at April 2014, the events calendar for 2014 has not been updated in the website. However, the annual reports and financial statements were up to date.
Civil society participation	<ul style="list-style-type: none"> • The SRVM representative in the Management Committee acts as an intermediary between the Association and the municipality, and subsequently potable water users. • Clifford-Holmes <i>et al.</i>, (2013) note that “despite occupying a seat on the management committee, the SRVM representative rarely attended [meetings prior mid-2012]”

Using these indicators, it can be concluded that the LSR-WUA arguably displays transparent, and accountable regulatory governance. The committee is responsible for budgeting, compiling reports and project planning, among other functions (LSR-WUA, 2012). It is argued that stakeholder participation in the budgeting and project planning processes leads to improved effectiveness of the institution (WPP, 2002; Roger and Hall, 2003; Menard and Saleth, 2011).

Furthermore, the Management Committee consists of representatives for various users. This implies that the committee consists of people with diverse interests. New institutional economists argue that cooperative governance is inefficient in reacting promptly to shocks and accumulating capital due to complexities associated with managing incentives of individuals with divergent and varying interests (Menard and Shirley, 2005; Brousseau and Glachant, 2008). It is further argued that cooperative governance often leads to blame shifts between agents (Menard and Shirley, 2005). The blame shift problem seems to exist in the LSRV.

The representative of the LSR-WUA cited the “blame game” as one of the main challenges faced by the Association. He highlighted:

“One of the main challenges faced with the stakeholders in the Valley is ‘blame game’. Because there are so many institutions and people involved, it is very easy to play the blame game. That is why there is a lot of, “We didn’t do anything wrong, you are wrong and because of you we don’t have the water!” in the Valley.”

The lack of formal service level agreements between the LSR-WUA and other stakeholders, particularly the SRVM has consequently led to the absence of clear areas of responsibility and mechanisms of enforcing agreed obligations. This greatly increased transactions costs associated with continual negotiation and led to conflict in which no one accepted responsibility, and subsequently the “blame game” for service delivery failure. Furthermore, there seems to be an existing degree of doubt concerning the technical capabilities of municipal officials among consulting engineers who interacted with the SRVM (Clifford-Holmes, forthcoming). Such stakeholders justify the blame shift by offering racial explanations. In this regard a retired engineer was quoted by Clifford-Holmes (forthcoming: 59) stating that, “These black officials only know how to do one thing - and that’s break infrastructure (sic)”.

The problem of blame-shifting from one agent to the other seems to be common in the water issues in South Africa. In the National Development Plan (NDP), it is extensively argued that:

“Example of what happens when the water in a town is found to be undrinkable. The media blames the Minister of Water Affairs. The community blames the mayor. The mayor blames the head of the water utility. The head of the water utility blames the technical engineer. The engineer says that the maintenance budget has been cut for the past three years and now the water is undrinkable. The head of finance in the municipality says that the budget was cut because personnel costs have crowded out maintenance expenditure. The mayor argues that the salary structure is negotiated at a national level by the level by the South African Local Government Association. The Association says that municipalities can opt out of these agreements if they are unaffordable. And so on. ” (NDP, 2011: 51-52)

NIE scholars argue that in a cooperative governance setup, agents often fail to cooperate and clear lines of power relations are often visible (Reuben, 2003; Ostrom, 2004; Brown, 2010). Scholars argue that heterogeneity of endowments, as well as homogeneity of identities and interests, are some of the indicators that should be used for gauging the success of WUAs in terms of efficiency, effectiveness and equity (Saleth and Dinar, 2004; Dinar and Saleth, 2005; Grafton *et al.*, 2011).

7.8. Conclusion

One of the main goals of this study was to describe the influence of the existing institutional and water governance arrangements in the LSRV in the efficiency, effectiveness and equity of water allocation in the catchment. This chapter answered the research goal through presenting the historical context of the LSR-WUA and discussing how embedded interests and path dependency have shaped the operations of the Association to date.

Traditionally, irrigation boards operated as raw water suppliers to commercial farmers. Subsequently, the irrigation boards were called to transform to WUAs. The transformation of the SRIB to LSR-WUA exhibits path dependence. Although the LSR-WUA arguably displays transparent, accountable and regulatory governance with an effective and sound budgeting system, the institutional arrangements between the Association and the SRVM are less sensitive to local needs.

Furthermore, the chapter argues that lack of adequate representation of emerging farmers in the Managing Committee may subsequently result in inadequate responsiveness to their needs. Using the indicators of effectiveness developed through the theoretical framework discussed in the preceding chapters, it is argued that the LSR-WUA arguably displays transparent, accountable and regulatory governance. However, the civil society indicator of effectiveness is not satisfactorily achieved due to lack of regular representation of SRVM in the management committee meetings.

In the following chapter, analyses of preceding chapters are carefully outlined and a summary of the main policy implications are discussed.

CHAPTER EIGHT

SUMMARY AND RECOMMENDATIONS

8.1. Conclusions

The primary goal of this research was to analyse the institutional governance and performance of the Lower Sunday River Water Users Association (LSR-WUA), as a raw water supplier to various users, using equity, efficiency and effectiveness as key indicators. This goal is addressed through defining the underlying economic theory behind the South African National Water Policy, and its impact on the overall institutional design and operations of water users' associations (WUAs).

This study was premised on post-positivist and interpretive research paradigms. Institutional governance and institutional framework analysis form the fundamental foundation of the study, enabling the exploration of relevant governance dynamics and mechanisms in the water allocation and distribution process (Henderson, 2011; Lee and Cassell, 2013).

A narrative approach using literature and document analysis provided an insight into the economic and institutional history of the LSRV. The influence of neoclassical economics South Africa's National Water Policy as well as on the current institutional and governance arrangement in the LSRV was investigated through the selection appropriate institutional frameworks using the literature, such as levels of economic institutions discussed in chapter 4 (Williamson, 2000; Brousseau and Glachant, 2008; Lieberherr, 2009).

In addition to analysing the LSR-WUA's annual reports and various documents from both electronic and printed sources, the study also evaluated documents on case study data collected by Clifford-Holmes between October 2011 and August 2013. These documents and the data were specifically about the LSRV and SRVM. Face-to-face key informant interviews with the CEO of the LSR-WUA and an emerging farmer with more than five years in the study area were conducted to provide insights into the efficiency and equity of current water allocation in the LSRV. The interviews also provided supplementary data needed to address the research questions postulated by this study.

New institutional economics (NIE) indicators for effective, efficient and equitable water institutions, such as enhanced opportunities for social inclusion, sensitivity to local needs and community participation, formed the focus of the interviews. Financial reports of the LSR-WUA were used to analyse the financial trend of the Association as an efficiency indicator.

With approximately 70% of land surface in South Africa receiving an average annual rainfall varying from less than 200 mm to 600 mm, it comes as no surprise that the country is classified as semi-arid (Palmer and Ainslie, 2007; Vetter, 2009; Cretat *et al.*, 2012). However, the thesis argues that climatic factors are not the only problems faced by the water resource sector in South Africa. The apartheid history, institutional gaps existing between and across water institutions, and limited empowerment of resource poor and/or emerging farmers are some of the other factors constraining equitable access to water resources in South Africa.

Despite of the promulgation of new water laws post-apartheid by the South African government, some parts of the country are still faced with inequitable, inefficient, and inadequate water supply (Thompson *et al.*, 2001; Brown, 2011; Karar *et al.*, 2011). Furthermore, despite having legislature that is internationally regarded as ambitious and forward-thinking reflective of the broad aims of IWRM, the South African government is yet to fully provide resource capacities to some municipalities and other local-level water institutions in order to enable them to embrace IWRM (Saravanan *et al.*, 2009).

The study discussed the water supply dynamics within the LSRV catchment. The Lower Sundays River Water Users Association (LSR-WUA) provides raw to commercial and emerging farmers, as well as to Sundays River Valley Municipality (SRVM). The water supplied by the LSR-WUA is predominantly used for irrigation purposes over an agricultural area of approximately 17 200 ha (LSR-WUA, 2013). The Association supplies raw water resources to a range of users such as the commercial farmers, emerging farmers, Scheepersvlake Dam and the SRVM through water canals depicted in appendix 2.

It is argued that there is noticeable inequality between the municipal populace and the commercial citrus industry with regards to water distribution in the LSRV. It is submitted that such factors as fragmented water institutions, and lack of clarity in respect of institutional arrangements and designs contribute to the inequity (Fischhendler and Heikkila, 2010; Lorz *et al.*, 2011; Du Toit *et al.*, 2011; Clifford-Holmes *et al.*, 2012).

Using the NIE description of path dependence discussed in chapter 2 (Lowndes, 2005; Streeck and Thelen, 2005; Heinmiller, 2009), the study established that the current and future decisions made by the LSR-WUA are not entirely independent of those made in the past under SRIB. As found by this study, the Association still upholds the vision of providing expert-driven water supply services using operational and efficient infrastructure which was upheld by the SRIB before the promulgation of the NWA of 1998 (LSR-WUA, 2014). The thesis argues that such factors as old effective networks, vested interests of commercial farmers, sunk costs towards the building of canals, among other factors, may have influenced the dependence of the LSR-WUA on the SRIB's set path.

While efficiency and effectiveness are often referred to as "doing things right" and "doing the right thing" (Elebring *et al.*, 2012) respectively, this study argues that effectiveness is a necessary condition to achieving efficiency (Mihaiu *et al.*, 2010; Richter, 2012). As argued by NIE, an institution cannot be efficient without being effective because it is more important for institutions to do what they have proposed well, than do well something else that was not necessarily a key objective. Using NIE principles necessary for robust institutional governance (chapter 2) as well as indicators for robust water governance institutions (chapter 3), the effectiveness indicators for this study included transparency, accountability, regulation, communication and civil society to analyse the operations of the LSR-WUA.

Similarly, the equity indicators used in the analysis of the LSR-WUA case included responsiveness of the water institutional arrangements to the needs of lower income groups (Boyne, 2002), the sensitivity of institutional arrangements to local needs, and enhanced opportunities for social inclusion (Andrews and Entwistle, 2010). The efficiency indicator used in this study is the estimates of annual monetary gains of the LSR-WUA. The

NIE framework discussed in chapter 3 as well as the availability of data in the case study influenced the choice of the efficiency indicator.

The LSR-WUA is one of the few effectively operating WUAs in the Eastern Cape and in South Africa. It is argued that the Association displays effectiveness in terms of accountability, communication, transparency and regulation. Furthermore, the Association displays financial prudence in terms of a positive financial trend over the past five years. However, the absence of contractual agreement between the LRS-WUA, which acts as the bulk water supplier, and the SRVM, which acts as both the water services authority (WSA) and the water service provider (WSP), creates an institutional arrangement deficiency. Such an institutional arrangement vacuum can lead to a failure of the water institutions in the catchment to provide water resources effectively (Lorz *et al.*, 2011; Du Toit *et al.*, 2011). Furthermore, the interview with the emerging farmer revealed that having a representative in the Management Committee of the Association does not necessarily imply having an influence in the decision-making processes of the Committee (Emerging Farmer, Pers. Comm. 2014). The statements by both the Chairman of the LSR-WUA and the emerging farmer revealed that the charges for water use are high water charges (LSR-WUA, 2012).

In light of this, it is argued that a positive financial trend does not necessarily fully satisfy the efficiency requirement of NIE, where doing the right thing is more important than doing things which were not necessarily key objectives right (Mihaiu *et al.*, 2010; Richter, 2012).

As argued in this study, financial and technical skills development is necessary for empowering local governments and emerging farmers in order to eliminate the existing economic, technical and legal leverage of the commercial farmers in WUAs. Financial and technical skills development is also crucial for tilting the decision-making scale towards greater equity (Heinmiller, 2009; Kemerinket *et al.*, 2013).

The other prominent proposition is that although the NWA is premised largely on neoclassical economics, some sections of the Act, such as the cooperative governance enactments, conform to NIE. The disposition of the NWA of South Africa towards neoclassical economics paradigm does not deviate from the international trend (Lieberherr,

2009). It is argued that the analytical tools of neoclassical economics and its conceptual framework have played a fundamental role in influencing the formulation and implementation of regulatory enactments, as well as in the design of optimal pricing of water resources (Berg and Tschirhart, 1995; Savenije and van der Zaag, 2002; Geradin 2006; Guthrie 2006; Lieberherr, 2009). For example, in South Africa the NWA proposes that WUAs have to be self-funding through water pricing.

In light of the above, the thesis argues that the swiftly changing world, which entails emerging water users, requires policy-makers to embrace NIE economic principles such as institutional governance and arrangements in policy development. This could be done through incorporating local needs and knowledge during the formulation stages of water policy.

Embracing NIE economic principles could also be done through not only recognising the interconnectedness of levels of economic institutions during the formulation and implementation stages of water policy, but also formulating institutional designs considering factors such as scope, history and power relations as discussed in the preceding chapters. As found in this study, the LSR-WUA remains less responsive to the needs of the emerging farmers and other disadvantaged groups because balancing the social equity and political obligations with their finances as well as embedded interests remains a challenge. According to NIE, the success or lack thereof, of WUAs to perform their duties effectively depends on the overall processes of institutional design (Ackerman, 2004; Orne-Gliemann, 2008; Menard and Saleth, 2011).

The SRIB was originally established solely for the benefit of the irrigators and its operations were financed through the imposition of canal levy on irrigators. In its mandate of creating institutions progressively fashioned as a tool for the reallocation of natural resources in the country post-apartheid, South Africa's water policy, through the NWA, entrusted a strong political agenda to local water management institutions (NWA, 1998; Orne-Gliemann, 2008). As argued by Orne-Gliemann (2008: 2),

“The question remains however of the conciliation of these multiple objectives – IWRM, community participation, political agenda – within a unique local institution whose development is already impeded by historical legacies”.

Subsequent to its transformation from an irrigation board, the LSR-WUA not only retained all of the staff from the parent organisation, but also preserved the vision of the SRIB. It is argued that the success of the LSR-WUA’s operations can be attributed to the adaptation of historical experiences and identities that proved to be effective and efficient in the SRIB. Chapter 7 illustrates, using various performance and governance indicators, that LSR-WUA arguably displays transparent, accountable and regulatory financial governance. Despite these positive elements, the institutional arrangements missing between the SRVM and the LSR-WUA lead to operational vacuums and water supply disruptions in the LSRV catchment area.

The NWA mandate of equitable water distribution disregards the existing power relations and local dynamics, which consequently dictate the operations of the institutions involved. According to Ostrom (1990: 14), abstract policy formulation leads to dysfunctional institutional arrangements and operations “unless the models are well specified and empirically valid and the participants in a field setting understand how to make the new rules work.” There is, however, no single model or blueprint of achieving effective governance strategy or model that will be applicable to all contexts.

8.2. Substantive Recommendations

8.2.1. Policy formulation and governance

The speedy development of diverse demands for water resources coupled with the rapid evolution of environmental and climatic problems should ideally lead to an increased pressure on policy-makers and governments to provide unified strategic plans for water users with dissimilar interests, as well as to develop credible approaches of implementing such strategies. As argued by Muller (2008: 5),

“The fragmented, incoherent and complex nature of modern society [necessitates] governments to find alternative ways and adopt new roles to cope with ‘the limits to governance’ which threaten to overwhelm public action.”

The concept of ‘the limits to governance’ is used as an umbrella phrase for constraining factors such as fragmented institutions, failure to implement policies, uncertainties and fast growth pace of the modern world (Peters, 1998; Carley and Cristie, 2000; Muller, 2004, 2008 and 2013).

Various literature from a wide range of disciplines have, over the years, cited integrated management as a way of promoting sustainable, cooperative and coordinated development (GWP, 2000; Braga, 2001; Saravanan *et al.*, 2009; Haigh *et al.*, 2010). A question asked by Muller (2004: 400) is, “So why is it seemingly so difficult to develop integrated management approaches and what can or are being done in this regard?” is still relevant a decade later.

In South Africa’s water sector, the IWRM approach is widely embraced to address persistent problems such as institutional inefficiencies, poor service delivery, a lack of integrated planning and allocation of water resources, and lack of participation of some of relevant water sector stakeholders (NWA, 1998; Milly *et al.*, 2008; Du Toit *et al.*, 2011).

Although certain aspects of the water policy in South Africa embrace NIE principles in an effort to achieve optimal allocation of water resources, implementation remains a challenge in most cases. This is generally because the government and water institutions often assume that representing the interests of various societal groups in establishments such as WUAs will automatically lead to improved water resource management, efficiency and equity (Wester *et al.*, 2003; Kemerink *et al.*, 2013). There is a need, therefore, to craft workable implementation strategies, depending on the needs of the community, through communication and thorough consultation during the formulation phase of policy. According to NIE, such strategies include having binary choice for organising transactions (Williamson, 1979; Samuels and Medema, 1998; Acemoglu, 2003). As discussed in chapter 7, the binary choice options include contractual arrangements such as long-term contracts that could guide the services offered by the LSR-WUA to the SRVM.

The prevalent 'blame game' in the case study as well as in the water sector is arguably multi-causal due to complex interdependencies, intergovernmental systems and inter-relationships as discussed in this study. A transdisciplinary approach in defining and solving inherent water access and institutional governance problems could lead to a more holistic thinking needed to narrow institutional gaps. Furthermore, it could also steer institutional administrators towards developing arrangements that work effectively within the limitations and opportunities offered by the existing organisational capacity. NIE argues that where stakeholders' actions are not bound by contract, bargaining is almost impossible, and law and policy do not matter in instances where parties can easily determine and choose water uses with the highest returns (Samuels and Medema, 1998).

8.2.2. Tailor-made Reform Process: A new approach of water governance?

Post-apartheid water policy formulation seems to be over-reliant on a one-size-fits-all institutional reform approach in its quest for achieving equitable, effective, cooperative and integrated water resource management and allocation. However, the policy seems to disregard the influence of inevitable power relations and path dependencies that govern the operations of institutions such as the LSR-WUA. This study argues that establishing WUAs cannot automatically substitute for the domains of relations which existed within irrigation boards. The institutional arrangements that governed the operations of the irrigation boards were designed to attain Pareto-optimal solutions for the commercial farmers. According to institutionalists, a policy and/or institutional reform needs to make productive use of the window of opportunity created by the reform through learning, imitation and hierarchical enforcement (Djelic and Quack, 2007). Imitation in this context implies benchmarking from successful cases nationally and internationally and practicing aspects that apply to the context. According to Nastar and Ramasar (2012: 22),

“Understanding the power dynamics at play in water governance is crucial for interventions for strengthening the objectives of equitable and sustainable water access.”

Prior to transformation, irrigators invested their resources in an effort to shape the direction of the SRIB towards greater profitability and productivity. An institutional reform could not

derail the Association from the vision of the SRIB, nor could it incentivise the LSR-WUA to give the SRVM any institutional arrangement by virtue of the municipality's role in supplying treated water resources to households. The alternative could be adopting approaches that fit the type of institutional problem. This requires factoring in several local and institutional factors and formulating workable policies within that space. This could be done through, for instance, training and organisation of emerging farmers in order to overcome power differentials, as well as through explicit funding to help reduce transactions costs faced by emerging farmers.

Researchers have to develop frameworks within which both water use and water allocation efficiency could be established. According to NIE, it is crucial to recognise and appreciate the interdependencies as well as competitions between and among of economic agents within water resource institutions (Goldin, 2010; Kemerink *et al.*, 2013). This involves understanding the dynamics of water use and distribution at local level. Research should also focus on establishing the socio-economic implications of excluding key players in the water sector in relevant policy processes.

This study focused on the water governance and distribution in the LSRV, using the LSR-WUA as a case study. An extended research, ideally at a doctoral degree level (PhD), comparing and contrasting the governance and performance indicators of the SRVM would go a long way in understating institutional operations and factors affecting equitable, efficient and sustainable distribution of water resources to support socio-economic development within the Municipality. The 'unhappy people-happy plants' paradox will continue to prevail for as long as the factors hindering the efficient and effective operations of the SRVM are not addressed. Further studies could extend this research not only by developing frameworks that combine NIE and public administration comparatives and indicators, but also by establishing the causal links between or among the indicators.

While the conclusions and recommendations of this study are used to address some of the institutional factors discussed in the preceding chapters, it is worth noting that the study appreciates that there is no simple and single answer to address all of the institutional and governance discrepancies discussed in this thesis. In addition to recommending policies

designed to address unique and specific institutional dynamics, the general theme emerging from the study is, “We should stop looking for the magical ingredient and instead focus on getting the mix right!” (Muller, 2008: 15).

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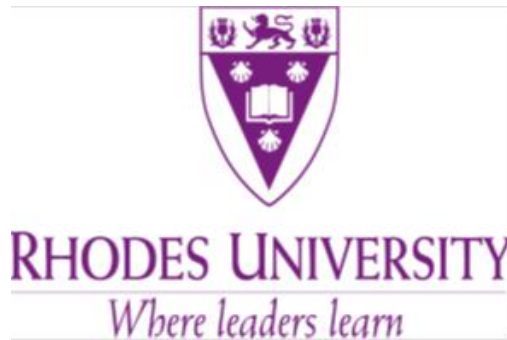
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APPENDIX 1



Department of Economics and Economic History

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KEY INFORMANT INTERVIEW GUIDE

My name is Patricia Madigele. I am a Master of Economics student at Rhodes University. The information obtained from this interview will be used in my study, which is entitled “The Economics of Institutions, Institutional Governance and Efficiency: The Case of Water Distribution in Lower Sundays River Valley”. The primary goal of the research is to explore the link between institutional governance, equity and efficiency in water allocation in the Lower Sundays River Valley (LSRV) with reference to the Integrated Water Resource Management as well as institutional and resource economics paradigms. The information obtained from this interview will be used purely for academic purposes and possibly as input to government policy. Your responses will not be used for any research other than the one indicated. You do not have to answer questions that you do not want to answer. You may end the interview at any time you want to. The proceedings of this interview will be recorded with your approval.

DATE: _____

ORGANISATION: _____

POSITION OF THE KEY INFORMANT: _____

1. GENERAL QUESTIONS

- 1.1. The LSR-WUA is one of the few WUAs that are effectively functioning in South Africa. How was the LSR-WUA formed? Did it help that there was an effective irrigation board? How so? What were the challenges? What contributed to the success of the LSR-WUA?

- 1.2. Subsequent to the transformation of SRIB to LSR-WUA, did the retained staff undergo formal or informal (on the job) training to enable them to perform WUAs duties effectively?

2. EQUITY INDICATORS

- 2.1. What is the percentage of emerging farmers represented in the LSR-WUA?
- 2.2. According to item 4.3 of the constitution, the LSR-WUA is committed to assisting previously disadvantaged communities to gain access to water resources. What have your experiences been of implementing programmes to assist historically-disadvantaged communities in gaining access to water? What sort of resources might help with the implementation?
- 2.3. What has the LSR-WUA tried to do to enhance opportunities for social inclusion or to devise programmes which are more sensitive to local needs? What are the challenges around developing such programmes?

3. EFFICIENCY AND EFFECTIVENESS INDICATORS

- 3.1. Has the LSR-WUA had much input from local residents (that is, commercial farmers, government officials, residents of urban and rural communities in the area)? If yes, in what form? If no, what are the possible reasons? What would help to encourage such interactions? What are the challenges?
- 3.2. The National Water Act of 1998 calls for participatory water resource management. In your opinion, how well do you think the NWA has worked as far as participatory water management is concerned?
- 3.3. How would you characterise the nature of the institutional relationship and practical interactions between the LSR-WUA and the Department of Water Affairs?
- 3.4. What lessons can you pass on to other areas trying to get a WUA established? What could enable their success? What challenges should they anticipate? How should they avoid such challenges?

4. CLOSING QUESTIONS

- 4.1. Do you have any further thoughts of WUAs in general?
- 4.2. Are there other people you think we should talk to?

Thank you very much for your time. Your knowledge and insights will be very helpful to my study.

APPENDIX 2

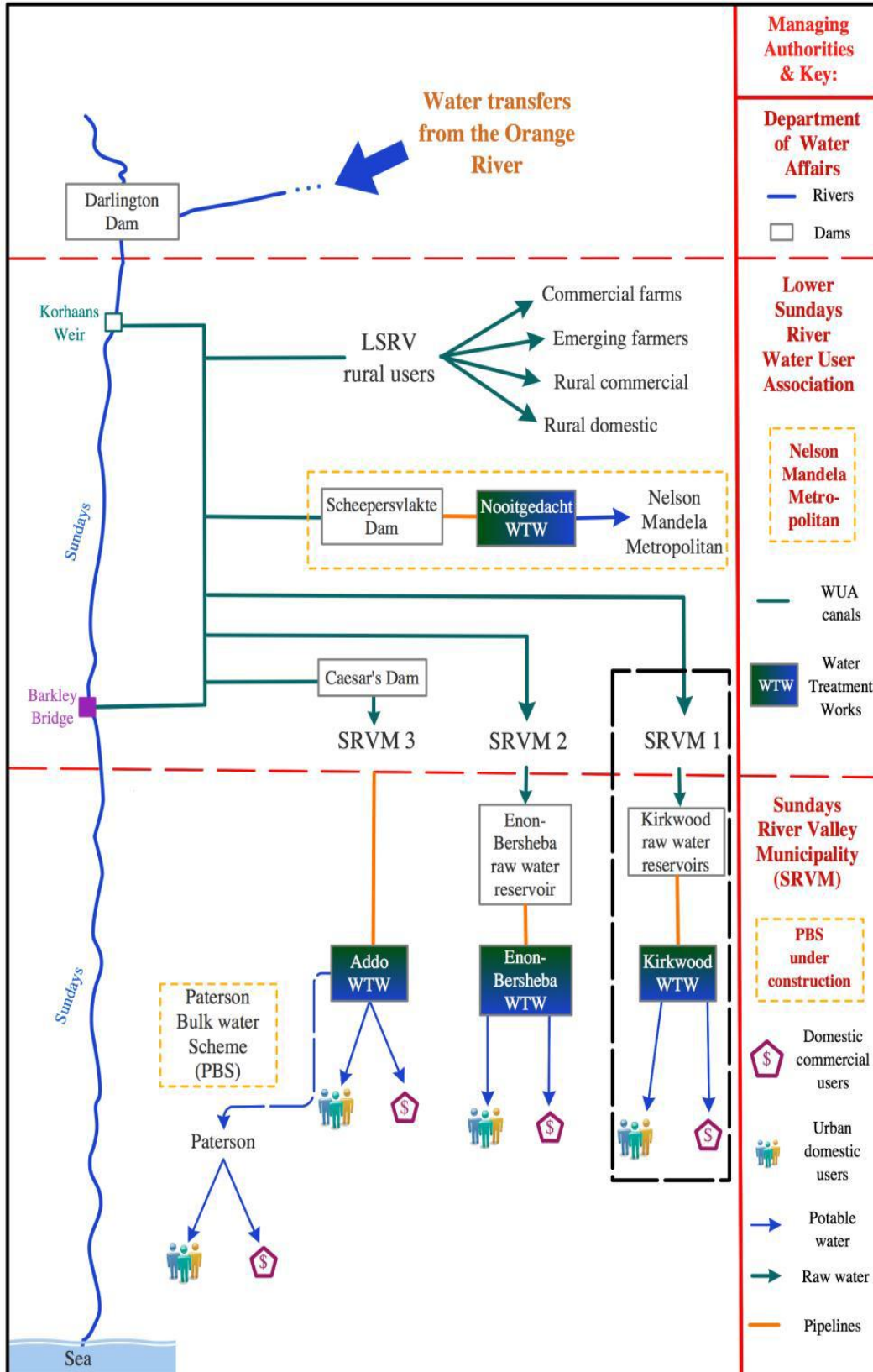


Figure A2: Water supply system of the Lower Sundays River Valley. Source: Clifford-Holmes, 2013