An institutional and political analysis of the establishment process of the Inkomati Catchment Management Agency

By

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DECLARATION

I Terence Kunda Chibwe, declare that the dissertation which I hereby submit for the degree of MSc (Agric) Economics at the University of Pretoria, has not been previously submitted at this or any other university and is the design and execution of my own work and all reference material used herein has been properly acknowledged.

Signature: .....

Date: .....

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To God Almighty be the glory.

ABSTRACT

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The study explores the decentralisation and governance of water resources to the river basin level in South Africa. More specifically, this research project undertakes a case study analysis of the Inkomati Catchment Management Agency (ICMA) which was the first to be established successfully in South Africa. Nineteen Catchment Management Agencies (CMAs) were proposed to be set up in each of the Water Management Areas (WMAs) that were delineated in accordance with the 1998 National Water Act (NWA). Decentralisation of water resources management to the basin level is a relatively new concept to Africa that has taken root in most countries on the European continent such Spain, France, Scotland, Germany and England.

The pace and outcome of the decentralization process in South Africa's water sector has not been satisfactory to many stakeholders. For instance the establishment process of the Inkomati Catchment Management Agency (CMA) took close to seven years, contrary to the expectations of technocrats, politicians and local stakeholders. By 2008 only the Inkomati CMA was fully operational. The study therefore, adapted the methodology that was developed by Kemper *et al.* (2006) and Blomquist *et al.* (2008) in an effort to gain insight into the water reform

decentralisation process. Gaining insight into the water reform process will assist in improving *public policy analysis* as well as the nature and type of strategies that can be advocated to remedy the situation where the reforms are not working well. The methodology by Kemper *et al.* (2006) and Blomquist *et al.* (2008) has been used in several studies in most parts of the world. It is however, the first time the methodology is being applied in an African river basin - Inkomati.

The study investigates the reasons why Inkomati CMA establishment process has been relatively more successful than the other four CMAs in the pilot "water stressed regions". It was hypothesised that the CMA with larger number of and better organised Irrigation Boards (IB) has a better chance to gain support for establishment and continued functioning. The study findings indicate that indeed the Inkomati WMA displays a larger number of IBs that contributed to the successful establishment of the CMA. To date, only two CMAs (ICMA and Breede Overberg CMA) are functional after more than a decade's existence of the new water legislation. The study also shows that a similar statement can be made in the Breede Overberg WMA: there is a positive correlation between the high number of IBs ability and CMA establishment process, demonstrating the instrumental role that commercial agricultural organised interests play in CMAs' establishment process. The study also checked that the Inkomati CMA was actually functioning and performing its responsibilities and that it does not only exist on paper.

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BEE	Black Economic Empowerment
CEEPA	Centre for Environmental Economics and Policy in Africa
CF	Catchment Forum
CMA	Catchment Management Agency
CROC	Crocodile River Operating Committee
CSC	Catchment Steering Committee
DWA	Department of Water Affairs
DWAF	Department of Water Affairs and Forestry
FOA	Food and Agricultural Organisation
GDP	Gross Domestic Product
GWP	Global Water Partnership
ICMA	Inkomati Catchment Management Agency
IWRM	Integrated Water Resource Management
IWEGA	International Centre for Water Economics and Governance in Africa
HDI	Historically Disadvantaged Individual
KOBWA	Komati Basin Water Authority
NWA	National Water Act
NWP	National Water Policy
NWRS	National Water Resource Strategy
NWS	National Water Services
RO	Regional Office
SALGA	South African Local Government Association
UEM	University Eduardo Mondlane
UP	University of Pretoria
WMA	Water Management Area
WB	World Bank
WBI	World Bank Institute
WRC	Water Research Commission
WSPC	Water Sciences and Policy Center
WUA	Water User Association

CHAPTER 1

INTRODUCTION

1.1 BACKGROUND

Of the earth's waters, 97% is sea water and is considered unfit for most human uses and the remaining 3% is what constitutes fresh water. However, 87% of the fresh water is not accessible as it is either locked in polar icecaps or in deep underground aquifers. It is thus, estimated that, approximately 0.4% of this available fresh water is accessible for human use. This water reaches land through precipitation and returns to the atmosphere via evapotranspiration, with the rest being availed as runoff. It is further estimated that 8% of this available fresh water is used by human beings (WBI, 2006).

Consequently, water scarcity has been noticed in most parts of the world. More than two billion people in 40 countries are living in what is typically being referred to as "water stressed" river basins with per capita supply standing at 1700 m^3 per annum (Revenga, 2000). The drastic high demand for fresh water globally has been attributed to increased population growth and economic development over the past century (GWP, 2000). Many regions of the world tend to extract water resources in an unsustainable manner which has led to exploiting ground water aquifers and making inter-basin transfers (CAP-NET, 2003). Due to scarce water resources, conflicts have arisen among different interest groups in river basins and the potential for escalated conflicts still exists (WBI, 2006).

This observed phenomenon is prevalent in South Africa, whose land dispensation since 1913 promoted a skewed distribution and management of the country's natural resources. This meant that there was inequality to access and use of natural resources like land and water. For example, whites in South Africa held large tracks of crown land and possessed rights to use the water resources that were found on this land for their corporate and social activities. On the other hand,

most of the black population was settled on what is commonly referred to as 'former homelands' with low natural resource endowments. In 1996 it was estimated that 40 per cent of the people (16 million people) in South Africa did not have access to clean water for domestic chores and approximately 21 million people did not have sufficient water for sanitary needs (Pienaar & van der Schyff, 2007).

The apartheid policies and institutional arrangements were designed in such a way that they perpetuated discrimination in capturing the benefits that were associated with the resources - land and water. South Africa's water law was based on the riparian rights principle. Centred on the ownership of property, this favoured a selective portion of the population. Legal access to water was thus biased in favour of the interests of the dominant white population (Hirji & Davies, 2009). However, in 1994 South Africa changed its political regime from the apartheid system to that of a democratic dispensation. Thus, the birth of democracy in South Africa raised a new spirit in the political arena with politicians pushing for changes in resource coordination and management by enacting laws and making amendments to the existing water act No. 54 of 1956 that governed water resource management at national level (Ashton *et al.*, 2006).

In the spirit of the new democratic dispensation post 1994, South Africa's new National Water Act (NWA) was crafted in 1998. The enactment of the new Water Law was preceded by the National Water Policy (NWP) (1997) document which had put forward the principles of equality, sustainability, and the efficient and effective use of water in an effort redress inequality to access and allocation of water (RSA, 1997). The purpose of the Water Act is to ensure that the nation's water resources are guided by the fundamental principles of sustainability and equity. As well as to ensure that the water resources are "protected, used, developed, conserved, managed, and controlled, in ways that would take into account among other things: "meeting human basic needs of present and future generations, promoting equitable access to water, redressing the results of past racial and gender discrimination". Whereas the National Water Resource Strategy (NWRS) (2004) provides information about the ways in which water resources will be managed and the institutions to be established as well as providing quantitative

information about the present and future availability of and requirements in the 19 catchments and will be done strategically from a national perspective (RSA, 1997; RSA, 1998; DWAF, 2005). The fundamental principles set out above are to be achieved through the creation of Catchment Management Agencies (CMAs) at the most appropriate level - river basin that will be guided by the NWRS (Pegram *et al*., 2006).

The Inkomati CMA was the first of such a kind to be set up in the country (Chikozho, 2005; Pollard & du Toit, 2011) and it was anticipated at the national level that, it would serve as an experimental basin management agency. The process of establishing Inkomati CMA was initiated through the Department of Water Affairs (DWA)[1]. Karar *et al*. (2011) in their study note that, DWA has been the initiator and driver of CMA establishment process in South Africa. The DWA regional offices gave the necessary technical support that was required to start the decentralization process of water governance to the most appropriate level in the Inkomati WMA. What is more stunning now is that, the experiences of the Inkomati CMA has not given impetus to the formation of many more other CMAs in South Africa. This is despite the fact that four other catchment management areas had also been selected by DWA to constitute five pilot CMA projects together with the Inkomati CMA. Unravelling the factors that influenced the establishment of Inkomati CMA will help mitigate negative factors in the establishment of other CMAs and consequently enhance the establishment process of CMAs in South Africa.

The Inkomati CMA like other CMAs is expected to perform management functions for both water resource use and protection, functions that have traditionally been performed by separate agencies in other countries. The CMA will also take responsibility for the activities that are directly linked to water resource regulation, which also includes authorization of water use and ensuring that similar activities are performed in accordance with the Catchment Management Strategy (CMS) for the CMA (Mazibuko & Pegram, 2006). This possesses several challenges for the

[1] Before the 2009 elections and the subsequent rebuilding of the government, the department was called Department of Water Affairs and Forestry (DWAF)

CMA that has had no prior experience. The CMA has to develop in line with changing basin conditions (socio-economic and political). The Inkomati CMA has to be an “adaptive and learning organisation” which must ensure that “equity and social justice “are met within ecological confines (Rogers *et al*., 2000)

According to Pollard and du Toit (2011), South Africa has embarked upon an ambitious water reform process which emerged from a new, democratic dispensation after 1994, for which it is widely acclaimed. Similarly, Backeberg (2005) notes that, the institutional reform that was initiated after 1994 was as a result of a combination of political, social and economic pressures. Thus the enactment of a new constitution and the democratic election of a new government were the driving force behind the water policy reform and drafting of the new National Water Act (NWA) in South Africa. It is therefore apparent that South Africa’s 1998 NWA Act is considered as one of the most progressive pieces of legislature world over (Woodhouse, 2008). The Act goes a step further by encompassing the four Dublin principles in an effort to manage water resources at the most appropriate level. The four Dublin principles below where the outcome of the International Conference of Water and the Environment (ICWE) held in Dublin, in 1992 (WB, 1993, 2003) – The ICWE principles are as follows:

- **Principle No. 1**

  The river basin is a natural unit of analysis and management. A holistic approach to water management is advocated, i.e. Integrated Catchment Management.

- **Principle No. 2**

  A participatory approach is advocated – all stakeholders (with particular reference to women) should be involved in the planning and management of water resources.

- **Principle No. 3**

  Action should to be taken at the lowest appropriate level (subsidiarity). This will necessitate the devolution/decentralisation of management.

- **Principle No. 4**

  Water has an economic value. Economic instruments should be used to encourage the efficient use of the resource.

It has been observed that the Dublin principles were not incorporated into the 1956 Water Act which continued to guide the coordination and management of water resources in South Africa even into the first four years of democratic governance. Under the 1956 water Act, water resource management was primarily coordinated by the central government through DWA regional offices. The full management costs of water resources were born by central government under the 1956 water Act. Conversely, the 1998 water Act, promulgates the decentralisation reforms which have triggered the formation of Catchment Management Agencies (CMAs) and are expected to be chiefly financed by water use charges in management areas where they will be set up (Wester, 2003).

Decentralisation of water resources management to the basin level and its performance is a relatively new concept to Africa while it has taken root in most developed countries of the Western world in the last fifteen years or so. It has been promulgated through the concept of Integrated Water Resource Management (IWRM) discourse (Dinar, 2007). Basin management is often associated with the concept of decentralization, which entails managing water resources at the "lowest appropriate level"- Catchment Management Agencies (Blomquist *et al*., 2005). Dinar *et al*. (2005) also contend that various reforms in the water sector (including at the river basin level) have been implemented in many countries in recent years.

This wide call for decentralisation reforms to the river basin level has come following the increased awareness and concerns of both policy makers and water

users regarding the state of water. Not surprisingly most literature on the decentralisation of water resources to the basin level covers developed countries of North America, Europe and Australia. There is not much literature covering river basins in Africa. Most recent studies that have been undertaken in African river basins tend to concentrate on participation of stakeholders and challenges of local stakeholder participation (Karar, 2002; Wester, 2003) which will only constitute part of this study focus.

However, South Africa's water reform process has shown that decentralisation is a prominent feature in its reform process. The concept of decentralisation is an integral part of both the National Water Policy (1997) and the National Water Resource Strategy (2004). This is clearly demonstrated through the institutional reorganisation that is set out in the two documents as well as the National Water Act No. 36 of 1998. The documents explicitly state that, the responsibility and authority for water resource management will progressively be decentralised to appropriate regional and local institutions (RSA, 1997; DWAF, 2005).

1.2 PROBLEM STATEMENT

The pace and outcome of the decentralization process in South Africa's water sector has not been satisfactory to many stakeholders (See for example Segal, 2009). Van Koppen *et al*. (2011) attest to the foregoing statement by noting that, in the last 12 years since 1994, very little land and water has actually changed hands due to the slow pace of the land and water reform in South Africa. During the institutional realignment process it was noted that the pace of establishing new organisations in South Africa's water sector is a source of concern and has been slow by any standards (DWAF, 2008a). For instance the establishment process of the Inkomati Catchment Management Agency (CMA) took close to seven years, contrary to the expectations of technocrats, politicians and local stakeholders. To date, less than fifty percent of the nineteen proposed Catchment Management Agencies (CMAs) have been established and are operational though not fully functional (Lotz-Sisitka & Burt, 2006), despite a decade's existence of South Africa's National Water Act (NWA) of 1998. By 2008 only the Inkomati CMA was

fully operational (Colvin *et al.,* 2008). Karar *et al*. (2011) also note that by the end of 2009, only eight CMAs had been formally established and only two governing boards had been appointed. This is despite the high level of political will and enthusiasm exhibited in drafting the Water Act and in the creation of the first Catchment Management Agency (CMA) – the Inkomati CMA (Seetal, 2005). Stakeholders in the Inkomati river basin had participated for over seven years in the ICMA establishment process and resulted in stakeholders beginning to suffer from "participation fatigue" due to the prolonged process (Chikozho, 2005). The momentum seems to have been lost and the decentralisation process appears not to be working perfectly. An institutional review process that was recently completed has recommended that the number of CMAs should not exceed nine countrywide. Hence, further establishment of CMAs has temporarily stalled pending the finalisation of the current review (Karar *et al.*, 2011). Understanding the nature of the problems being encountered in the decentralisation reform process is an area worth exploring. However, it will not be possible to study these problems systematically, i.e. on each and every case because of certain constraints such as time and financial which will be elaborated on in later sections of the study. This study will therefore, focus its effort on the contrast between one successful case and the other ones still lagging behind.

In that respect, it is worth noticing that five pilot 'water stressed' regions were identified as priority WMAs for urgent reform and these include the Inkomati, Olifants, Breede, Crocodile West and Marico, Mvoti to Mzimkulu (DWAF, 2005). The four other pilot regions will potentially be considered for the purpose of comparison with the Inkomati CMA. Mentioning this fact is important since it proves that Inkomati was not the only river basin benefiting from a lot more attention and efforts from the National Government, meaning that the Inkomati was not the only "privileged" case in South Africa water management decentralization process and yet it has been leading this process from the very beginning. The silence in the literature on how the decision was arrived at for selecting the Inkomati Water Management Area (WMA) as the lead river basin for establishing the first CMA is equally intriguing. The Inkomati WMA has been a key site nationally for institutional reform and decentralisation through the establishment of the ICMA - the first in the country (Pollard & du Toit 2011). The

factors and criteria that were considered in the decision making process for this priority status of establishing the Inkomati CMA under the difficult water Act implementation process and who made the decision are still unclear. Loss of institutional memory in DWA due to a high staff turnover limits access to vital information necessary to support empirical evidence (Bourblanc, 2011). It also still remains unclear why the Inkomati CMA establishment process and subsequently its operations have been relatively more successful than the other four "water stressed" pilot regions. For all these reasons, the Inkomati is a case worth studying into detail[2].

1.3 RESEARCH OBJECTIVES

In an attempt to understand the water reform process in the Inkomati river basin and drawing lessons for South Africa's water reform process, the following specific research objectives will guide the study. The first specific objective tries to address the characteristics and problems related to the Inkomati river basin. While the second objective tries to address the characteristics of the decentralisation reform process linked with the Inkomati river basin. The third objective addresses the factors that could potentially help explain this decentralisation process. Whereas the fourth objective addresses the institutional environment and arrangements in relation to how they influence the functioning of the Inkomati CMA. The final objective tries bring to the fore, the functioning of the Inkomati CMA. In that respect:

- Objective 1 is to describe the characteristics and problems related to the Inkomati river basin and to put them into perspective as much as possible with the four other pilot regions. Associated problems include the lengthy delay between the formal establishment of the Inkomati CMA which started in 1997 and its effective operational starting date in

[2]The literature that was reviewed in developing the problem statement did not provide anything substantial on how the Inkomati WMA was chosen as the lead WMA and why the WMA was relatively successful in establishing its CMA. Hence, the interviewees will be asked to comment on these aspects of the study.

2004 which resulted in “participation fatigue” (Anderson, 2005), as well as the challenge of engaging Historically Disadvantaged Individuals (HDIs) in water management at the basin level.

- Objective 2 is to depict into detail the decentralisation reform process linked to the establishment of the Inkomati CMA, i.e. to identify specific organisations and actors who played an important part in the initiation and establishment of Inkomati CMA and understand their particular motivation, to determine the extent of stakeholder participation in the Inkomati CMA formation process.

- Objective 3 is to describe factors that could potentially help explain the decentralisation process in the Inkomati river basin. Such as the initial conditions and contextual factors, as well as the characteristics of the decentralisation process that could have influenced the decentralisation process in the basin.

- Objective 4 is to analyse the institutional aspects related to the Inkomati CMA’s current functioning i.e. to analyse its internal dynamics – politics within the CMA governing board as well as the CMA staff’s links to central and regional government and other local groups i.e. Water User Associations (WUAs) and;

- Objective 5 is to assess how the Inkomati CMA has conducted its operations from the time of its establishment in 2004 to date.

1.4 SIGNIFICANCE OF THE STUDY

The study is intended to improve understanding of the decentralization process in the Inkomati river basin. A well-functioning water reform process has the potential to strengthen democratic ideals upon which the 1998 National Water Act was founded. Developing healthy democratic structures like the Inkomati CMA to manage water resources at the basin level will result in efficient and equitable use

of water resources in a sustainable manner, to meet the demands of present and future generations. Once the CMA is fully capacitated, it will be able to carry out its functions with minimal financial support from government and will subsequently reduce the drain on government treasury.

It has been observed that empirical studies of river basin management systems are used to substantiate purported claims associated with basin level resource management and to explore the factors that seemingly appear to influence its implementation and outcomes (Blomquist *et al*., 2005). Therefore, the findings of the study can be generalised to improve CMA operations and establishment of CMAs in other river basins in South Africa and elsewhere.

1.5 RESEARCH QUESTIONS

The study was guided by the following research questions that were derived from above.

1.5.1 Generic Research Question

Why has the Inkomati CMA establishment process been relatively more successful than the other four CMAs in the pilot “water stressed regions” that where equally given priority status in their establishment?

1.5.2 Sub Research Questions

According to the various actors involved in the selection of the Inkomati river basin as a forerunner, which factors influenced the selection of Inkomati river basin as the experimental river basin?

According to the various actors involved in the establishment of the Inkomati CMA, what factors distinguish the Inkomati CMA from the other 4 pilot regions that were selected by DWA, which can explain the quickest success of the Inkomati CMA in its establishment process as compared to the other two pilot cases?

Since its formal establishment has the Inkomati CMA been functioning according to the expectations that were placed in it?

Are water stakeholders and authorities optimistic about the current level of decentralisation in the Inkomati river basin? What about in the future? Do they believe it is performing in a sustainable way?

1.6 HYPOTHESES

Based on the assumptions stated above the study therefore, hypothesises the following;

1. River basins with big interest stakeholders have generally a tendency of influencing the pace of the CMA establishment process and its subsequent operations because of the organisational capacity that comes with it. Against this background, it was hypothesized that the development and coverage of irrigation boards (IBs) within a basin is a critical factor which determines to a large extent the commercial farmers' mobilisation capacity, and subsequently the support to the CMA establishment process (assuming that commercial farmers do have an interest in supporting such a process because of the mistrust between IBs and DWA and thus the prospects for IBs of being able to side-step DWA's influence with CMAs). Hence the hypothesis that, *the most IBs in a basin, the most chance for a CMA to get support from grass-root level in its establishment process and its later functioning*.

This organisational capacity could be measured through the description of various criteria such as "membership", "financial resources", "social capital" and "mobilisation capacity" characterised through a 5 point scale (from poor to excellent) for a comparative study in the other pilot regions.

2. *Compared to the other four pilot regions, the Inkomati CMA benefited from "better collaboration" (there were minimal lapses in information sharing between the departments) between the Department of Water Affairs (DWA) in Pretoria and the DWA Regional Office (RO) in Mpumalanga province*.

We can characterise this level of collaboration on a 5 point scale (from poor to excellent)

1.7 RESEARCH METHODOLOGY

The study was located within a broader research project, "Water governance decentralization in Africa: a framework for reform process and performance analysis". The part of the methodology used in this study is predominantly qualitative, with very few minor quantitative aspects. The following section describes the methodology in greater detail. Most of the qualitative data presented in this dissertation is drawn from a combination of key-informant and in-depth semi-structured interviews, secondary review of reports, journal articles, policy and law documents review *inter alia*. In the methodology section, a detailed description is given of the methods of data collection and analysis, as well as some of the challenges faced during fieldwork.

1.7.1 Description of inquiry strategy and broad research design

The study applies a case study approach and utilises both secondary and primary data, to solicit key variables to address the set research objectives of the study. Case studies are among several well-tested research designs and techniques that assist to guide a systematic enquiry (Oosthuizen *et a*l., 2005). A common perception of alternative research strategies is that case studies focus on the exploratory and descriptive phases of the research while surveys and the analysis of secondary data are more appropriate for program evaluation and explanatory purposes (Barkley, 2006). Yin (2003) notes, however, that case study methods may be involved in all three roles. The case study approach was selected on the basis that case studies are known to improve understanding of complex issues

and add strength to what is already known through previous research. Case studies are also know to bring issues into context through detailed analysis of a limited number of events, conditions and the relationship that exists between them (Anon, 1997).

Case study approaches have certain limitations which include among others: owing to the small number of cases, they have been criticized to offer no sound grounds for generalizing findings. Case studies are also thought to be biased in their findings and as such are dismissed by others as useful only for exploratory studies (Anon, 1997; Yin, 1984). A common criticism of case study method is its dependency on a single case exploration making it difficult to reach a generalising conclusion (Tellis, 1997).

However, Oosthuizen *et al,* (2005) note that, a case study provides a "detailed and holistic" process that helps to keep an eye on how events in a real-life setup unfold. As such, case studies get in close proximity to the subject of interest as possibly as they can through either direct observation of the natural environment or by access to subjective factors i.e. thoughts, feelings and desires. Therefore, the case is selected because it is an example of an event of real interest. Unlike quantitative analysis, which observes patterns in data at the macro level based on the frequency of occurrence of the phenomena being observed, case studies observe the data at the micro level (Zainal, 2007).

Merriam (1988) also typifies qualitative research as an encompassing concept covering several forms of enquiry that assist to explain the meaning of social phenomena while minimizing disruption to the natural setting and in which much of the focus is on interpretation and meaning. According to Winegardner (2001), qualitative research is flexible and responsive to the changing setting of the study. The author also points out that the sample is usually "non-random, purposeful, and small."

Zainal (2007) notes that one of the reasons for the recognition of case study as a research method is that researchers were becoming more concerned about the limitations of quantitative methods in providing holistic and in-depth explanations

of the social and behavioural problems in question. Through case study methods, a researcher is able to go beyond the quantitative statistical results and understand the behavioural conditions through the actor's perspective. According to Zainal (2007), case study research, can be considered a robust research method particularly when a holistic, in-depth investigation is required.

Thus owing to the qualitative nature of case studies, they seek for depth rather than breadth. According to Merriam (1988), case studies tend to extend the net for evidence broadly, whereas experiments and surveys have a narrow focus. Thus in case studies, several sources of information are required and used because there is no single source of information that can be relied on to provide an all-inclusive viewpoint, hence the need to use a combination of observations, interviewing and document analysis in order to validate and crosscheck findings (Patton, 1990; Oosthuizen *et al.,* 2005).

According to Zainal (2007), one of the advantages of detailed qualitative accounts often produced in case studies not only help to explore or describe the data in real-life environment but also help to explain the complexities of real life situations which may not be captured through experimental or survey research. The case study approach was thus used to describe the decentralization process of water resource management to the basin level in the Inkomati river basin. The case study approach also sought to understand the factors and motivation behind the pioneering establishment of the Inkomati CMA that have contributed to its unmatched successful establishment compared to other WMAs that were equally priotised to set up their CMAs- Olifants, Breede, Crocodile West and Marico and Mvoti to Mzimkulu WMAs.

For the purpose of this study, the case study approach is based on the description of variables highlighting the direction in decentralization of river basin management. This approach does not allow quantifying the impact of a given set of variables on the decentralization process. It is also difficult using this approach to measure the performance of the Inkomati CMA using qualitative data. Although the case study approach is mainly qualitative, it allows describing deeply the decentralization process of a given river basin and explores questions that are

difficult to answer through a more generalized methodology. For example, information regarding the development of changes in water laws and institutional setting seems to be well collected and summarized using the case study approach (Dinar *et al*., 2005). Therefore, the case study approach is being used to understand the decentralization reform processes in the Inkomati river basin and subsequently the functioning of the CMA and its governing board.

The study adopted the methodology that was developed by Kemper *et al*. (2006) and Blomquist *et al* (2008). The methodology was applied and tested in the Inkomati river basin as part of the broader project that was funded by the Water Research Commission (WRC) from which this study was conceptualised (WRC, 2010). The methodology developed by Kemper *et al*. (2006) and Blomquist *et al.* (2008) has been successfully applied in various river basins. It includes among others the Murray-Darling River Basin, in Australia, Alto Tietê River Basin, São Paulo in Brazil, the Fraser River Basin, in Canada, the Tárcoles River Basin, in Costa Rica, the Brantas River Basin, East Java in Indonesia, the Warta River Basin in Poland, and the Guadalquivir River Basin, in Spain. The methodology is a stage based or stepwise method and has three distinct phases.

The first step involves preparation of a background paper in close collaboration with a local expert in the river basin, while the second step involves field work through which primary data is collected and the final stage of the methodology is analysis of the data collected and subsequently preparation of a report. It must be noted that the first stage of the method was used only for the broader project from which this study was conceptualised and hence no subsequent mention of this stage is made in the study. The study only makes use of the second and third phases of the methodology.

The second phase which involved a field visit is intended to gather information from key stakeholders who have worked in government under the previous apartheid regime or continue to work in government in the new democratic government in this case DWA, academic researchers and interviewing different sector representatives as stated below.

The third stage of the methodology is concerned with data analysis which is discussed in detail in Section 1.9 below. The methodology helped to improve our understanding of the decentralization process of water resource management to the lowest appropriate level in the Inkomati river basin.

1.7.2 Selection of the study area

The case study approach was implemented in the Inkomati WMA. The river basin was chosen purposively because the Inkomati WMA was the first to have its Catchment Management Agency (CMA) established in South Africa. The part of the Inkomati river basin which falls mostly in Mpumalanga province of South Africa is the focal area of this study. The river basin was gazetted under the Inkomati Water Management Area (WMA) with the promulgation of the 1998 NWA. Hence, it was anticipated that the chosen study area would offer a good comparison with the other four pilot WMAs that were given equal priority status to have their CMAs established. For a detailed description of the Inkomati \WMA, see Chapter 4 of the study where this issue has been explored.

1.7.3 Sampling of interviews

The sampling procedure that was employed by the study was non- random. The study opted to use the ‘purposive’ sampling method, owing to the nature of information that the study intended to capture. Leedy and Omrod (in Prinsloo, 2008) describe purposive sampling as the method whereby people or other sources of information are chosen for a particular purpose, as the name purposive implies. Twenty five semi-structured interviews with key informants representing the various major stakeholder groups in the Inkomati WMA were conducted. The selection of these interest groups was based on a first round of analysis (physical-economic context) such as the river basin characteristics, contextual factors and initial conditions, characteristics of decentralization process, central-local relationships and capacities.

Semi-structured interviews were conducted with senior staff (key informants) close to or familiar with the process of water management in government and in civil society. Some of the organisations and key informants of interest included the Legal advisor[3] (Mr. J. Boshoff), the deputy director[4] (Mr. Van Aswagen), the chief engineer[5] (Mr. M. Rooyen), the deputy manager water and sanitation[6] (Mr. P.G. Du Toit), the operations & maintenance manager[i] (Mr. A. Themba). The acting director water services division[7] (Mr. S. Zulu), the acting scientific services manager[8] (Ms. Y. Oosthuizen), the programme manager[9], as well as representatives from Irrigation Boards, WUAs and Emerging Farmer Association groups were among others that were equally consulted through conducting semi - structured interviews. Other industry players like, TSB Sugar, Eskom, and mining companies like Fairview mine, which is part of Barberton mines were also interviewed (see attached Appendix F, for summary of main points in interviews). This ensured both spatial coverage as well as demographic and socio economic diversity for the analysis of the study.

1.8 DATA COLLECTION AND ANALYSIS

Data collection and analysis in the framework developed by Kemper *et al*. (2006) and Blomquist *et al*. (2008) centres on four sets of variables that have been identified and established to have a correlation with the dynamics of various decentralization initiatives in the water reform process. The four variables include impact of contextual factors and initial conditions; characteristics of the

[3] Inkomati Catchment Management Agency

[4] Department of Water Affairs (Regional Office Mpumalanga)

[5] Department of Agriculture (Mpumalanga)

[6] Ehlanzeni District local municipality

[7] Bushbuckridge local municipality

[8] Bushbuckridge Water Board

[9] Silulumansi-Sembcorp a private water and sewerage services company

[10] South African Local Government Association (SALGA

decentralization process; characteristics of central government/basin-level relationships and capacities; and internal configuration of basin-level institutional arrangements. For a detailed account for each of the variables, refer to Dinar *et al*. (2005). The study attempted to capture information based on the four variables and the analysis is based on these variables. See also Appendix E for the analysis of these four variables.

1.8.1 Collection methods

The study used some sections of the structured questionnaire in capturing quantitative data such as finances, water tariffs and decentralisation performance (Appendix A) from 3 key informants knowledgeable on these matters. However, in some cases the other sections of the questionnaire only served more as a template that supplemented and guided semi-structured interviews which were more flexible in adjusting to what the interviewee was saying. Most of the findings of the study are based on interviews that were conducted with key stakeholders. Semi-structured interviews helped in understanding the dynamics of the Inkomati CMA establishment process. This included understanding the processes of institutional origin and change within the Inkomati river basin, the incentives of different stakeholders related to such change, and the functioning of water management institutions in the basin. Matters that were closely within the knowledge of the interviewees. Hence, in order to test the hypotheses of the study, we assume that;

1. Actors in the water sector of the Inkomati WMA will have something to say about the other four pilot case studies (Olifants, Breede Overberg, Crocodile West and Marico, Mvoti to Mzimkulu) that have been considered for the purpose of this study.

2. Asking interviewees for the reasons responsible for the slow pace in establishing CMAs in the other experimental pilot sites would help understand factors of success according to decision-makers. It is therefore,

asserted that asking about this phenomenon will assist to put the study on track to determine success factors.

According to Rubin and Rubin (2005), the purpose of conducting an interview is to find out "what happened, why and what it means more broadly…to discover causes and to explain or understand a phenomenon." Research interviews assume that "the individual's perspective is an important part of the fabric of society and of our joint knowledge of social processes and of the human condition" (Henning, 2004). The interview process allowed one on one questioning of key stakeholders in the Inkomati WMA. This presented the opportunity to engage with respondents on a personal level and to record in-depth, spontaneous information on their viewpoints.

The interactions between actors and the common questionnaire that was intended to be used for the study could not address the set objectives, considering the very descriptive and statistic nature of the questionnaire and variables listed under it. Several problems were encountered in administering the questionnaire such as: The original questionnaire contained information that could have been obtained from literature (secondary data). Statistical data aimed at capturing the percentage of water users paying tariffs and the distribution of the annual budget among various activities was equally difficult to solicit from the key informants. The questionnaire also contained some vague questions that would have resulted in vague responses.

A total of twenty five semi-structured interviews were conducted in the Inkomati river basin during the fieldwork period. During the interviews the researcher also interrogated the interviewees about the other four pilot regions in order to put the Inkomati river basin into perspective with the other pilot regions. Though this approach had some risk of introducing potential biases considering the number of interviewees. Other methods of data collection like direct observations were also used through observing daily management practices of the Inkomati CMA officials and how they relate and interact with local stakeholders during the fieldwork period. The researcher also observed the nature and setup of offices for the various organisations that were consulted in order to gain insight on organisational

setup i.e. how staff relate to one another and the power relations in the organisations.

Secondary data was also collected from government reports, unpublished confidential reports, books and other publications such as published peer reviewed journal articles from the World Wide Web. This was the first step in the research process and continued from the start of the study to its conclusion. A systematic perusal of the relevant literature provided information on national water policy and legislation, the biophysical characteristics and history of the study area (Inkomati WMA), and the establishment processes and functions of local water management organisations such as the Inkomati CMA and WUAs. The main advantage of document analyses is that it provides information not easily accessible by other means as well as information that may otherwise have been overlooked. The case study method, with its use of multiple data collection methods and the analysis techniques provides several opportunities to triangulate data in order to strengthen the research findings and conclusions (Anon, 1997).

1.9 DATA ANALYSIS

Data collection in case studies usually involves numerous sources, the process of analysis is therefore, iterative and the style of reporting is both analytic, reflective and with objective interpretation of data (Anon, 1997). The analysis of the Inkomati basin case is therefore based on a combination of sources-secondary sources on South Africa and the Inkomati basin, the background paper prepared for the visit, and the interviews conducted during the site visit. In some cases, some of the secondary sources analysed also included data on the other four WMAs. The findings and conclusions therefore do not represent the point of view of a single individual or organization, but emerge from a composite of data collected and reviewed by the researcher.

1.9.1 Key Variables Considered under each Objective

Objective # 1

Most of the variables under this objective were collected from secondary sources. However, the variables that were not found in the existing secondary data were solicited by use of semi-structured interviews and to a lesser extent the semi-structured questionnaire attached to appendix A. Key variables that were considered under this objective included among others:

1. River basin location and climate
2. Size of river basin
3. Water resource and distribution
4. River basin resources
5. Production value (GDP) generated in the river basin
6. Pollution levels in river basin water resources
7. Water allocation among different interest groups
8. Challenges of engaging stakeholders
9. Power imbalances among key stakeholders

Objective # 2

Key variables under this objective were captured from secondary sources, the survey instrument and semi-structured interviews with key persons. The variables included:

1. Number and types of river basin organizations (RBO)
2. Composition of river basin organizations
3. Process by which governing body of each RBO was selected such as nominated or appointed
4. Level of stakeholder involvement in basin management
5. Motivation of reform in the basin
6. New organizations created
7. Motivation of actors involved
8. Challenges of transforming IBs into WUAs

Objective # 3

This objective utilized information from all two sources namely, secondary sources and semi-structured interviews. The key variables under consideration included:

1. Economic development of river basin
2. Initiation of CMA establishment e.g. organically
3. Devolution of power
4. Financial resources of river basin
5. Local autonomy in institutional reform
6. Attitude of Regional Office staff during the decentralisation
7. Status of water resources in the WMA
8. Political will of government
9. Role of local government and traditional authorities

Objective # 4

The variables that were captured under this objective mainly come from the semi-structured questionnaire and semi-structured interviews. The variables included:

1. Information sharing among RBOs
2. Conflict resolution and coordination
3. Types of water rights
4. Organisations responsible for monitoring and enforcement of water quality
5. Water tariffs
6. Substantial (rather than factual) participation of board members in board meetings
7. Tenure of board members
8. Interaction of CMA staff with other stakeholders
9. Problems encountered in the establishment of the Inkomati CMA

Objective # 5

This objective tries to capture the variables related to functioning of the ICMA from the time of its establishment. It therefore, utilized information from all three sources, similar to objective # 3. The variables included among others:

1. Water allocation problem redress
2. Management of scarce water resources by the Inkomati CMA
3. Conflict resolution in the river basin
4. Implementation of 1998 Water Act
5. Implementation of initial functions

For additional variables that may not have been highlighted in this section for the five stated objectives, the reader is advised to refer to the attached filled questionnaire in the Appendices section (Appendix G).

1.9.2 Analysis method

Based on the data gathered through the various semi-structured interviews in the Inkomati WMA, data was analysed systematically. The study did not perform any statistical analysis, thus no major descriptive statistics were used but instead qualitative analysis using the thematic approach was used. Some of the themes used include the drivers and motivation for the establishment of the Inkomati CMA, decentralisation process of water resource management, water politics, and the transformation of Irrigation Boards into Water User Associations. The analysis method employed was a cross-cutting method which attempted to put into perspective one interview with the other. Tere (2006) notes that, the process of analysing data is iterative, until the researcher is satisfied and that no new issues are arising. The study had also intended to carry out a comparative case study analysis, but was unable to successfully do this, due to limited information that was obtained on the four other pilot regions. Hence this was not a true comparative study but it tried to put into perspective the Inkomati WMA with the other four pilot regions based on the work that has been done by other researchers and the data that was collected through this study.

1.10 ORGANISATION OF THE DISSERTATION

The dissertation comprises of seven chapters that build on one another. Following this introductory chapter, the second chapter reviews literature on water governance and decentralisation from a global perspective. Chapter three follows with a discussion that dwells deeper on the evolution of the water reform process in South Africa by taking a historical review of water rights developments. The fourth chapter provides an overview of the Inkomati river basin by giving the physical description of the basin, water resource availability and the actors in the river basin. Chapters five and six present an analysis of the empirical findings of the study. The fifth Chapter details the implementation process of the decentralisation reforms in the Inkomati WMA by looking at the dynamics during the establishment process of the Inkomati CMA. Chapter six on the other hand, explores the functioning of the Inkomati CMA since its inception and the potential challenges and problems it continues to face. Finally chapter seven provides the conclusions of the study and gives recommendations based on the study findings. It starts by giving a summary of the study and proceeds to highlight the main findings of the study before making the recommendations, limitations of the study and some concluding remarks.

CHAPTER 2

WATER RESOURCE GOVERNANCE REFORMS

2.1 INTRODUCTION

This chapter attempts to explore trends in water resource governance and management to the river basin level on a global scale. It starts by first looking at the concept of water governance. It proceeds to look at the concept of decentralisation of water resource management and then highlights the motivation and theories behind this wide call for the transformation of water resource management to the river basin level which has been spearheaded by developed countries. It also looks at the experiences of decentralised water resource management - success and failure of these broader global policies in the implementation of Integrated Water Resource Management (IWRM) principles. The significance of this chapter is that it sets the scene for the study by highlighting the past and current water reforms and the debate around decentralisation reforms as they continue to be advocated.

2.2 WATER GOVERNANCE: AN OVERVIEW

The concept of water governance has taken on several definitions but the most commonly used definition is the one that defines water governance 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*" (GWP, 2002; Rogers & Hall, 2003). The foregoing definition is similar to the definition supported by Pegram *et al*. (2006) that was developed by UNDP (2006) which states that *"Governance is the exercise of economic, political and administrative authority to manage a country's affairs at all levels. It comprises the mechanisms, processes and institutions, through which citizens and groups articulate their interests, exercise their legal rights, meet their obligations and mediate their differences".*

Therefore, water governance is concerned with those political, social and economic organisations and institutions (and their relationships), which are important for water resources development and management (GWP, 2002). Put more simply, water governance is the set of systems that control decision-making with regard to water resource development and management (Batchelor, 2007). Consequently water governance is much more about the way decisions are made than the decisions themselves (Moench *et al*., 2003).

It has often been observed that because government puts in place the overall laws and regulations, most people therefore, wrongfully assume that the governing of different sectoral water resources is the responsibility of government governance or at least should be done through government governance, which involves management, control, supervision and accountability. In fact Pelgram *et al*. (2006) have observed that governance is often equated with government, a conceptualisation that is not useful in the evaluation of water resource governance. However, managing water resources involves diverse stakeholders at different levels, and therefore both decision-making on allocation and regulation of the water resource goes beyond government governance since government is just one among several societal players (Osinde, 2005). Governance of water resources and water service delivery (GWP, 2002), will require the combined commitment of government and various groups in civil society, particularly at local/community levels, as well as the private sector. Therefore, the setting- up of Catchment Management agencies by government through the 1998 Water Act in South Africa is meant to improve water governance.

However, Pegram *et al.* (2006) point out that, the development and implementation of the necessary regulatory framework to enable the policy and legislation in South Africa has been rather slow due to delays in the following:

- Establishment of CMAs
- Transformation of WUAs
- Establishment of a water resources classification system
- Reallocation of water use entitlements, including compulsory licensing

- Development of catchment management strategies and;
- Authorisation of water use within a catchment paradigm

The delays highlighted above represent some of the core institutional and regulatory essentials that are necessary for a paradigm shift for the water governance system. They further note that, in as much as the practice of water governance (specifically stakeholder involvement and "integrated" planning processes) over the past fifteen years began to adopt many of the principles of Integrated Water Resource Management (IWRM), this has not been fully actualised within DWA.

They further note that water resources management still remains relatively centralised and implemented in a "silo" manner. However they note that the restructuring of DWA has attempted to promote and give practical effect to the governance principles and requirement of the NWA, but this will only take on its full dimension once CMAs are established and functions have been decentralised.

2.3 REVIEW OF PRE-INTEGRATED WATER RESOURCE MANAGEMENT (IWRM) APPROACHES

Prior to the new wave of reforms, water management was typically influenced by scientific and engineering perspectives in both water resources development and allocation. These approaches were found not to be sustainable in many cases (Barrow, 1998). These Water Resource Management (WRM) approaches that were used prior to the IWRM discourse were mostly sectoral management in their approach. Under these approaches, each sector such as domestic use, agriculture, industry and so forth, was managed separately with limited coordination between the various sectors. Uncoordinated and fragmented development of water resources was as result of these approaches. It has been noted that water as a resource by nature flows across sector boundaries. These approaches have proven to be inadequate for global water resource challenges. As water resources became scarce it became increasingly difficult to manage

water efficiently without noticing the interdependence between agencies, sectors and geographical areas (WBI, 2006).

Noticeably, top-down characteristics were a dominant feature in traditional approaches. Central government was responsible for the development and provision of water supplies and regulation of water uses. The effectiveness of this approach has been questioned. It has also been noted that supply management of water resources is also a dominant feature of the traditional approach (WBI, 2006). This is in contrast to the new approach which has a demand management feature anchored in it. Backeberg (2005) also observes that, because of increasing water scarcity, a major shift in policy has occurred from supply management to demand management.

2.4 THE CONCEPT OF DECENTRALISATION

Decentralisation has become a “buzz” word in the recent past. Klugman (1994) asserts that decentralisation has been a popular theme in development thinking and practice in the past two decades. Holmes, Scoones and Pimbert, (in Brown, 2010) also echo a similar view point and assert that there has been a rapid and widespread proliferation of devolutionary approaches to natural resource management on a global scale that seem to suggest positive results in terms of equitable social outcomes and improved environmental conditions. To this end there have been several calls to decentralise natural resources (water) to the local/community level. Hence decentralisation of water resources management to the most appropriate level has been widely advocated for by the Dublin principles (GWP, 2000; ICWE, 1992:4; World Bank, 1993:18 in Dinar, 2007). At the ‘most appropriate level’ Dinar (2007) notes that there is an involvement of stakeholders in the basin including water users.

Ribot (2003) defines decentralisation as “the formal transfer of power from a central government to actors and institutions at lower levels in a political-administrative and territorial hierarchy.” Following the definition given above, it has been noted that the intention of the decentralisation exercise where it has been attempted is to distribute power broadly among locals, those managing the

resources and to increase management efficiency, equity and sustainability (Bohensky, 2006). Under a decentralised set up, there is devolution of powers (authority and accountability) from central government to lower levels of government. Dinar (2007) asserts that decentralization of water resource management from centralized national administration to the basin level is an important aspect of reform agendas. Thus, projects designed with a decentralisation component embedded in them stand a better chance to receive funding from governments of developed countries and international development organizations, such as the World Bank. Dinar (2007) also points out that, where decentralisation reforms have been implemented few documented decentralization reforms of river basin management address process and performance aspects.

Several countries have attempted to implement various types of reforms in the water sector in the past two decades or so. The most common has been the decentralisation of water resource management to the river basin level. This has been necessitated by the realisation and concerns about the state of water by both policy makers and water users. Management of water resources at the basin level entails involving various stakeholders in the river basin in an effort to manage the water resources in a sustainable manner (Dinar *et al*., 2005).

Pegram *et al*. (2006) note that South Africa's National Water Act (NWA) has a logical and integrated governance framework that takes into account issues of participation by formerly disadvantaged groups and the decentralisation and utilisation of the water resources. The Water Act also provides for decentralised institutional arrangements for water resource management to the river basin level, based on the establishment of CMAs.

DWA is in the process of establishing 19 catchment management agencies, each operating in a defined water management area, to manage water resources at a regional level. These agencies will be responsible, among other things, for ensuring that there is agreement between their water-related plans and programmes and the plans and programmes of all other role players in the water management areas. The agencies will consequently have to establish "co-operative relationships with a range of stakeholders, including other water

management institutions, water services institutions, provincial and local government authorities, communities, water users ranging from large industries to individual irrigators, and other interested parties" (DWAF, 2005). This clearly demonstrates that decentralisation of water resource management in South Africa has a legal mandate and support.

2.5 THE CONCEPT OF INTEGRATED WATER RESOURCE MANAGEMENT (IWRM)

Moriarty *et al.* (2004) contend that, Integrated Water Resource Management (IWRM) is being promoted by many organizations, implemented in some areas and piloted in others. Hence great strides in reforming water laws based upon IWRM principles are being made. The study therefore, uses a common definition of IWRM which states that IWRM:

> "... is a process which promotes the co-ordinated development and management of water, land and related resources, in order to maximize the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems (GWP, 2000)".

Based on the above common definition the main aim of IWRM is:

- "to promote more equitable access to water resources and the benefits that are derived from water in order to tackle poverty.
- to ensure that scarce water is used efficiently and for the greatest benefit of the greatest number of people, and
- to achieve more sustainable utilisation of water, including for a better environment (Batchelor, 2007)".

Though appealing, the concept of IWRM has been criticized by Biswaz (2004) who claims that there is a discrepancy between the concept of IWRM and the actual political institutions and property rights. His view is supported by the observation

made by the Global Water Partnership tool box (2003), on IWRM which states that, when policy makers try to put IWRM into practice:

> "they are faced with the apparently insurmountable difficulty of bringing together a very intricate socioeconomic reality, the legacy of the past and its ingrained practices and beliefs, and the apparently non-reconcilable conflicting demands".

However, the ambiguity of the means by which holistic management (such as IWRM) may be achieved does not necessarily suggest that the concept of IWRM should not be promoted nor implemented (Batchelor, 2007). To this end, Integrated Water Resources Management (IWRM) principles are being mainstreamed in water policies, laws and programmes. For instance in Africa, Mali and Burkina Faso, have recently revised their water legislation better to reflect IWRM principles, while Senegal's Agro-Sylvo-Pastoral Policy Act explicitly refers to IWRM as the basis for the national water policy (FAO, 2006).

The story is not any different in South Africa where IWRM principles have been explicitly addressed in several national documents. Such as the new constitution, the National Water Policy and the 1998 National Water Act which is the principal legal instrument relating to water resource management and the National Water Resource Strategy (NWRS) which provides the framework within which water resources will be managed in South Africa (RSA, 1997; RSA, 2008). Pegram *et al*. (2006) note that, South Africa's 1998 Water Act requires the preparation of catchment management strategies by CMAs as stipulated in section 8 of the Water Act. This is in line with the principle of IWRM, which requires water resource management decisions to be devolved to the most lowest - appropriate level. Thus, South Africa's 1998 Water Act is now upheld as one of the most progressive pieces of legislature world over.

The significance of advocating for an integrated approach to water resources management is discussed in the National Water Policy. However, the concept is also explicitly acknowledged in the Preamble to the Water Act, which recognises that water occurs in many different forms which are all part of a "unitary, inter-

dependent hydro cycle". The Preamble furthermore recognises the need for the integrated management of all aspects of water resources (DWAF, 2005).

2.6 CASE STUDY EXPERIENCES OF DECENTRALISING TO THE CATCHMENT LEVEL

It has been noted above that decentralisation of water resource management to the river basin has been attempted in some countries especially in the developed part of the world. The following is a discussion of some selected case studies where water resource management has been decentralised to the river basin level.

2.6.1 The Case of Vietnam

Water resources in Vietnam are considered abundant in terms of capacity, yet the same water is not readily available for use due to its uneven distribution. A marked shortage of fresh water in certain areas has been observed and is attributed to factors such as pollution, erosion, flooding and drought. This has led to deterioration in water quality and resulting in damage to the environment. Water loss through wastage as high as 50% has been recorded in some cases (Jordan, 2003) However, water resource management in Vietnam has improved remarkably in recent decades owing to new legislation that was promulgated in 1998. Thus, institutional changes in water resource management have encouraged decentralisation and stakeholder involvement in the abstraction and protection of water resources for irrigation as well as water meant for domestic purposes (Viet Dung & Dahn Tinh, 2006).

Literature indicates that experience in natural resource management in Vietnam has strongly recognised and valued the role of local communities, which have been acknowledged not only as direct users but also as direct and significant administrators and protectors of water resources. Community based management has been introduced and adopted in many areas in different ways particularly in regards to drinking and irrigation water. Despite the insufficiency in legislation,

institutions and capacity, local communities have shown that water resources would be better managed if there were community participation in the decision-making process. To date, still, there has only been little comprehensive research or assessment on community-based management of water resources (CWRM) in Vietnam. This negative development has unfortunately limited the efforts to develop and disseminate understanding and insights into Vietnam's CMWR as well as effectively promote its application in practice (Viet Dung & Dahn Tinh, 2006).

2.6.2 The case of Morocco

Morocco is faced with scarce water resources combined with a rapid population increase, urbanization and industrialization which makes water a contentious issue with 42% of the rural population lacking access to potable drinking water. Agriculture uses approximately 92% of the country's dwindling water resources. There are large variations in water resources inter-temporally and spatially make sustainable management of water resources a key issue. Challenges include the implementation of a water reform decentralizing financial and planning authority for water resources to nine river basin agencies to be created incrementally (UN-Water, 2008).

However, an improvement of institutions and policies for water resources management following Integrated Water Resource Management (IWRM) principles has been noticed. Best practices in water resources management are being developed and disseminated. The involvement of non-governmental organisations in water resources management has equally increased. Some pilot projects have been undertaken in Morocco and the results show that for instance in one of the river basins the Soussa -Massa River Basin Agency has been established and is operating according to IWRM principles. There is cooperative governance and participation of private water user associations when making management decisions. National and regional institutional responsibilities have been defined and consolidated. Procedures for allocation of water were established together with technical capacities to allocate and monitor water

quantity and quality and mechanisms for communication between sectors and agencies. Consequently in the Nakhla watershed soil loss has significantly reduced through soil conservation measures as a result of implementing the IWRM principles (UN-Water, 2008).

2.7 SUMMARY

Water governance is concerned with the political, social and economic organisations and institutions as well as their relationships. Thus water governance looks at the way decisions are made in the water sector. It requires the combined commitment of government and other interest groups in civil society. There has been a shift from the way water resources were managed in the past. In the past each sector managed its water resources in isolation thus not having a well coordinated management process and this led to the mismanagement of water resources in some cases.

However, a new outlook in the water sector has developed on the water front which requires the use of decentralised approaches to the management of water resources. Hence Integrated Water Resource Management principles are being advocated by most governments from the major developed countries as the most favoured approach to water resource management. Thus decentralising water resource management to the river basin level has become a widespread phenomenon. Experiences in some countries where the decentralisation reform process to the river basin level has been implemented shows that there have been notable changes in the way water resources are being managed.

CHAPTER 3

EVOLUTION OF THE WATER LAW AND REFORM PROCESS IN SOUTH AFRICA

3.1 INTRODUCTION

The purpose of this chapter is to give an account of the evolution of the water reform process in South Africa. It first gives an overview of the water sector in South Africa and then narrows down to focus on water reform evolution in South Africa by giving a detailed historical and contemporary account of the reform process in South Africa's water sector. A thorough review of literature was conducted in an effort to provide clear insight on the reform process. The chapter also provides an overview of the time line on the formation of the Inkomati Catchment Management Agency in the Inkomati Water Management Area. The chapter brings the Inkomati CMA into context which is important in understanding the implementation of the decentralisation reform process and the extent to which the results of the study can be generalised.

3.2 OVERVIEW OF SOUTH AFRICA'S WATER SECTOR

3.2.1 Physical availability of water resources

South Africa is considered as a semi-arid country that is water scarce with a variable annual average rainfall of about 450mm, which is far much lower than the world's annual average of 860mm (RSA 1997). Streams tend to flow at low levels with soaring seasonal, inter-seasonal as well as spatial variability. Ground water is equally scarce considering that most of the country is underlain by hard rock formations which lower the potential of ground water aquifers to contribute substantially to economic activities (Karar, 2002). South Africa's existing water resource availability comprises 77 percent surface water, 9 percent groundwater

and 14 percent re-use of return flows. Water availability currently and in the future will remain heavily dependent on climate, water use and management and land-use practices. Consequently, South Africa is listed on the top twenty countries with the most scarce water resources (Pienaar & van der Schyff, 2007). This has prompted South Africa to shift its water resource management from supply management to that of demand management (Roux, 2009).

3.3 DEVELOPMENT OF WATER LAWS IN SOUTH AFRICA - A HISTORICAL PERSPECTIVE

The historical context of water rights in South Africa serves as an interesting background in understanding the decentralization process of South Africa's water sector. Knowing the history (path dependency) of water rights can enlighten us on how events from the past have continued to shape the outlook of the future on the water front. History also helps us to explain the institutional transformation and is necessary to track the incremental evolution of institutions. Path dependency is an important feature in the development of social and political institutions (Kirsten *et al*., 2009). Each institutional path is characterized by a set of constraints and incentives that produce characteristic strategies and shared decision rules, which in turn produce a patten of behaviour among actors (Thelen, 1999). Historically water has always played an important role in shaping South Africa both demographically and politically (Turton *et al*., 2004). Prior to the 1994 democratic elections, South Africa was under an apartheid and authoritative regime. Under this regime, racial laws were also extended to the water sector (van Koppen *et al.*, 2002).

Regulation of water use in South Africa can be divided in two distinct phases. The first phase being the period from about 1652 up until about 1876. The history of the legislative aspects concerned with water dates back to the settlement of Europeans in 1652. The legislative evolution of South African water law is therefore, traced back to the Dutch settlers who established a permanent colony at the Cape of Good Hope in 1652 (Rowlston *et al*., 2000). There is however, limited evidence, if anything at all, regarding the traditional "legislation" surrounding water

resources in South Africa (Ashton *et al*., 2005). Tewari (2009) states that before the arrival of the settlers (both Dutch and British), water rights under African customary law were unwritten and was only considered important when a community came under threat from another encroaching tribe. According to Ashton *et al*., (2005) the South African water law is the product of different law systems: namely English, Roman, Roman-Dutch Law and even American. The rules of these systems sometimes clashed and led to great misunderstanding for both implementers and beneficiaries of the law.

Under Roman law, a distinction was drawn between a river (*flumen*) and a stream (*rivus*). A stream did not have much water in it, or did not flow as often as a river. The more permanent and larger streams were therefore called *flumines.* The water in a *rivus* could be used privately and was linked to private property. The owner of such a property was allowed to use the water. The water in a *flumen*, on the other hand, was seen as *res communis*. This meant that the water, under certain limitations, was there to serve the joint needs of the riparian owners. This joint utilization meant that the river could be navigated and that the owners had a right to use the river's water for domestic purposes and water for irrigation purposes was more prioritized (Guildenhuys, 1970).

However, under the Roman-Dutch law principle of *dominus fluminus* all land was held in freehold and the State had ownership of all water, and absolute control over its use. In 1814 the Cape became a British crown colony. The State played only a limited role in water resources development, which was dominated by private agrarian developers primarily concentrating on irrigation advancements. Village and town authorities were fully responsible for the water supply and sanitation needs of local inhabitants (Rowlston *et al*., 2000).

The second phase is considered to be the period from 1876 to up until when the 1998 water Act was enacted. During this period the principles adopted for the distribution of water were entrenched in the English law. The provisions of these new principles were set for riparian owners to share the water in the river that ran alongside or over their properties. They further instituted the ownership of spring water that was found on their land - riparian owners. The state no longer played a

dominant role in the allocation and development of water resources (Pienaar & van der Schyff, 2007).

Bell and Hall (in Turton *et al.*, 2004) describe the developments of water law in the second phase of water law evolution. In 1876, the Right of Passage of Water Act (Act 24 of 1876) was passed. This Act did not deal with water rights as such, only with servitudes. Its aim was to facilitate the use of water when the right to water use was undisputed. It provided that persons having a right to the water of "springs, dams, reservoirs, or any other sources should be entitled to take that water through the property of others to enable them to use it for irrigation or for the use of hydraulic works.

In 1882, Act 26 of 1882 was passed by the Cape parliament. This Act repealed Act 24 of 1876. The preamble of the Act stated that the previous Act (24 of 1876) was insufficient for its purpose and had led to considerable litigation. This Act also remained in use until the codification of the irrigation law of the Cape Colony in 1906. Thus, in 1906 the Irrigation Act No. 32 was passed in the Cape Colony. This Act was mostly concerned with issues of water administration.

In 1912 the Union Irrigation and Conservation of Water Act No. 8 was successfully enacted by the South African parliament. This Act was the first legal instrument, which regulated the use of water in public streams. The introduction of the 1912 Water Conservation Act, made the distinction between private and public water clear. It gave powers to land owners to preside over spring water on their land and water that was flowing on their property with a condition that the water could also be used by other users downstream if the water flowed over their land as well. Water in public streams was considered as public water and as such the riparian owner had no right over the public water. It was not known with certainty who held property rights to water that was considered private (Pienaar & van der Schyff, 2007). This act meant that commercial farmers who were predominantly white, the mining sector, industries and tourist companies that were equally controlled by whites would stand to benefit under this Act. The Act marginalised blacks residing in homelands owing to the riparian principle that was enshrined in the Water Conservation Act of 1912 (van Koppen *et al*., 2002).

However, in 1934, the South African parliament passed Act No. 46, which amended the irrigation Act No. 8 of 1912. Specifically this Act regulated the construction of large storage works by stating that the construction of large storage works within a protected area could only be carried out after permission from the Minister of Irrigation. However, in 1956 a new Water Act was passed, just like the Water Act that preceded it, Water Act (No.54) of 1956 also upheld the distinction between public and private water.

Macray (2003) notes that, the 1956 Act still focused very much on development of water resources, and like the previous Water Acts, it gave much attention to providing and allocating water for development in the agricultural sector. This was related to the historical political power base of the National Party in the commercial agricultural sector, and possibly also to the policy of discouraging migration away from rural areas to urban areas. Bate and Tren (2002) note that, the South African government became involved in irrigation from the beginning of the 20th century. This involvement, through legislation and financial support, increased after every major crisis and subsequent report.

Apparently Water Act No.54 of 1956 was also vague over the matter of, who the owner of private water was. Riparian owners under this Water Act had the right to use water in public streams but the state continued with its role of controlling use-rights and policing (Kidd, 2009; Pienaar & van der Schyff, 2007). The trend of centralisation of government decision-making power was still evident. According to (Bate & Tren, 2002), the history of South African water legislation shows changes and constant conflict of interests between the state and the public in terms of water use and management. They identified dominant players that were involved in this tension as the state and the agricultural sector who were later joined by the industrial sector. They note that during British rule, local authorities were fully responsible for water supply and sanitation requirements for local inhabitants and as such it was not the responsibility of the central government. Water management decisions were taken locally and the sustainability of water resources depended on how local communities were managing the resource. This

trend was also observable during the reign of the Union of South Africa in which the role of the state was “limited to irrigation activities.”

Macray (2003) notes that, the 1970 Commission of Enquiry into Water Matters highlighted many of the issues that were becoming evident during the1950s and 1960s. The Commission of Enquiry played a pivotal role in initiating changes, through the subsequent creation of the Water Research Commission, and research programmes into system-wide water resources management problems and issues, such as eutrophication, inter-basin transfers, and reservoir management. This work underpinned much of the development of knowledge related to water resource management, which in turn is reflected in the 1997 water policy and the 1998 National Water Act. Interestingly, the 1952 and 1970 Commission submitted a minority report in favour of “regional boards” (Bate & Tren, 2002). However, it is not clear whether such “regional boards” were meant to espouse hydrological boundaries like in the concept of catchment management agency and decentralise water resources management or if what was intended was only a kind of deconcentration of responsibilities to regional offices of the Department of Water Affairs at the provincial level, the management of water resources remaining in this latter case fairly centralised.

3.4 POLICY REFORMS AND LEGISLATION IN THE WATER SECTOR OF THE NEW DEMOCRATIC SOUTH AFRICA

3.4.1 National Water Act (No. 36) of 1998

In an effort to redress racial imbalances that were perpetuated under apartheid South Africa, the new democratic government instituted ambitious reforms in various sectors of the economy. The water sector was prioritized in implementing the new reforms. Thus Water Act No. 54 of 1956 was replaced with the new 1998 Water Act (Act No 36). South Africa’s National Water Act (NWA) No 36 of 1998 is premised on the 1997 National Water Policy (NWP) proposal as described in the White Paper. The White paper was developed through wide consultations by government and other interest groups and was later summarised in to legislation

(Van Wyk, 2001). Therefore, the White Paper serves as the foundation of the 1998 NWA. According to Hirji and Davies (2009), the 1997 White Paper and the 1998 legislation are the fundamental statements of water policy in South Africa and, as such, cover a variety of topics related to the objectives and mechanisms for water planning and management. The two documents are consistent with the South African Constitution Section 24 of the Bill of Rights, which gives all South Africans the right to an environment that is “not harmful to their health or well-being,” as well as the right to have the environment protected for the benefit of present and future generations. The white paper on National Water Policy for South Africa (RSA, 1997) sets a framework for institutional reform in the water sector.

The White Paper on National Water Policy states “that the National Government is custodian of the nation's water resources and its powers in this will be exercised as a public trust" (RSA, 1997).The White Paper further goes on to state that DWA is the primary agency responsible for water resources management. In exercising its mandate, DWA must reconcile, integrate and coordinate diverse and often conflicting interests of different stakeholders, within the framework of sustainable and equitable utilisation of South Africa's water resources.

The objective of the White Paper was to set out the policy of the Government for the management of both quality and quantity of South Africa’s scarce water resources. This policy was one step in the process of reviewing the 1956 Water Act and the current practices and institutional arrangements for water management in the country. Both the White Paper and the review of the Water Law reflected the urgent need for change in this field, and the high priority given to appropriate water management by the national Government.The purpose of the White Paper was to:

- “provide some historical background regarding access to and the management of water in South Africa;
- explain the current development context in which South Africa finds itself;
- explain the environmental and climatic conditions which affect the availability of water in South Africa;

- put forward certain policy positions, based on the Fundamental Principles adopted by the Cabinet in November 1996;
- outline the proposed institutional framework for water management functions;
- outline the steps which would follow the publication of the White Paper in order to translate the policy into law and action"

After the White Paper had been accepted the second most important step was to draft a National Water Bill based on the policy positions that were contained in the White Paper document (RSA, 1997). Thus in 1998 the NWA No. 36 was passed and is the principle legal instrument for water resource management in South Africa. Chapter 1 of the Water Act sets the fundamental principles. Sustainability and equity have been identified as the central guiding principles for the "protection, use, development, conservation, management and control" of water resources in the country. Hence, the purpose of the Water Act is to ensure that the nation's water resources are protected, used, developed, conserved, managed, and controlled in ways which take into account amongst other factors –

(a) meeting the basic human needs of present and future generations;
(b) promoting equitable access to water;
(c) redressing the results of past racial and gender discrimination;
(d) promoting the efficient, sustainable and beneficial use of water in the public interest;
(e) facilitating social and economic development;
(f) providing for growing demand for water use;
(g) protecting aquatic and associated ecosystems and their biological diversity;
(h) reducing and preventing pollution and degradation of water resources;
(i) meeting international obligations;
(j) promoting dam safety;
(k) managing floods and droughts;

In order to achieve the above, suitable institutions need to be established that guarantee appropriate community, racial and gender representation (RSA, 1998).

The Water Act also highlights government's responsibility regarding the country's scarce water resources in terms of the utilisation and management of this scarce water resource. The Water Act also stipulates that the end purpose of water resources management in South Africa is the sustainable use of water to the benefit of all users.

The 1998 Water Act has therefore, led the way in the international wave of reforms in the water sector (Woodhouse, 2008). The 1998 Water Act has been plaudit and is regarded as one of the most progressive Water Act in the world (Movik, 2009). Under the Water Act the country was divided into nineteen Water Management Areas (WMAs). Each WMA is to be managed by a catchment management agency (CMA). These are new forms of institutional arrangements that are as a result of the new Water Act.

The NWA provides for the phased establishment of Catchment Management Agencies (CMAs) to undertake water resources management in defined WMAs. CMAs may be responsible for implementing the statutory provisions of the NWA, as well as developing and implementing catchment management strategies in their WMA. The requirements for establishing CMAs, together with an overview of evolution of these organisations, have been explored in *Guides for Establishing CMAs and WUAs* (DWAF, 2000).

3.4.2 Catchment Management Agencies

The NWRS (2004) states that catchment management agencies are statutory bodies that will be established by Government Notice. They will have jurisdiction in defined water management areas, and will manage water resources and co-ordinate the water-related activities of water users and other water management institutions within their areas of jurisdiction. Pegram and Palmer (2001) note that the minister may establish water management institutions such as CMAs to support the DWA in exercising its mandate. Therefore, one of the important facets in the 1998 Water Act of South Africa as noted above is the provision for the progressive establishment of CMAs as outlined in Chapter 7, Section 77 of the

1998 National Water Act (RSA, 1998). The purpose of establishing CMAs is to decentralize water management from central government to the most appropriate level (river basin level) thus incorporating local users in decision making, as noted in section 2.4 of Chapter 2.

According to (Mazibuko & Pegram, 2006), a CMA has a specific mandate that it should fulfill within its specified WMA. This mandate includes:

- Developing a Catchment Management Strategy (CMS) as a framework for management of water resources within the WMA, which must be in harmony with the National Water Resource Strategy (NWRS) – the national framework for the management of water resources in South Africa
- Coordinating the other Water Management Institutions (WMIs) within the WMA
- Ensuring sustainable water use
- Promoting cooperative governance
- Promoting community participation in Water Resource Management (WRM)

Figure 3.1 below summarises the various roles and purpose a CMA once established.

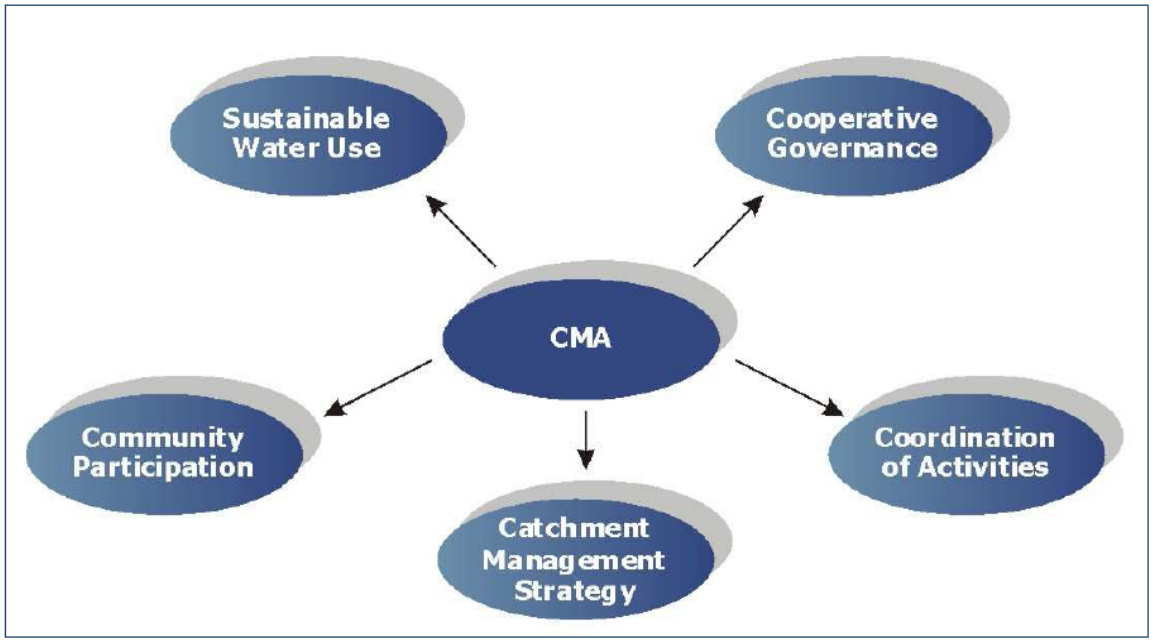

Figure 3.1: Roles and purpose of a CMA

Source: Mazibuko and Pegram (2006)

Similarly to the above Karar *et al.* (2011) note that the logic behind the setting up of CMAs in South Africa was that through decentralised resource management, stakeholders especially those that are were previously excluded from access to water and its derivative benefits should be able to participate in water resource management decision making.

There are two models in which a CMA in a Water Management Area (WMA) can be set up according to article 78 of the Water Act. The first option involves the minister responsible for water affair using his discretion – based on recommendations from DWAF in line with the National Water Resources Strategy (NWRS). The second option is where, the minister acts after receiving a proposal that has been developed by stakeholders in a WMA (Mulder, 2005; DWAF, 2005). The first option represents a top-down approach where as the second option is representative of a bottom up approach though it can also be driven from the top as shown in this study.

After the CMA has been established part 2 of the National Water Act requires "every catchment management agency to progressively develop a catchment management strategy for the water resources within its water management area. Catchment management strategies must be in harmony with the national water resource strategy. In the process of developing this strategy, a catchment management agency must seek co-operation and agreement on water-related matters from the various stakeholders and interested persons. The catchment management strategy, which must be reviewed from time to time, will include a water allocation plan. A catchment management strategy must set principles for allocating water to existing and prospective users, taking into account all matters relevant to the protection, use, development, conservation, management and control of water resources (RSA, 1998)."

3.4.2.1 Water User Associations

Structured under the CMA is a third tier of management: the Water Users Association (WUA). A WUA falls under the authority of the catchment management agency in whose area of jurisdiction it operates to the extent that the agency has received delegated powers from the Minister to direct the WUA's activities. As such an association may receive delegated powers and duties from, or be contracted by, the CMA to undertake activities that are within its capacity to perform. The content of the WUA's constitution must, if necessary, be amended to reflect the delegated or contracted activities.

“Although water user associations are water management institutions, their primary purpose, unlike catchment management agencies, is not water management. They operate at a restricted localized level, and are in effect co-operative associations of individual water users who wish to undertake water related activities for their mutual benefit” (RSA, 1998). However, there is no clearly prescribed task division between the CMA and the WUA as yet.

The WUAs operate at a local level as cooperative associations of individual water users who wish to undertake water related activities for their mutual benefit. A CMA may delegate or contract specific functions to a WUA (Chikozho, 2002; Pegram & Palmer, 2001). They are meant to replace the Irrigation Boards and any other local water management institution which include among others subterranean water control boards and water boards established for stock watering purposes in terms of the 1956 Water Act. WUAs can be newly established for specific water management tasks or sectors. New water user associations may be established for any purpose, such as, for example, the use of water for recreational purposes. Local management by water user associations may also be appropriate in areas where there is extensive reliance on groundwater, especially where the systems are stressed. It is, however, expected that the majority of associations will continue to focus on the use of water for agricultural purposes (DWAF, 2005).

It was envisaged that almost 300 existing organisations countrywide would be transformed into WUAs by the end of 2006. “In essence the transformation of the irrigation boards means that they should reform their operational area and management structure to be more representative of the demographics of the area, in terms of race and gender” (DWAF, 2001). The proposal to transform an existing body to a water user association should be developed in consultation with individuals and organisations likely to be affected. It must thus contain, among other things, information about the proposed activities and the area in which they will be undertaken, a proposed constitution and details of proposed members of the association (DWAF, 2005). In the Inkomati river basin steps have already been taken to transform irrigation boards into WUAs (Waalewijn, 2002).

3.4.3 The National Water Resource Strategy

The National Water Resource Strategy (NWRS) is the implementation strategy for the National Water Policy (NWP) and the National Water Act 36 of 1998 (NWA). It provides the framework within which the water resources of South Africa will be developed and managed at present and in the future (the next 10 to 20 years). It also provides the framework within which water will be managed at regional or catchment level, in defined water management areas. All authorities and institutions exercising powers or performing duties under the 1998 NWA must give effect to the NWRS. This strategy sets out policies, strategies, objectives, plans, guidelines, procedures and institutional arrangements for the protection, use, development, conservation, management and control of the country’s water resources. One of the important objectives of the National Water Policy is progressively to decentralize water management responsibilities (DWAF, 2002). The first edition of the NWRS was accepted in 2004 by the cabinet and was subsequently published in the Government Gazette 27199 dated 28 January 2005 (Thompson, 2006).

The first Chapter of the NWRS is concerned with water policy, water law and water resource management. The relationship between the constitution of the Republic

of South Africa, the NWP and the NWA are described together with the purpose of the NWRS as:

- "the National framework for managing water resources;
- the framework for the preparation of catchment management strategies in a nationally consistent way;
- information, in line with current legislation, regarding transparent and accountable public administration; and
- the identification of development opportunities and constraints with respect to water availability (quantity and quality)" (DWAF, 2004; Thompson, 2006).

3.5 DECENTRALISATION OF WATER MANAGEMENT TO THE CATCHMENT LEVEL IN SOUTH AFRICA

There have been notable changes to the institutional environment and arrangements governing water in recent years. The nature and direction of these institutional changes are being determined by the political, economic and resource endowment of the respective countries attempting the reforms (Saleth & Dinar, 1999). South Africa is one such country that has attempted to make changes to its institutional arrangements in the water sector. South Africa's National Water Act (NWA) No 36 of 1998 is premised on the 1997 National Water Policy (NWP) proposal. The NWP adopted by cabinet was in response to the new direction that was set by government and as part of a comprehensive evaluation of the existing water laws. Implementation of the NWP was expected to change the ways in which South Africa's water resources are managed (Rademeyer, n.d.). The NWP (1997) endeavours to bring about equity to access and participation as well as the establishment of new institutional arrangements in managing and developing of South Africa's water resources (RSA, 1997).

Decentralisation of water resource management in South Africa is part of a major shift from the past authoritative approach in water management that had bureaucratic elements, substantial dependency on technology, highly inequitable policies with frequent disregard for substantial hydrological, ecological and social

variability in the system (Rodgers *et al.*, 2002). One of the 1998 Water Act's main objectives is to progressively decentralise the responsibility and authority for water resources management to appropriate regional and local institutions in order, among other things, to enable water users and other stakeholders to participate more effectively in the management of water resources (DWAF, 2005). It has been noted that, decentralisation will play a significant role in ensuring the involvement of all stakeholders in the management of water resources in the river basins - Water Management Areas (WMA) by devolving power to Catchment Management Agencies (CMAs) that will be responsible for managing water resources at the basin level where they will be setup (Mulder, 2005). There are four stages that have been identified in the establishment of CMAs in South Africa. They include initiating participation; formalizing participation; interim management arrangements and the formation of the CMA and subsequently the appointment of its governing board (DWAF, 1999).

3.5.1 An Overview of the Inkomati Catchment Management Agency (CMA) Formation Process

3.5.1.1 Inkomati CMA time line and structure

The formation of Inkomati CMA followed a time line as indicated in the schematic presentation in Figure 3.2 below. The engagement of stakeholders in the CMA proposal process began before the 1998 Water Act was promulgated as indicated in Figure 3.2 below. The reference group (representatives from the three catchment forums) finalised the proposal and submitted it to DWA in Sept 2000. It took quite some time before the reference group could meet again. The time that had elapsed and the notable lack of progress in establishing the CMA was of concern to many of the stakeholders. To this end the DWA Institutional Oversight Directorate in Pretoria contended that initially it was “too optimistic” in believing that the Act could be implemented quickly (DWAF, 2001.).

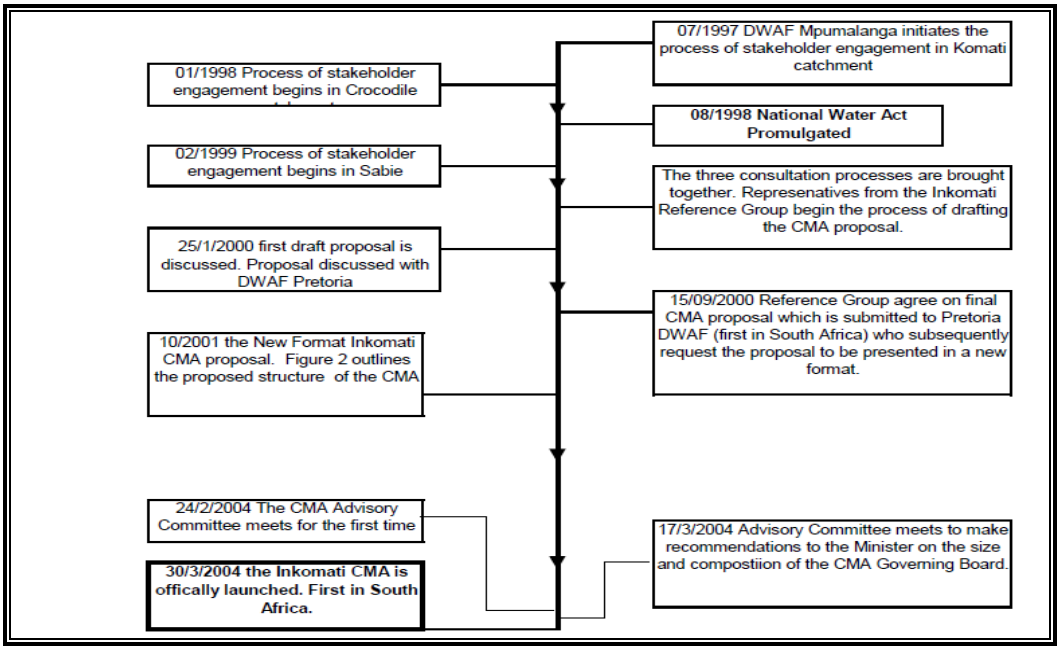

Figure 3.2: Time line of Inkomati CMA formation process

Source: Brown and Woodhouse (2004)

Figure 3.3 below shows the Inkomati CMA structure and the various support organisations and the various relationships based on the time line above. The direction of arrows in the figure shows the flow of information in the new institutional arrangement.

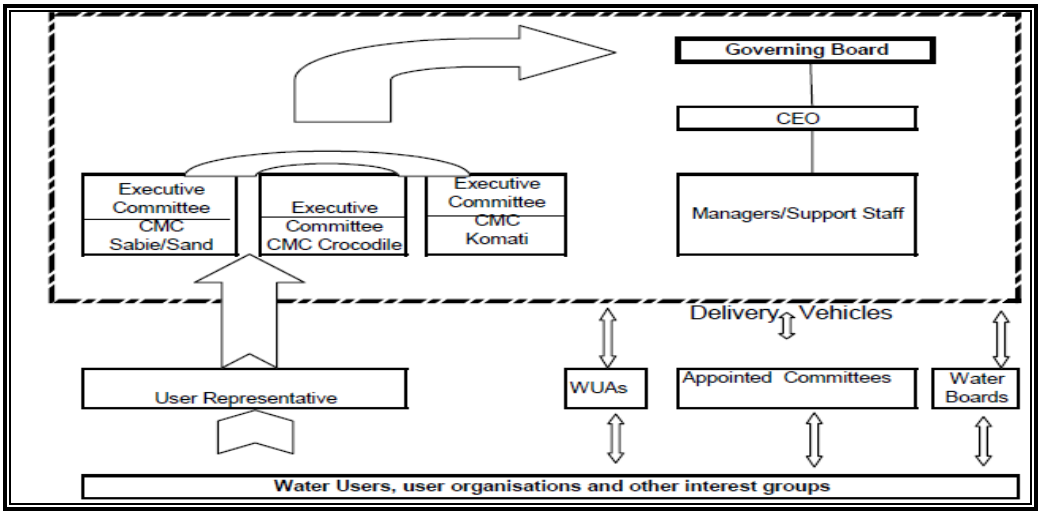

Figure 3.3: Inkomati CMA structure and support organisations

Source: DWAF (2000)

3.6 SUMMARY

The chapter started by giving an overview of the water sector in South Africa and then proceeded to provide an account of the decentralisation process of water resources management to the river basin level in South Africa which is a relatively new concept. A detailed historical account of the development of water laws in South Africa was given. It was able to show that prior to the 1998 NWA, water rights were held through riparian laws and were controlled centrally. However, the new South African government has enacted and implemented a new Water law (1998 NWA) which was motivated by the White Paper on Water Policy that was developed in 1997.

The idea of decentralising water resource management to the river basin level was to bring about equitable redistribution of water resources in South Africa. In order to secure this objective, the chapter has revealed that under the new governance system the national government is the key custodian of water resources as provided in the 1998 NWA. It also discussed the new institutional arrangements such as the Catchment Management Agencies and Water User Associations that have been introduced in the 1998 Water Act for administrative purposes. The chapter also gave a review of the Inkomati CMA establishment process that was provided through a schematic diagram showing a timeline and the functional structure of the Inkomati CMA and support organisations.

CHAPTER 4

OVERVIEW OF THE INKOMATI CATCHMENT AND ITS DIFFERENT ACTORS

4.1 INTRODUCTION

This chapter is intended to provide information on the description of the Inkomati river basin, in terms of its location and physical characteristics such as climatic patterns, topography, the main river systems and water resources availability. The chapter also gives a clear picture on the allocation of water resources among the competing sectors in the river basin. It also gives a brief description of the three sub catchments that form the Inkomati river basin and water demand use patterns in the sub catchments. Furthermore the chapter also provides an account of the river basin infrastructure such as dams. It proceeds to give the socio economic profile of the river basin and introduce the main actors in the river basin. Understanding the physical characteristics of the river basin as well as the initial conditions will help us to understand the context in which the decentralisation reform process takes place in the Inkomati river basin.

4.2 DESCRIPTION OF THE WATER MANAGEMENT AREA IN THE INKOMATI RIVER BASIN

4.2.1 Geographic Location and Topography

The Inkomati Water Management Area (WMA) is located in the north-eastern part of South Africa in Mpumalanga province. A large part of the Inkomati river basin is situated in what is frequently referred to as the “Lowveld”. However, a small part of the river basin crosses over into the Limpopo province. The Inkomati river basin is an international basin which borders with Swaziland in the south east and with Mozambique in the east. Figure 4.1 shows how the basin is shared among the three countries namely: Mozambique, South Africa and Swaziland.

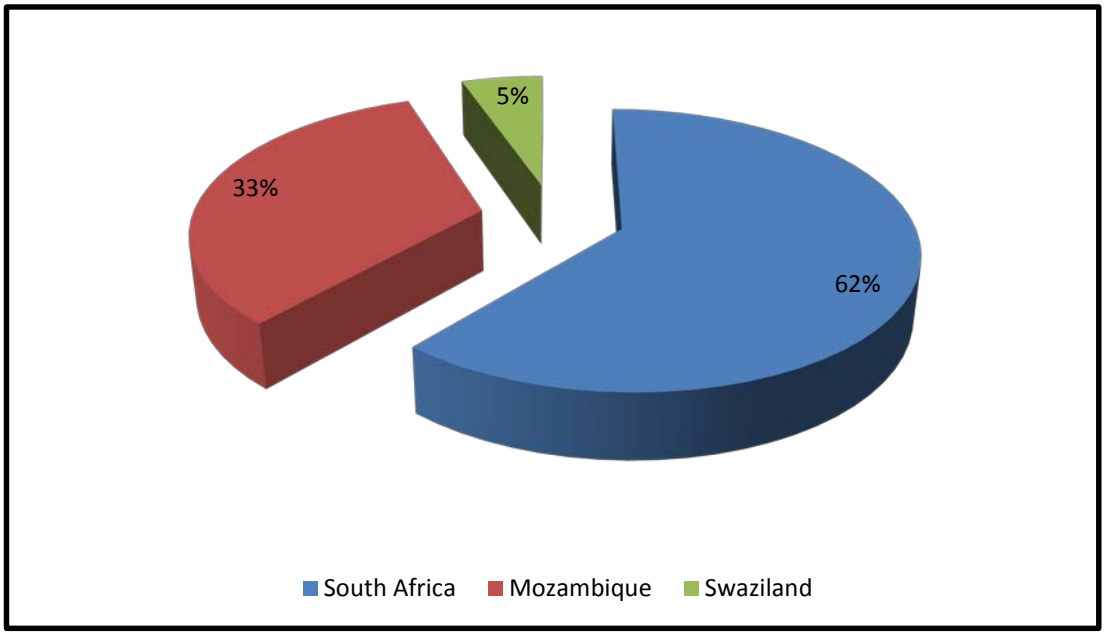

Figure 4.1: Proportion of basin shared among three member states

Source: Own compilation

This river basin has four sub-catchments namely Upper Komati (west of Swaziland), Lower Komati (North of Swaziland) Crocodile and the Sabie-Sand (Basson & Rossouw, 2003). Figure 4.2 below shows the location of Inkomati river basin.

Figure 4.1: Map showing the Inkomati river basin

Source: DWAF (2001)

The most conspicuous topographical feature in the basin is the great escarpment which divides the river basin into a plateau area in the west (which rises in excess of, 2000m above sea level) and a sub - tropical Lowveld (as low as 120m above sea level) in the eastern part of the basin (Kotze *et al*, 2006). Figure 4.3 below shows the topography of the Inkomati WMA.

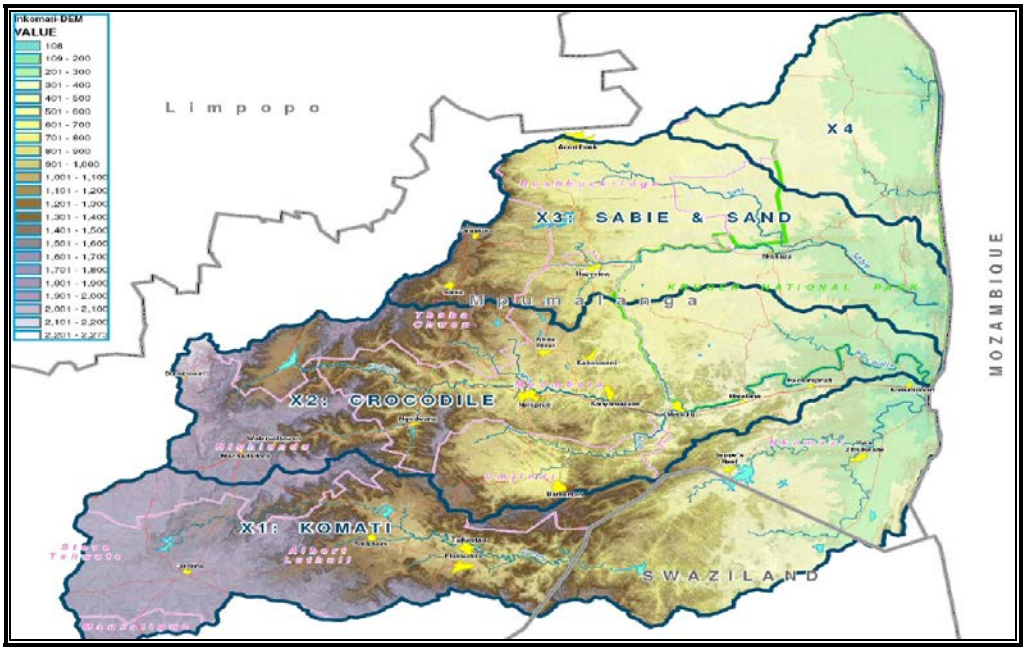

Figure 4.3: Topography of the Inkomati WMA

Source: ICMA (2010)

4.2.2 River Basin Size and Climate

The river basin covers an area of approximately 45,779 Km^2 (de Lange, 2009). Of the total river basin area 28,757 Km^2 is the portion of the basin that is claimed by South Africa with the rest being shared between Mozambique and Swaziland. The climate that prevails in the basin is thought to be generally influenced by its topography. There is a notable difference in the climatic pattern with temperate Highveld in the west and sub-tropical in the eastern Lowveld (Basson & Rossouw, 2003). On average the basin experiences cold winters with sporadic light snow on the western side of the escarpment and summer rainfall, with the western mountainous areas experiencing precipitation throughout the in form of orographic rain and mist. Statistics indicate that, the western Highveld areas can receive

between 650 and 1490mm per annum of rainfall with the Lowveld in the east receiving between 350 and 1200mm per annum (de Lange, 2009). However, the average annual rainfall can range from anything between 400 and 1000mm across most of the basin, and about 1500mm along the escarpment. Figure 4.4 below indicates the Mean Annual Runoff (MAR) in the river basin, where as Figure 4.5 shows the mean annual precipitation in the Inkomati river basin.

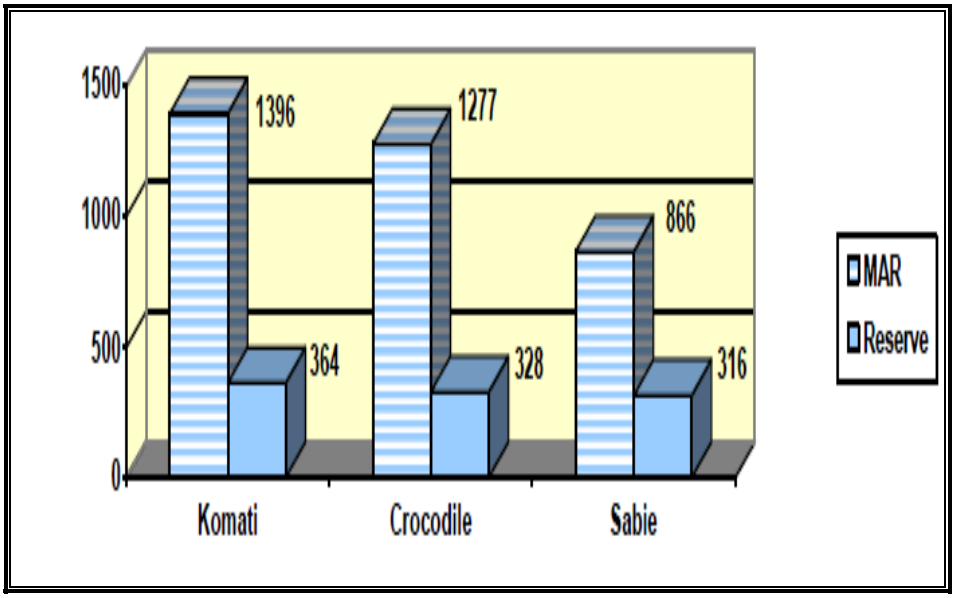

Figure 4.4: Mean Annual Runoff of sub-catchments of the Inkomati WMA

Source: Anon (2001)

There are three main rivers in the basin namely, Sabie, Crocodile and Komati. The Komati River rises from South Africa and takes a turn into Swaziland and then traverses back into South Africa before flowing into Mozambique as the Inkomati (Basson and Rossouw, 2003).

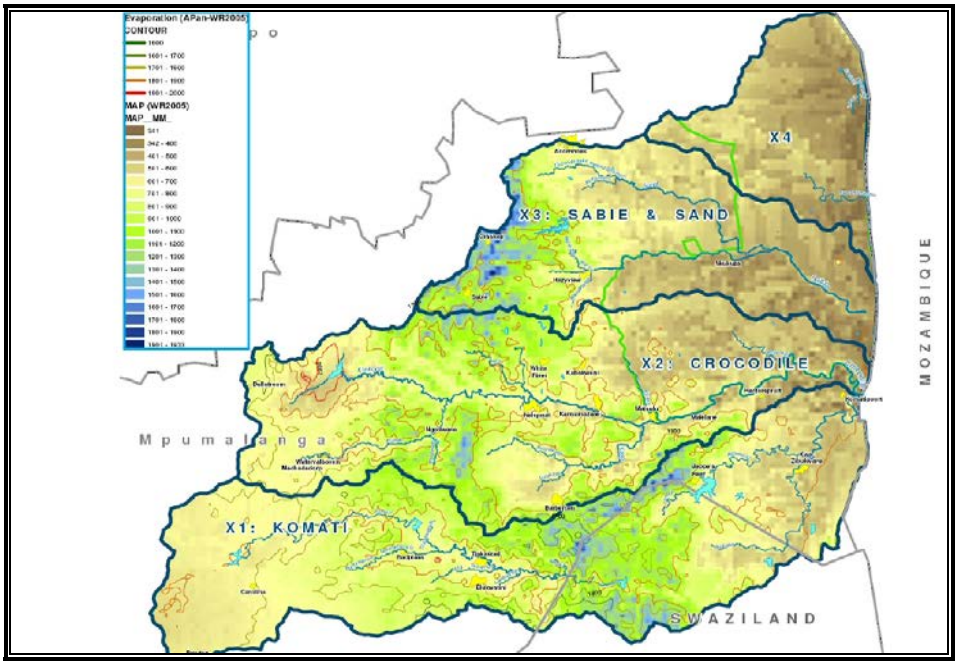

Figure 4.5: Rainfall and evaporation in the Inkomati WMA

Source: ICMA (2010)

4.2.3 Sub Basins in the Inkomati River Basin

4.2.3.1 Sabie-Sand sub Catchment

The Sabie catchments which are not part of the Kruger National Park are agricultural in nature. Large portions are under cultivation, with either dry land or irrigated agriculture. The predominant irrigated crop in the Sabie and Sand catchments is citrus. There are also significant commercial forest plantations in the high rainfall sub-catchments of the Sabie catchment, in particular the headwater catchments of the Upper Sabie, Marite and White Water catchments. Forestry in the Sand catchment is less significant. The area of Afforestation in 2004 was estimated at 853 km^2 of which 93 % is in the Sabie catchment. The forestry is mainly pine (61 %) and eucalyptus. The stream flow reduction from forestry is mainly in the Sabie catchments and is estimated to be 86 million m^3 in 2004. There are numerous farm dams and other small dams scattered over the catchment that are used mostly for irrigation, stock and game watering. Groundwater abstractions for domestic and stock watering are not significant and are likely to be under reported. Irrigation is significant and is common and widespread in the Sabie

catchment. Figure 4.6 below shows water use in the Sabie-Sand sub catchment (ICMA, 2010).

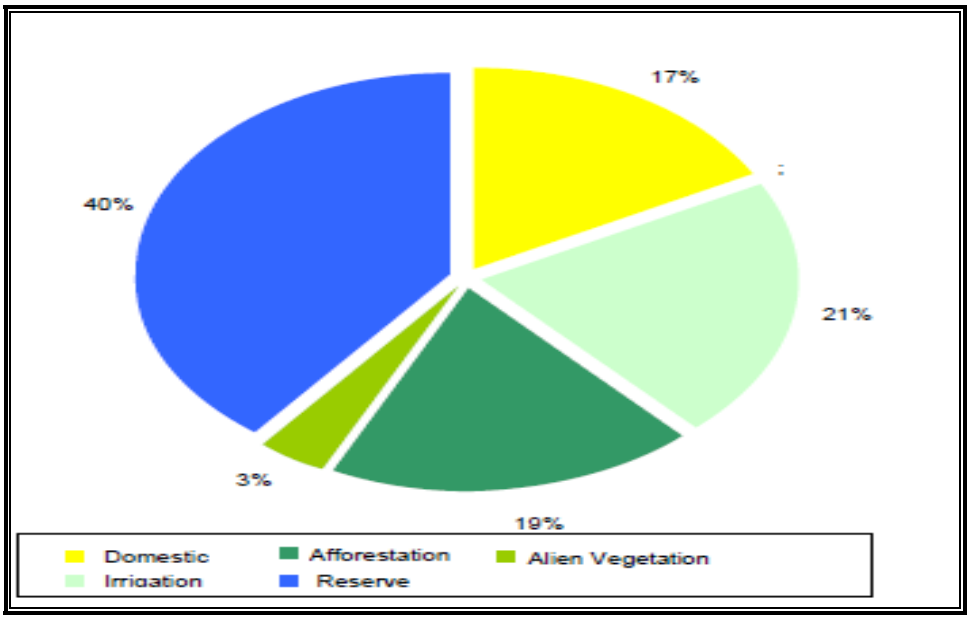

Figure 4.6: Water demand in the Sabie-Sand sub catchment

Source: ICMA (2010)

4.2.3.2 Crocodile sub Catchment

The Crocodile sub catchment falls entirely within the Mpumalanga Province and has the major urban centres of Nelspruit the provincial capital and White River in the Middle Crocodile, Kanyamazane and Matsulu in the Lower Crocodile. Smaller towns include Dullstroom, Machadorp and Watervalboven in the Upper Crocodile and Malelane and Hectorspruit in the Lower Crocodile catchment. However most of the Crocodile catchments are rural in nature with agriculture as the main activity. Commercial forestry activities are rife in the high rainfall escarpment catchments of the Upper and Middle Crocodile and Kaap catchments. The Upper Crocodile catchment is relatively undeveloped with small domestic and irrigation demands. While the Middle Crocodile catchment is more developed and has large areas of controlled irrigation and significant urban demands. The lower Crocodile has significant areas of irrigation and smaller urban/domestic demands. See Figure 4.7 below for water use in the Crocodile sub catchment. Water is transferred from the Sabie catchment to the Nsikazi North for domestic users in the Lower Crocodile (ICMA, 2010).

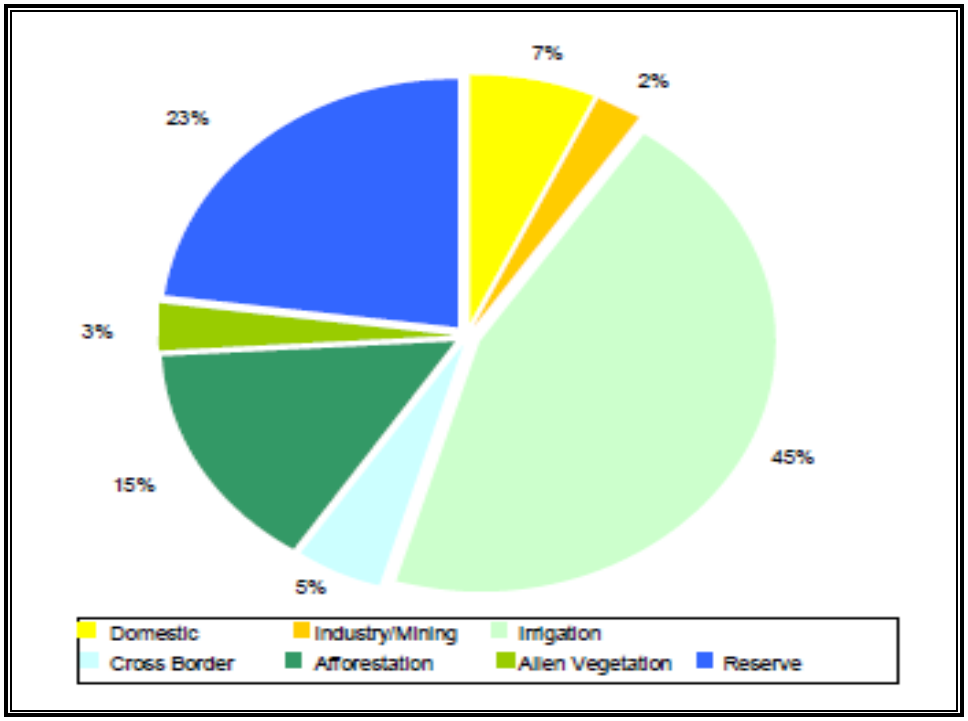

Figure 4.7: Water demand in the Crocodile sub catchment

Source: ICMA (2010)

4.2.3.3 Komati sub Catchment

The Komati catchment is mainly agricultural in nature, with significant areas under cultivation with either dry land or irrigated agriculture. The predominant crop in the Upper and Middle Komati catchments is maize, with sugar cane being the main crop in the Lower Komati and Lomati catchments. There are also significant commercial forest plantations in the high rainfall sub catchments of all the tertiary catchments of the Komati. In 2004 the area planted with forestry was estimated at 1203 km^2 and was mostly pine which constituted approximately 73 % with the remainder being eucalyptus. Mining activity in the Komati catchment is on a limited scale. Despite the small scale mining activity, there are concerns about the impact on water quality from small coal mines upstream of Nooitgedacht Dam and from abandoned mines in the Mtsoli catchment and the headwater catchments of the Lower Komati. Figure 4.8 below gives an indication of water use in the sub basin (ICMA, 2010).

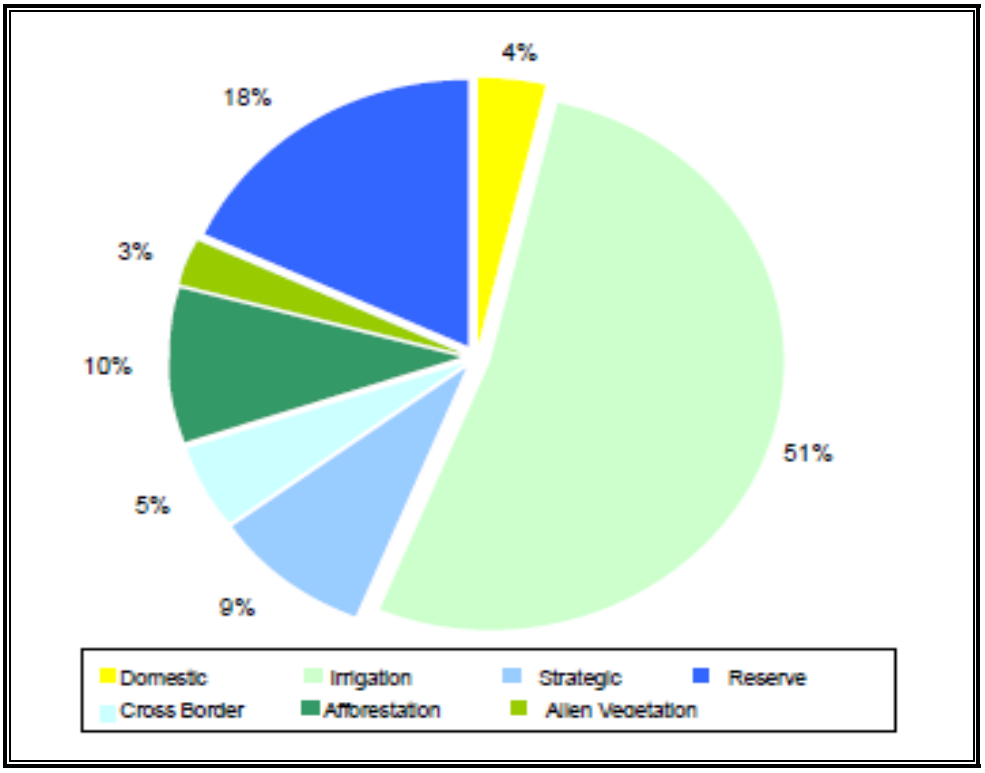

Figure 4.8: Water demand in the Komati sub catchment

Source: ICMA (2010)

4.2.4 Water Resources and Distribution

It has been observed that water requirements exceed the amount of water available in some parts of the river basin. This is particularly so in the crocodile sub - area where the situation is regarded to be critical. In the year 2000, the quantity of water in the river basin was estimated to be approximately 723 Million m^3 per annum. Owing to the seasonal variability of rainfall, there is inconsistency in stream flows which consequently impacts on the river flows. However, the availability of water in the river basin was disaggregated as follows:

- Komati (West of Swaziland) – 118 Million m^3 per annum
- Komati (North of Swaziland) – 252 Million m^3 per annum
- Crocodile – 258 Million m^3 per annum
- Sabie – 95 Million m^3 per annum

Statistics from Table 4.1 and Figure 4.9 below indicate that about 70% of the water in the river basin is required by the irrigation sector, with approximately 15 % by the forestry sector, about 7 % by urban users and with the remaining 8% being shared among the remaining users (Basson and Rossouw, 2003). It has been observed that commercial agriculture accounts for 51% of the water used in irrigation (DWAF, 2004a).

Table 4.1: Water requirement by sector in the river basin in year 2000 (Million m^3/a)

Sub area / Users	Komati-West of Swaziland	Komati-North of Swaziland	Crocodile	Sabie	Total per User
Irrigation	21	215	257	65	**558**
Urban	2	3	35	22	**62**
Rural	4	6	7	4	**21**
Mining & Industrial	0	1	23	0	**24**
Electricity	0	0	0	0	**0**
Afforestation	38	7	42	26	**113**
Total	**65**	**232**	**364**	**117**	**778**

Source: Basson and Rossouw, (2003)

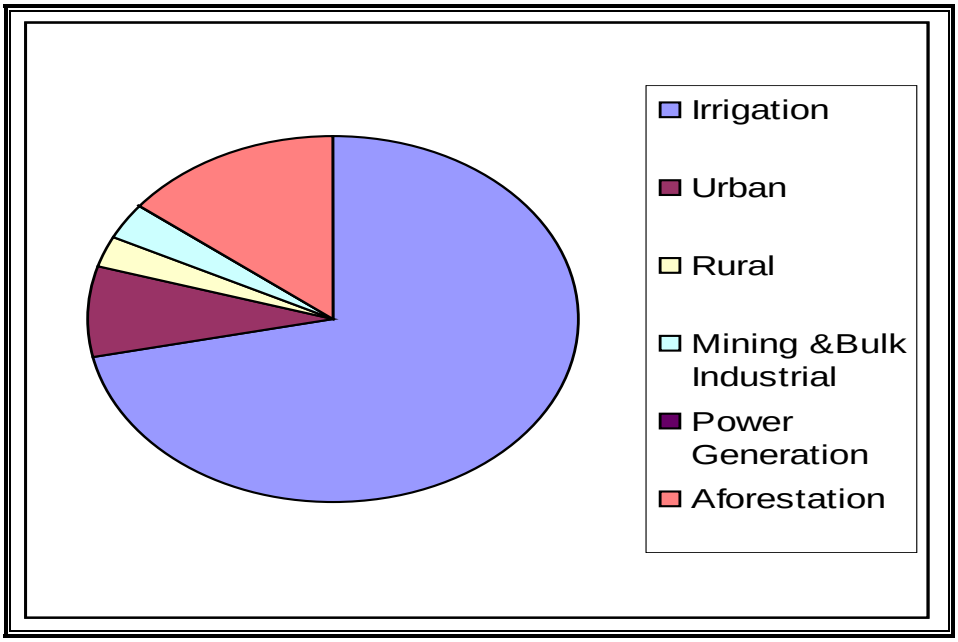

Figure 4.9: Total water demand by sector in river basin (mil m^3 /Year) in 2000

Source: Anon (2001)

There have been notable changes in water use among the different users in the basin from 2000 to 2004. The table shows that afforestation accounts for approximately 11% of water requirements in the basin compared to 15% which was approximated as at 2000. Commercial plantations cover an area of approximately 3,357 Km^2, primarily eucalyptus and pine, dominate the upper areas of the catchments. Forestry is therefore only an important water user in the Sabie catchment (29 percent) and to a lesser extent the Crocodile catchment (10 percent).

However, Table 4.2 shows relative changes in water requirements in the basin as at 2004. Industry and manufacturing are equally significant users of water in the Inkomati river basin. The single largest requirement (66 percent) in the Komati (West of Swaziland) sub basin where 97 million m^3/annum is transferred into the adjacent Olifants WMA for cooling Eskom's coal-fired power stations (see table 4.2 below). Other industrial users of water, taking into consideration the widened definition of water use, include the Sappi Kraft paper mill at Ngodwana in the Elands Valley (upper Crocodile catchment) and the two sugar mills in the Lower Crocodile (DWAF, 2003).

Table 4.2: Water requirement by sector in the river basin in year 2003 (Million m3/a)

Catchments	Komati-West of Swaziland	Komati-North of Swaziland	Crocodile	Sabie-Sand	Total Inkomati WMA	%
Irrigation	21	222	257	65	565	57
Urban	2	3	35	22	62	6.3
Rural	4	6	7	4	21	2.1
Mining		1	23	0	24	2.4
Afforestation	23	12	42	37	114	11
Sub-Total	**50**	**244**	**364**	**128**	**542**	
International Requirement		60	49	0	109	11
Transfers	97		0	0	97	9.8
Grand Total	**147**	**304**	**413**	**128**	**992**	

Source: Brown and Woodhouse (2004)

Figure 4.10 below shows the share percentage use of water in the Inkomati river basin in a recent survey. In contrast it shows an increase in water use by afforestation which now accounts for 17% of water use in the Inkomati river basin, it also shows an increase in domestic water use which now approximately 10% compared to the 8.4% (Urban and Rural) in a 2004 study.

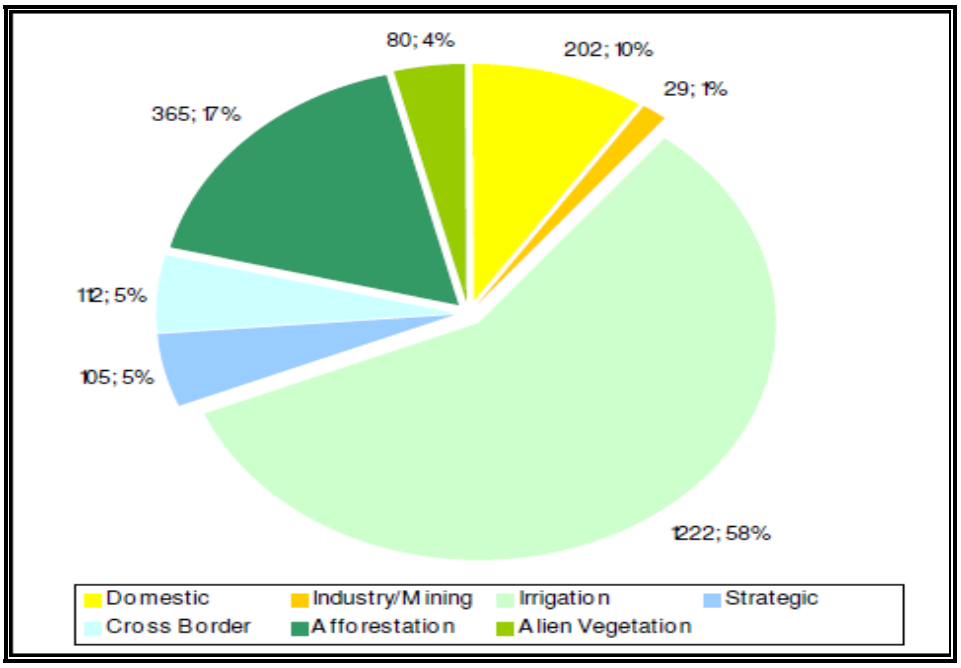

Figure 4.10: Inkomati WMA water demands

Source: ICMA (2010)

The water balance which is just the reconciliation of water requirements and water availability for the various catchments in the Inkomati indicates that there is a negative balance in all but the Sabie-Sand, which is projected to have a surplus of 31 million m^3/annum (DWAF, 2004a). However, Figure 4.11 below indicates that there is also a negative balance in the Sabie-Sand sub catchment. There is a shortfall of 41 million m^3/annum in Komati West of Swaziland, 6 million m^3/annum in the Komati North of Swaziland and 149 million m^3/annum in the Crocodile sub catchment (DWAF, 2004a). During the drought period of the early 2000s, with the exception of the Sabie, the rest of the WMA experienced severe water shortages, despite the construction of two major dams (Driekoppies and Maguga) in the last ten years (Brown & Woodhouse, 2004). The dams were built to improve water supply to areas that were previously disadvantaged.

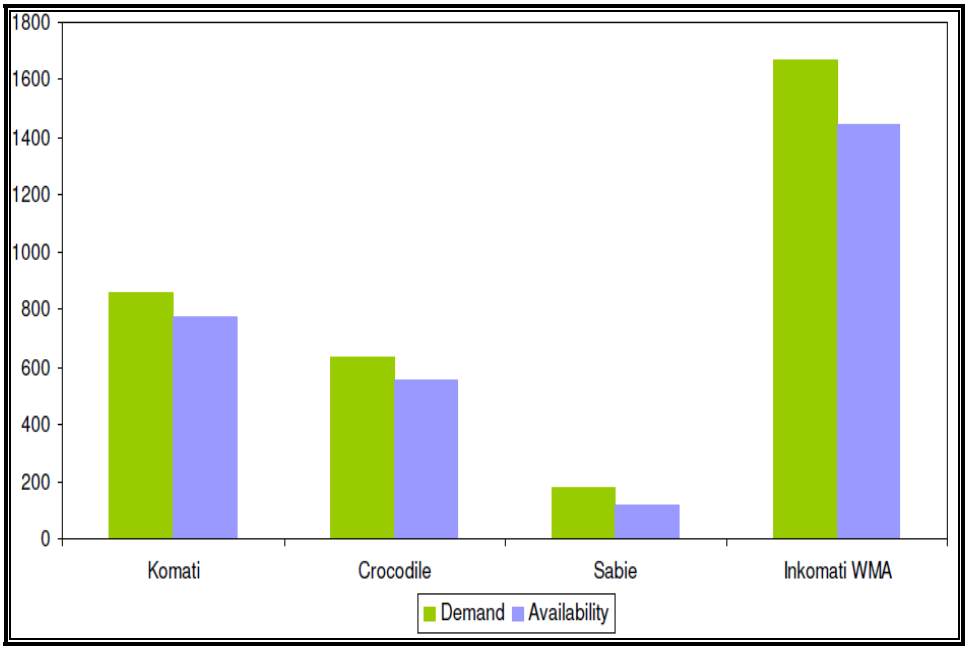

Figure 4.11: Current allocated water use Vs availability

Source: ICMA (2010)

4.2.5 Other River Basin Resources

Vegetation is predominantly that of mesic highveld grasslands in the western high-lying areas of the river basin (Mucina & Rutherford, 2006). Scanty Thornveld characterizes the eastern part of the basin with forest cover along the escarpment. In the south western part of the basin, are found rich Coal fields where widespread mining takes place. While in the north-eastern part of the basin, is located the Kruger National Park which is one of the most important ecological habitats of the country. There are also several private game reserves that are close to the Kruger Park and conservation areas. There are also gold and other mineral deposits in the region of Barberton which extend in the northern direction (Basson & Rossouw, 2003).

4.2.6 Inkomati River Basin Infrastructure

Water resource infrastructure (dams and canals) is well developed in the majority of the Inkomati river basin and is reserved for the white population. However, with the end of the apartheid regime several new dam construction projects were initiated, which saw major dams being constructed in the 1990s (Woodhouse, 2008). The recently completed Inyaka Dam on the Marite River, a tributary of the Sabie River, was constructed mainly to supply the domestic and ecological water requirements along the lower Sabie River and the domestic water requirements in the Sand River sub-catchment by means of the Bosbokrand Transfer Pipeline (BTP). The pipeline will transfer up to 25 million m^3 of water per annum to the Sand sub-catchment for this purpose. The full supply capacity of the Inyaka Dam is 123 million m^3, and the additional yield that becomes available as a result of the construction of this dam is estimated at 58 million m^3. In addition to the Inyaka dam, the other significant dams in the Inkomati WMA include:

- The Vygeboom and Nooitgedacht dams in the Upper Komati River, from which water is transferred to the Olifants WMA, mainly for use in the cooling of power stations.

- The Maguga Dam (in Swaziland) figure 4.12 below and Driekoppies Dam, have both been completed recently to increase the assurance of supply to irrigators in the Komati and Lomati River sub-catchments to acceptable levels.

- The Kwena Dam in the upper Crocodile River, augments water supplies to users along the Crocodile River.

Figure 4.12: Maguga dam with hydropower plant on the right
Source: ICMA (2010)

In addition to the major dams highlighted above there are also a number of important canal systems that distribute water to irrigators in the Crocodile, Sabie and Sand River catchments. Numerous farm dams have also been constructed throughout the sub- catchments (Kotze *et al.,* 2006).

4.3 SOCIO-ECONOMIC PROFILE OF THE RIVER BASIN

4.3.1 Demographics

The basin has a population of approximately 2.2 million people who directly or indirectly benefit from the river basin natural resources. Consisting of an urban and semi-urban population of 940 000 people and the remainder classified as rural - 67% (DWAF, 2004a; ICMA, 2010). The population is expected to increase to 3.5 million by 2020 (Crafford *et al.,* 2004). Figure 4.13 below shows the population distribution in the WMA. Important urban centres include Nelspruit, White River, Komatipoort, Carolina, Adplaas, Barberton, Sabie, Bushbuckridge and Matsulu. A large number of rural settlements include Mhala, Mapulaneng, Nsikazi, Nkomazi and Mswati regions (Kotze *et al*., 2006). There are marked differences in skill

levels between races and poverty levels in the province are estimated at 57% (Crafford *et al*., 2004).

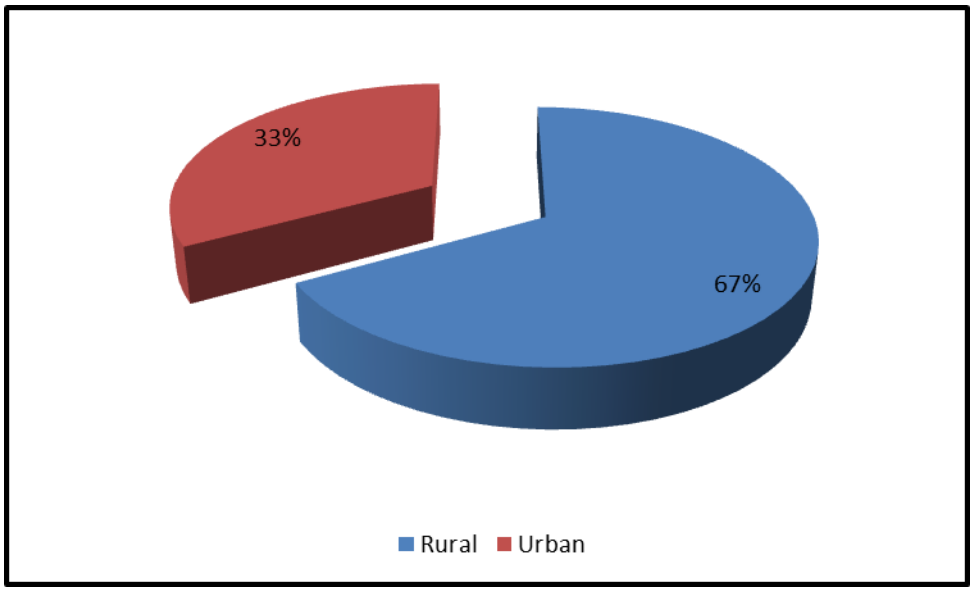

Figure 4.13: Population distribution in Inkomati WMA

Source: Own compilation

4.3.2 Economic Production of the River Basin

The Inkomati river basin is one of the poorest and more rural WMA of the country (Crafford *et al*., 2004; DWAF, 2004a). The basin contributes approximately 1.3% to the national Gross Domestic Product (GDP). The main economic sectors include manufacturing, mining, electricity generation, agriculture, forestry with the tourism sector growing gradually (MII, 2009). Manufacturing is the single largest economic sector with a contribution of 24.6% to the basin GDP, followed by agriculture, which is approximated at 18.6%, government at 16.4%, and lastly trade was approximated at 13.6% (Basson & Rossouw, 2003; Kotze *et al.*, 2006; MII, 2009). Recent statistics indicate that mining is still the dominant contributor to the Inkomati river basin GDP, followed by industry, irrigation, and forestry. Contribution of GDP from the combined sectors of irrigation and forestry accounts for more than 50% to the total GDP of the river basin. Irrigation is the dominant contributor to the water generated employment of the basin, followed by industry, mining, and forestry in that order (ICMA, 2010).

Irrigated agriculture is considered as the economic backbone of the river basin and as such is allocated about 60% of the water resources in the basin. It produces approximately 15% of South Africa's total output Estimates of land developed for irrigation in several locations of the basin are around 10,000 ha. Frost sensitive crops and tropical fruits are grown in the warm sub-tropical escarpments of the basin. While the eastern parts of the basin (lower crocodile and Komati river valleys) are used for growing sugarcane. For the most part, dry – farming land is utilised in agricultural production but there are extensive irrigated in the WMA (MII, 2009). There are also two sugar mills, which are located in Malelane and Komati regions (Kotze *et al.*, 2006). Overall, there is enormous potential for increased agro-processing in the Inkomati WMA; however, this increased agricultural production maybe constrained by limited water resources in the some areas of the WMA (MII, 2009).

The Inkomati WMA is South Africa's major forestry production area. It is climatically suited for growing trees on a commercial basis. The forestry industry has grown substantially and is now one of the important sectors in the Inkomati WMA which is contributing approximately 4.7% of the GDP. The wood, pulp and paper industry receive their raw materials from the high western mountainous forests. Out of the 148 primary processing plants 39 are located in the Inkomati WMA. These include the largest integrated paper mill in Africa (Sappi Ngodwana), the largest softwood sawmill in Africa (Mondi Sabie) and the largest panel and board plant in South Africa (MII, 2009).

The tourism sector in the Inkomati WMA contributes the local economy and plays a significant role in the national economy. The WMA is contributing significantly to the fastest growing segment of tourism (ecotourism) in South Africa. The WMA also offers hunting Safaris, farm holidays and lodges and a rich cultural heritage. In excess of 700,000 visitors are reported annually at the Kruger National Park, one of the Inkomati WMA's single largest attraction (MII, 2009).

4.4 PRINCIPAL ACTORS IN THE INKOMATI RIVER BASIN

There are various actors in the Inkomati Water Management Area (WMA) who can mostly be identified by their water use activities or by their desire to conserve water resources. They fall in categories which include those from the agricultural, mining, industry, fisheries, forestry, and tourism sectors as well as rural and urban water users. Rural and urban users mainly require water for drinking and other domestic chores (DWAFa, 2004). Other stakeholders include those from the conservation and environment sectors. Below is a brief description of some of the identified actors and agencies with an interest in water use and management in the Inkomati river basin.

4.4.1 *Department of water affairs (DWA) – head office*

The Department of Water Affairs (DWA), based in Pretoria, is responsible for implementing the National Water Act, including approval of all CMA proposals (Woodhouse, 2004). The department performs key roles in four areas which include:

- Water Policy: The DWA is in charge of developing national water management policy guidelines, which take into account imperatives at national and international level.

- Regulation: The DWA oversees the water service providers and can intervene in the event that the service level provided does not comply with the set standards.

- Technical support to the local authorities: As defined in the Constitution, the DWA function is also to support local authorities, in co-operation with other state departments.

- Information management: The DWA collects and publishes information on the water services sector in order to promote benchmarking and yardstick competition between municipalities.

4.4.2 Department of Water Affairs - Regional Office

According to (Woodhouse & Hassan, 1999), following the reorganisation of provincial and local government, Department of Water Affairs (DWA) regional boundaries were re-drawn to coincide with those of provinces. In Inkomati Water Management Area (WMA), the Regional Office (RO) was established in Nelspruit, the administrative capital of Mpumalanga Province. The DWA regional level consists of four sub- Directorates, namely:

- Water Quality (pollution control)
- Water Resources (Dams, infrastructure, water allocation to Irrigation Boards and Water Boards)
- Planning and development
- Operations and maintenance

4.4.3 Mpumalanga Department of Agriculture

The Mpumalanga department of Agriculture was established to give support to all farmers in Mpumalanga but it devotes most of its attention to homeland administrations of Kangwane and Kwandebele. The department plays two important roles in regulating water access in the river basin. The first role being that of the allocation of water to black farmers and the second one is that of supporting investment, operations and maintenance of irrigation schemes (Woodhouse & Hassan, 1999).

4.4.4 Irrigation Boards

Irrigation boards were established under the 1956 Water Act and are responsible for water distribution along many of the stretches of rivers under Government Water controlled Areas (GWCAs). Under the 1956 Water Act It was mandatory for

irrigators to be members of Irrigation Boards (IBs), which have effectively become the day-to-day managers of the water resources at the local level, (scheduling irrigation, operating water works, and prosecuting members who are found to be stealing water). IBs constitute the main body of expertise and information about water use in their locality, and water resource management is therefore highly decentralised at that level (Woodhouse, 2004; Brown & Woodhouse, 2010).

4.4.5 Commercial Farmers

It has been noted that with the exception of small schemes run by homeland administrations, irrigated agriculture in the Inkomati WMA has historically been the preserve of white commercial farmers and through membership to Irrigation Boards, are able to easily secure access to water. Notably most of the government's investment in storage dams in the Inkomati WMA has been designed to serve the needs of commercial farmers (Woodhouse, 1995, ICMA, 2010).

4.4.6 Industrial Interests

Two industries have been singled out as major water users in the Inkomati river basin. Sappi Kraft paper mill and the Transvaal Sugar Limited (TSB) mills use relatively large amounts of water compared to the other industries in the Inkomati WMA and as such are important stakeholders in the CMA process. (TSB) owns the two mills in the Nkomazi locality that together process all the sugar produced in the area. As the sole purchaser of sugar cane, TSB Sugar is an important stakeholder within the Nkomazi area, possessing considerable power over its growers and the Irrigation Boards. TSB Sugar Company provides technical support to emerging sugar cane growers in the Nkomazi area (Woodhouse, 2004).

4.4.7 Environmental Interests

The sector is well represented by local government departments, the Kruger National Park (KNP), Environmental Non Governmental Organisations (NGOs),

and local conservancies established by farmers seeking diversification into wildlife based enterprises. The Mpumalanga Parks Board is in charge of assessing and protecting the biodiversity of the whole province, but it does not have any regulatory function (Woodhouse, 2004).

4.4.8 Municipalities

Municipalities are part of the Local Government system and are the lowest tier of local government since 2003 (Woodhouse, 2004). Municipalities are responsible for the provision of water services and are guided by the Water Services Act of 1997. It is not the responsibility of municipalities to manage water resources but rather they are responsible for the delivery of purified water for domestic use in both urban and rural areas and in some cases to industries which are located in the urban areas as well as sanitation service.

4.4.9 Tribal Authorities

Traditional institutions represent the oldest form of government and currently there are sixty seven traditional authorities in the Inkomati WMA. However, the 1998 NWA does not explicitly recognise traditional water management structures and in fact, traditional water management structures are not mentioned at all in the 1998 Water Act. Traditional authorities have a role to play in both water resource management and water service delivery but their involvement is not very clear (Malzbender *et al*., 2005).

4.4.10 Komati basin water Authority

The Department of Water Affairs (DWA) was instrumental in the establishment of the Komati Basin Water Authority (KOBWA) to oversee the development of the Komati River basin. A treaty was signed between South Africa and Swaziland to create KOBWA, whose first meeting was held in November 1992. The body consists of six members, three from each country (South Africa and Swaziland), two of whom are DWA officials (Turton *et al*., 2004)

The organorgram in Figure 4.11 below shows the relationship between the various actors in the water sector in the Inkomati river basin. The arrows show the flux and flow of information between the actors. Under the current institutional arrangements the DWA RO is still responsible for water resource management and has still retained a considerable amount of power. Stakeholders in the river basin still have to get authority from the DWA RO for them to either set up waterworks or divert a water course. The RO is also still responsible for the collection of revenues derived from the use of water in the river basin. The decentralisation of authority in water resource management in the Inkomati WMA has only been devolved partly to the lower levels such as the Inkomati CMA and WUAs. The current relationship and flow of information between organisations in the Inkomati river basin is also shown in Figure 4.11 and is likely to change in view of the additional functions that have been delegated to the Inkomati CMA as discussed in Chapter 6.

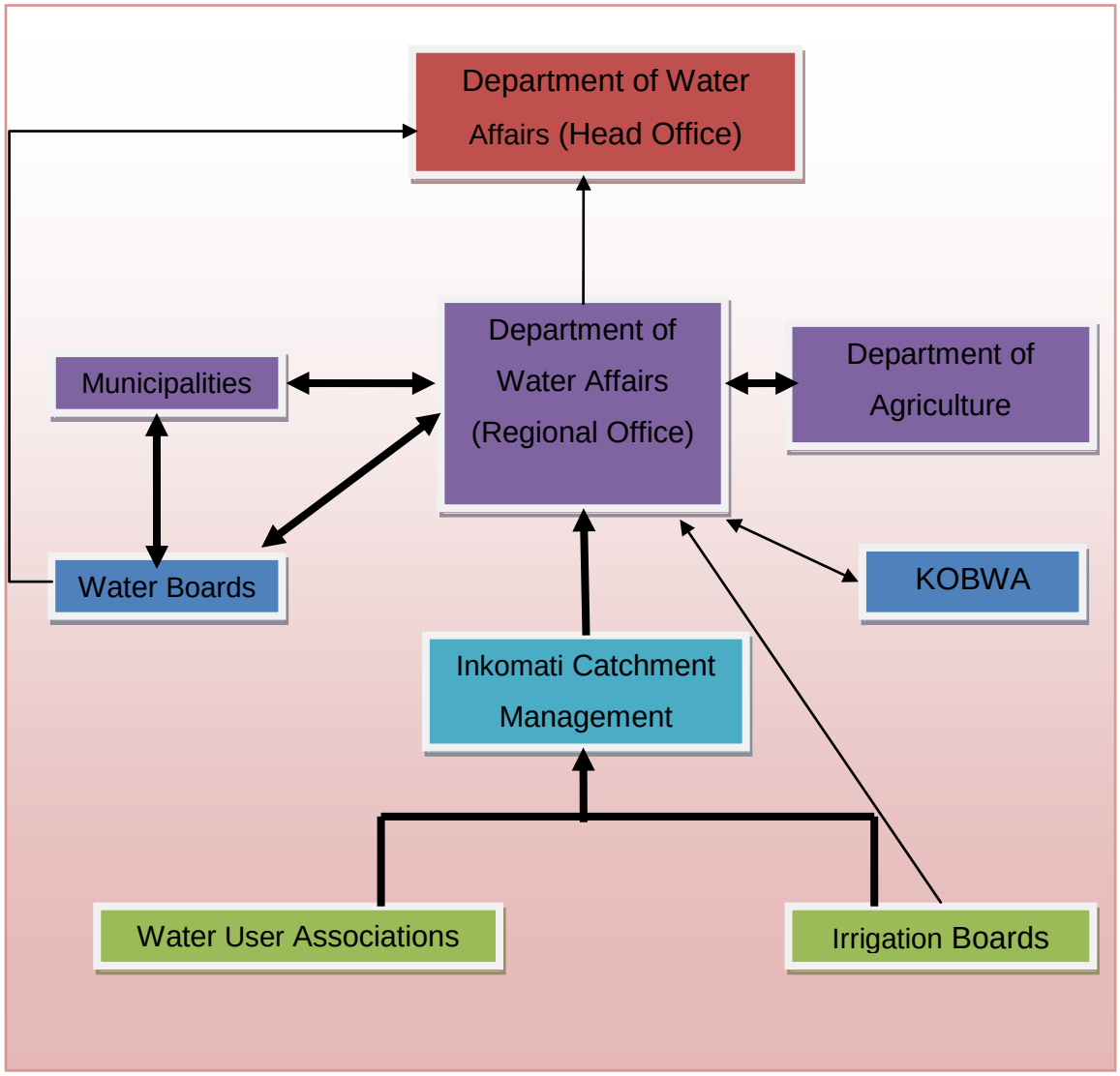

Figure 4.11: Water Administration in the Inkomati WMA

Source: Own compilation

4.5 SUMMARY

This chapter provided a detailed description of the Inkomati river basin and it role players. It gave the physical location of the river basin and the provinces which the river basin is located as well as the resources in the river basin. The contextual factors of the river basin appear to favour decentralisation reforms. The Inkomati river basin has a population of approximately 2,208,771 of which 67% resides in the rural areas and represents the most vulnerable group in the river basin. A large part of the river basin is located in the Lowveld and the most conspicuous topographical feature in the basin is the great escarpments which divides the basin

into a plateau area. The chapter showed that the river basin is part of an international river basin that is shared among three countries. These are Swaziland, Mozambique and South Africa covering a total area of approximately 45,779 Km^2 thus making water a politically contested resource in the river basin. However, the portion of the river basin occupied by South Africa covers an area of approximately 28,757 Km^2.

The Inkomati river basin has three sub basins namely the Sabie-Sand, Crocodile and the Komati which makes it rather easy to manage the separate hydrological units. The three sub basins have varying degrees of water use by the various competing water users such as industry, forest plantations, commercial agriculture, environmental groups and domestic users. The major water user in Inkomati river basin is Irrigated agriculture which uses approximately 58% of the basin's water resources with commercial farmers accounting for most of this water. The river basin has well developed infrastructure in form of dams, canals and other water works. It is approximated that about 1.3% of the South Africa's GDP is generated in the Inkomati river basin, which is not much compared to other river basins. Interestingly enough the largest contributor of GDP in the river basin is from the mining sector followed by industry. Some of the key actors in the Inkomati river basin were identified and discussed and included the DWAF, Irrigation Boards, commercial farmers forestry and environmental groups among others. The different groups identified provide an opportunity to implement IWRM principles in the river basin.

CHAPTER 5

THE DYNAMICS DURING THE ESTABLISHMENT PROCESS OF THE INKOMATI CMA

5.1 INTRODUCTION

This chapter presents the findings of the survey and discusses the results. The information provided in this chapter documents the opinions of those involved in water resource management and affected by IWRM processes in the Inkomati WMA. It starts by first analysing the process through which the Inkomati CMA was established. It identifies the initiators and key players in the decentralisation process and the motivation behind the implementation of the decentralisation process. It proceeds to explore the stakeholder involvement process in the Inkomati river basin during the establishment of the Inkomati CMA. It also looks at the characteristics of the decentralisation process itself and the inertia that was experienced in the Inkomati CMA establishment process. It then proceeds to discuss water politics associated with the Inkomati CMA establishment. The results provided in this chapter give insight into these issues and represent a crucial step towards water management transformation in South Africa.

5.2 INITIATORS, DRIVERS AND MOTIVATION FOR THE PIONEERING ESTABLISHMENT OF INKOMATI CMA

The study was guided by the following main research question - why the Inkomati WMA had successfully managed to establish its CMA in comparison to the other four pilot regions that were equally given priority status at the start of the reforms. The research findings are based on interviews that were conducted with key source persons and have shown that there were several factors that contributed to this observed phenomenon. Indeed, there is no single factor that can account by itself for this observable fact. The study also tried to enquire on how the decision

was made of making the Inkomati WMA the lead WMA in implementing the new water reforms but the results of the enquiry were inconclusive with regard to this aspect.

The Department of Water Affairs (DWA) through its Regional Office (RO) in Mpumalanga (interview 7, personal communication, February 2011) started the decentralisation process of water resources management to the river basin level in Inkomati WMA. The stakeholder engagement process begun in 1997 and was championed by a reform-oriented Water Quality Deputy Director who did it out of personal interest (Brown, 2010). During interview 7 the DWA official at the RO was also quick to point out that the initiation process was something that was started by DWA RO in Mpumalanga and staff were excited about the whole process and wanted to be identified with the first CMA to have been established in South Africa. However, the DWA RO was later joined by commercial farmers who equally played an instrumental role only after they overcame their initial reluctance to decentralise water resource management to the river basin level (interview 3 & 8, personal communication, February 2011). This initiative begun in 1997 before the NWA No. 36 of 1998 became legislation. This observation has also been reported by Brown and Woodhouse (2004) during their field work. Thus it was the pro-active approach of these two groups in the initial stages of course with DWA RO (interview 7) being the initiator of the decentralisation process that gave impetus to the entire decentralisation reform process of water resources management to the river basin level in the Inkomati WMA.

Irrigators as part of the pioneers of water resources decentralisation process in the Inkomati WMA were at the time and even more recently, are still being considered as the major water users in the river basin (interview 11, personal communication, February 2011). See also for instance chapter 4 of the study which details water use patterns in the river basin. In the initial stages of the reform process commercial farmers were not pleased with the discourse on the expected changes in water legislation. The situation was further complicated by the fact that discussions on establishing a CMA for each sub-catchment (Crocodile, Komati and Sabie) started prior to the finalisation of legislation and associated regulations and policies (DWAF, 2001). However, with passage of time it became clear to the

commercial farmers that the new national government was determined to transform legislation that guided water resource use. Consequently, the National Water Policy (NWP) of South Africa was developed in 1997 and became the guiding document for water resource governance in South Africa.

The anticipated change in water legislation entailed the introduction of a new water law (NWA No. 36 of 1998) that currently ring-fences water resource management in South Africa, thus, withdrawing Water Act No. 54 of 1956 that gave commercial farmers the preserve to use water resources on their land or water resources that flowed over their land – riparian rights. Hence, their initial reluctance to participate in the decentralisation reform process, but very rapidly also their involvement due to the fear that they would lose out if they did not participate in this transformation process (interview 8, personal communication, February 2011). Willingly commercial farmers became less reluctant and chose to participate in this reform process. It was now seen by commercial farmers as an opportunity to have a say over how water resources were going to be managed in the catchment in future and also ensure that they maintained their water use activities and allocation levels (Brown & Woodhouse, 2004; interview 3). The initial idea of the commercial farmers in this decentralisation process was to decentralise and manage water resources separately in the three sub basins of the Inkomati WMA, namely, Sabie-Sand, Crocodile and Komati. This was before the three sub catchments were amalgamated into the Inkomati WMA as stipulated in Chapter 2 of the NWA under section 20. For a brief account on the amalgamation of the three sub-catchments refer to section 5.3.

Firstly, it was their will (commercial farmers) to advocate for separate sub-catchment management agencies because commercial farmers believed that if areas were smaller it would make it easier to mobilize people (river basin stakeholders) and guarantee their participation in the water resource decentralisation process, especially formerly disadvantaged groups. Secondly, it was the “conviction” of commercial framers that management of water resources (interview 11, personal communication, February 2011) could be better achieved if the Inkomati catchment was divided into the three separate smaller hydrological units for ease of management. Thus when stakeholder involvement discussions

were initiated, they were organized separately in the three sub-basins and not as one whole river basin. It was hoped that each of these sub basins would have its own separate Catchment Management Agency (CMA) when the idea was born. However, when the Water Act (NWA No.36) was passed in 1998 it stated that each WMA should have one CMA to manage the water affairs of the WMA - the Inkomati (Brown, 2010). A laborious stakeholder participation process was therefore, embarked on. Refer to section 5.2.1 for a brief overview of the process.

Though the process of stakeholder mobilization was started by DWA, commercial farmers were able to mobilise other basin stakeholders because of their leverage. Inkomati WMA had 27 irrigation boards but now has 26 well organised irrigation boards compared for instance two other pilot WMAs Mvoti to Mzimkulu and Olifants which have 16 and 17 irrigation boards respectively. Table 5.1 shows the number of IBs in the pilot WMAs and the status of the CMA establishment.

Table5.1: Number of irrigation boards and CMAs established in pilot regions

Water Management Area	Number of Irrigation Boards	CMA Established
Crocodile West and Marico	12	No[10]
Olifants	17	No
Inkomati	26	Yes
Mvoti to Umzimkulu	16	No[11]
Breede	58	Yes

Source: Bourblanc (2011); Rogers & Luton (2011); Benadé *et al*. (2010)

Most of the irrigation boards in Inkomati WMA are well established with a good membership and sufficient financial resources to perform water resource management activities and are strong stakeholders in the WMA. Similarly, Breede Overberg WMA has a large number of irrigation boards (58) that are well organised and managed to fully establish its CMA (BOCMA) recently. However, the picture is different in the Mvoti to Mzimkulu WMA with most Irrigation boards not being as strong as those in the Inkomati river basin. The IBs in Mvoti to

[10]The CMA has been gazetted administratively but is not yet functional pending the completion of the institutional realignment process.
[11] The CMA has also been gazetted administratively but is not yet functional pending the completion of the institutional realignment process.

Mzimkulu WMA are far less numerous, which does not enable them to perform most water resource management activities performed by well-established IBs, for example it is challenging for them to even operate irrigation schemes and policing of members to ensure that they adhere to the pumping hours and so forth. In a similar study (Bourblanc, 2011) also points out that the Inkomati, Gouritz and Breede Overberg WMAs, appear to have a relatively higher number of IBs (27,58 and 27 respectively). These observations attempt to test the first hypothesis of the study, which hypothesised that, the more IBs in a river basin, the bigger the chance for a CMA to get support from commercial agricultural organised interests in its establishment process and its latter functioning.

The five pilot regions have different type of characteristics and in some cases have similar characteristics that can help explain the variation that has been observed in the establishment of the CMAs in their respective WMAs. Table 5.2 displays some of the characteristics of the five pilot regions. Coincidentally the WMAs with an agricultural base and medium size characteristic have had a higher chance of establishing their CMAs which are functional as shown in Table 5.2. This characteristic has some relation with the type of IBs that are likely to be found in a WMA.

Table 5.2: Characteristics of the five pilot WMAs

Water Management Area	WMA #	Type of WMA	Characteristic of WMA
Crocodile West and Marico	3	Large	Urban dominated
Olifants	4	Medium	Rural, agricultural, industrial, mining
Inkomati	5	Medium	Rural, agricultural, industrial, mining
Mvoti to Umzimkulu	11	Large	Urban dominated
Breede	18	Medium	Agricultural

Source: Mazibuko & Pegram (2006)

The above characteristics can be attested with in Table 5.3 where the amount of water use in agriculture is high in the two WMA that have established their CMAs - Inkomati and Breede Overberg. This shows that agriculture is dominant in the two WMAs.

Table 5.3: Total volumes in millions of water use by different sectors in pilot WMAs – 2008

Water Management Area	Agriculture: Irrigation/Live stock Watering	Domestic/ Industrial	Forestry	Unbillable	Total
Crocodile West and Marico	**685,930,301**	**282,682,064**	**13,529.00**	**46,810,676**	**1,015,436,570**
Olifants	681,847,406	326,800,459	27,038,687	32,060,867	**1,067,747,419**
Inkomati	1,053,384,149	286,390,486	249,325,201	5,212,190	**1,594,312,029**
Mvoti to Umzimkulu	235,417,088	493,947,030	209,993,623	1,139,960	**940,497,702**
Breede	872,695,587	50,117,558	4,997,020	3,237,306	**931,047,472**

Source: DWAF (2008b)

Another cardinal element that is interesting to note about the five pilot regions is that, the pilot regions that have lower GDPs (Inkomati and Breede Overberg) have had a higher chance to establish their CMAs compared to the other three pilot regions (Mvoti to Mzimkulu, Crocodile West and Marico, Olifants) which have relatively higher GDPs. This is illustrated in Figure 5.1 below. This observation partially addresses objective 3 of the study which attempts to describe the drivers that could potentially help explain the decentralisation process in the Inkomati river basin. Interestingly the Breede, which has also recently established its CMA, has a relatively lower GDP. Further GDP has been cited (Dinar *et al*., 2005) as a key contextual variable in the decentralisation process. Hence initial conditions that exist in a river basin at the start of the decentralisation process can be said to influence the process.

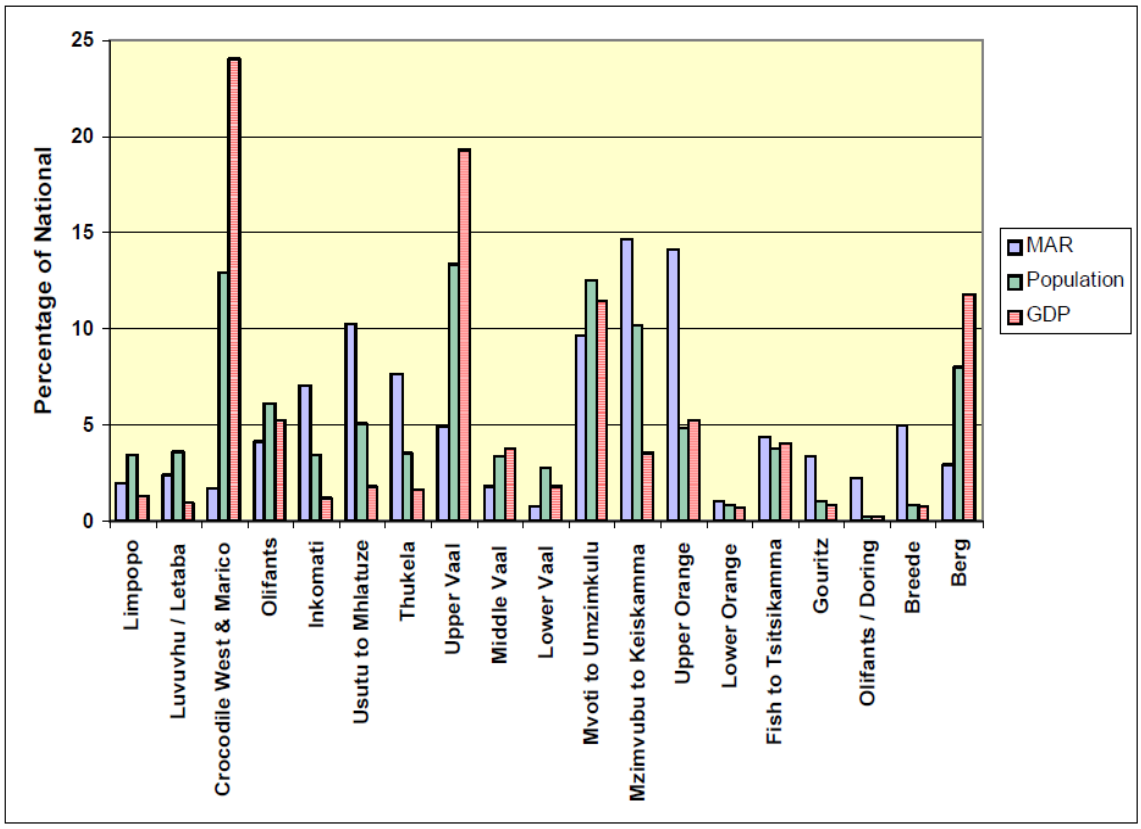

Figure 5.1: Comparison of GDP and WMA

Source: Adapted from WRC (2003)

However, another significant factor that should not be overlooked when explaining the relative success of the Inkomati CMA establishment process is the issue of transboundary basins. The Inkomati WMA and two other pilot WMAs (Olifants, and Crocodile and Marico) are part of international river basins. International river basins usually have several stakeholders with vested interests and capacities. At the moment there is no accepted international agreement specifying trans-boundary flow requirements for the Olifants River (Raven, 2004). However, the case is different in the Inkomati international river catchment where several agreements are in place, such as the Inco-Maputo agreement. Sufficient international human capacity was made available in setting up the Inkomati CMA through organisations such as KOBWA (interview, 1 and 3). The human capacity at the DWA RO was thus enhanced during the Inkomati CMA establishment. Hence this was another distinguishing feature in the establishment process of the Inkomati CMA. Karar *et al*. (2011) note that the issue of transboundary role is an important one that needs to addressed adequately. The other two pilot regions are

local river basins that do not share boundaries with any country. This implies that the respective CMA establishment processes of the other four pilot regions was largely influenced by local stakeholders and as such may not have had sufficient human capacity during the initial phases of the CMA establishment period, except for the Breede Overberg which has managed to establish its CMA (BOCMA).

The Inkomati river basin is highly characterised by water scarcity and a high rural population accounting for approximately 67% of the river basin population with poor access to water resources. At the start of the reform process a wide array of stakeholder were getting concerned with the prospects of water scarcity in the future that would come about as a result of redistribution of water resources, mostly from commercial farmers to HDIs. Thus, water scarcity on the part of HDIs and the prospects of an eminent water scarce future in the basin for the multiplicity of stakeholders became a driving force to participate in the establishment of the Inkomati CMA. Indeed, CMAs are meant to be stakeholders-driven institutions that should allow participation in water resource management decision-making (Karar *et al*., 2011).

5.2.1 Stakeholder Participation in the Inkomati CMA Establishment Process

Stakeholder participation in any form of decision making is seen as an attempt at empowering stakeholders. The process of the Inkomati CMA establishment strived for stakeholder involvement at all levels in the river basin. It has been observed (WRC, 2003) that in areas where there is a dense population and/or the water resource is scarce or contested, people actively participate. In the Inkomati WMA, stakeholder mobilization was initiated by the DWA RO, which acted as a lead institution in the decentralisation process as noted above. Taking cognisance of the fact that the Inkomati CMA was the first CMA to be setup, South Africa had no previous experience in engaging key stakeholders in the decentralisation process of water resources to the basin level. The identified stakeholders in the Inkomati river basin had thus participated for over seven years in the Inkomati CMA establishment process and indicated that they were beginning to suffer from “participation fatigue” due to the prolonged process (Chikozho, 2005).

Subsequently, some stakeholders involved in the process begun to question the objective of the whole process. They viewed the whole process as an academic exercise that did not seem to end.

- **Stakeholder Identification**

The DWA RO in Mpumalanga was responsible for the identification of stakeholders during an engagement process with them. The engagement process with stakeholders started in 1997. Meetings were held simultaneously in all three separate catchments of the river basin. The meetings were initially probing in nature because they were meant to identify 'key role players' and tabling of water resource management issues. The meetings were held before the 1998 water Act was passed and also before the WMAs were delimited. Thus the meetings were guided by existing policy and draft legislation. DWA RO and other stakeholders were wary of the expected changes that would come with the 1998 Water Act that was in the process of being enacted into law as they deliberated (DWAF, 2001).

- **Formalisation and Engagement of Stakeholders**

The identified stakeholders were either contacted by phone or were written to officially by DWA officials. Each time new stakeholders were identified they were also contacted and motivated to participate in the proposal development process for the establishment of Inkomati CMA. DWA officials travelled to historically disadvantaged communities and companies to hold meetings with them. In cases where participants had incurred transport costs, they were reimbursed (DWAF, 2001). However, Anderson (2005) is quick to point out that obtaining genuine representation from disadvantaged communities is a huge challenge as shown in the participatory process of the Inkomati CMA establishment. Some representatives attended meetings to seek transport reimbursement or free lunch that was provided by DWA RO. In the long run, Catchment Forum meetings were used in order to establish Catchment Steering committees (CSC) whose main composition was the major water users and interest groups in the river basin. Participants in the CSCs acknowledged the varying degrees of water resource

usage in the basin. This prompted other basin stakeholders to propose for a separate CMA in each Catchment. This was seen as an unrealistic option, hence other means guarantying planning autonomy of each Catchment under the auspices of one CMA were explored (DWAF, 2001).

5.2.2 Challenges in the Inkomati CMA Stakeholder Involvement Process

There were several challenges that were encountered in the participatory process of establishing the Inkomati CMA. Challenges ranged from legitimate stakeholder identification to the engagement of disadvantaged communities in difficult decisions over scarce water resources in the basin (Anderson, 2005). However, a detailed list of challenges is as follows:

- The challenge and difficulty of involving stakeholders, particularly Historically Disadvantaged Individuals (HDI).
- The challenge to capacitate stakeholders and to bring them to a point where they can discuss matters on a level playing field.
- The potential dominance of organised sectors.
- Limited resources available for the process.
- Confusion about who needs to be involved, namely individuals or groups.
- Inadequate clarity on what is expected from the process, distinguishing between the needs for consultation and empowerment (capacity building).
- Limited agreement around the approaches to ensure involvement.

Cleaver (1999) points out that although stakeholder participation in water management is frequently advocated, actually including the poor and achieving substantive stakeholder representation has proven elusive in practice, mostly due to the challenges cited above. This observation was evident in the Inkomati CMA establishment process. Despite several years of stakeholder engagement, indications are that public awareness programmes in the Inkomati CMA process were not fully effective. For instance, in a recent survey of the Inkomati CMA

awareness commissioned by DWA, involving ten focus groups each comprising 6–8 representatives from urban and rural black populations, respondents had no knowledge of the Inkomati CMA (Brown & Woodhouse 2004). This could be attributed to the fact that long delays can create despondency particularly if there has been a time limit on putting the proposal together and suddenly participants are expected to wait months, even years for final acceptance (WRC, 2003).

5.3 THE INERTIA ASSOCIATED WITH THE DECENTRALISATION PROCESS DURING THE INKOMATI CMA ESTABLISHMENT

What initially started as a "top-down" approach for water resources management decentralisation process in the Inkomati WMA largely driven by DWA RO in Mpumalanga, turned out to be a mutually desired process (hybrid / organic)[12], when commercial farmers and other interest groups joined the process. When the 1998 NWA was passed, it became apparent that the Department of Water Affairs (DWA) head office, where the institutional oversight office was located would take the lead in driving the process forward, as was provided for in the NWA. Subsequently, a consultant was engaged to facilitate the stakeholder mobilization and participation process in 1998. This was done with the assistance and supervision of DWA Regional Office (RO) which was receiving institutional oversight from DWA head office (interview, 7). The DWA RO through the consultant that was hired facilitated several meetings that were held in the three separate sub-catchments between 1997 and 1999 with the intention of drafting the Inkomati CMA proposal. Each sub basin then developed a sub catchment proposal for its respective sub basin. Finally the three sub-basins' catchment forums came together in 2000 and amalgamated their sub-catchment proposals to establish one CMA (Inkomati CMA) proposal that was submitted to DWA for consideration. The following is a brief description of joint meetings that were organised to amalgamate the three sub-catchments in the Inkomati river basin.

[12] The "top-down" initiation of the water reform process evolved with an interest from both the DWA authorities and the community in the WMA.

- **Joint Sub-catchment Committee Meetings**

After lengthy deliberations the Komati and Crocodile Catchment Steering Committees (CSCs) and there members came to an understanding that it was better to make joint meetings as they would prove to be effective. It helped members focus on the broader picture of the entire river basin rather than their individual catchments. In May and July of 1999, joint Komati-Crocodile Catchment Committee Steering meetings were held. The deliberations were temporarily suspended to accommodate developments in Sabie-Sand Catchment. This was done to ensure that the CSCs of all the three catchments could move forward joint deliberations on the Inkomati CMA proposal development (DWAF, 2001).

The first joint meeting of all the three CSCs was, therefore, held in October 1999 as Inkomati CMA Reference Group. It was at this meeting where the consultant team was tasked with the responsibility of drafting the first draft proposal for the establishment of the CMA for the Inkomati basin. The draft proposal underwent an iterative process between the Reference Group and the consultant team. At a meeting held in September 2000 the contents and format of the final draft were finally accepted by the Inkomati CMA Reference Group for submission to the Minister of Water Affairs (DWAF, 2001). However, DWA requested for changes to be made to the initial draft proposal and after making the necessary changes, it was later resubmitted in October 2001.

Thus the water resources decentralisation process which started in 1997 was protracted by the iterative process through which the proto - CMA proposal development process had to undergo. The process was vigorously thrust forward by DWA RO in Mpumalanga in the initial stages as noted earlier. The DWA RO was keen to implement the new Water Act that was seen as an ambitious and progressive Act world over. However, this initial thrust lost its momentum when the final CMA proposal was resubmitted to DWA head office through its RO in Mpumalanga in 2001.

Being both the initiator and implementer of the decentralisation reform process of water resource management to the catchment level, DWA RO in Mpumalanga slowly begun to change its position over time and started to drag its feet over the idea of decentralising water resource management to the catchment level. DWA recognized the problem of insufficient participation by smallholder farmers, so by trying to drive the agenda of smallholder farmers it manoeuvred itself into a dilemma, because many smallholder farmers misunderstood the concept of the CMAs (Waalewijn *et al.*, 2005). According to Woodhouse (1995), in a CMA there is not necessarily a balance of negotiation power and there is a significant danger that the new institution will be "captured" by existing powerful interests. It is therefore this reason (Waalewijn *et al.*, 2005) why the process was stalled within the DWA. Unequal access to decision making by some sectors or user groups such as smallholder farmers was not addressed adequately. Hence this had serious implications for the remainder of the process, as the wide-ranging origins of the problem were not addressed. Karar *et al*. (2011) also observe that in the establishment of the Inkomati CMA DWA was not fully prepared.

Through interview 19 (February, 2011), the inertia in the implementation process of the new Water Act (1998) by some senior members of staff at DWA RO was mostly as a result of perceiving over time the new Water Act as a threat to the responsibilities and roles that they were performing in water resource management under the preceding Water Act (1956). The inertia was first reflected in the over-drawn–out CMA proposal development process. Secondly this inertia was also observed in the post proposal development stage where the whole process literally came to a standstill. As such this "dragging feet phenomenon" was something that was thought by some stakeholders to have been schemed within DWA both at the regional and head office. The inertia exhibited by DWA persisted even into the post establishment phase were certain powers that were requested by the Inkomati CMA could not be delegated to the CMA when it requested for these additional powers to be granted to it (interview, 1).

Despite the inertia that was observed (cf. Waalewijn *et al*., 2005) in the process of drafting the CMA proposal and lengthy unexplained delays for Inkomati WMA, it still turned out that, of the five pilot WMAs that were selected to have their CMAs

established, Inkomati WMA was the only catchment that had made serious headways. The Inkomati WMA was the first to develop its CMA establishment proposal. It managed to have its CMA established at the time when the water reforms were being rolled out in the water sector of South Africa. This is partly explained by the fact that the Inkomati CMA had continued to receive institutional support from the national DWA office given that the Inkomati CMA establishment process had reached a very advanced stage. However, in 2004 the Inkomati WMA was granted the right to have its CMA established by DWA head office (through the minister) after seven years of protracted stakeholder consultative processes and political negotiations (Anderson, 2005).

To date the other three pilot regions Crocodile West and Marico, Mvoti to Mzimkulu and Olifants WMAs have not yet established their CMAs in their respective WMAs. This delay is partly explained by the fact that when the institutional realignment process was embarked on by DWA, the establishment process of CMAs was put on hold in all the WMAs. However, it cannot be ascertained as hypothesised in the second hypotheses of the study that, during the Inkomati CMA establishment process there was a better collaboration between the DWA head office and the RO in Mpumalanga. Though Karar *et al*. (2011) note that during the transition between the establishment and full functionality of the CMAs, DWA and the CMAs have to work closely together.

The findings of this study further revealed that Inkomati CMA establishment process had been propelled deep into the establishment process before DWA head office started the institutional realignment process (interview, 1). The realignment process that was embarked on by DWA was an effort to ensure that functions and responsibilities were not being duplicated by the various organisations under the new water institutional arrangements. The institutional realignment process was a national initiative at governmental level. It is not something that was started by DWA but rather by the ministry of finance-National Treasury. It was more of an external initiative that was beginning to influence the pace of CMA establishment not only in the pilot regions but country wide since it was implemented across the country.

The idea of the realignment process was to subsequently reduce the number of organisations reporting to the minister and is expected to provide stronger governance within the new organisations (Karar *et al.*, 2011). Some of the stakeholders that were interviewed observed that, the institutional realignment process was partly responsible for the observed diminishing momentum in the CMA establishment process in the Inkomati WMA, the Breede Overberg WMA and the other three pilot regions that have not set-up their CMAs (interview, 1 & 7). This observation has some element of truth, however, the observation can be partly counter-argued on the basis that, the Breede Overberg WMA pushed to have its CMA established even when institutional realignment was still taking place. This special case is partly explained by the fact that DWA decided to re-draft its list of priority pilot areas and strongly favoured the establishment of the Breede Overberg CMA and chose to put the other three pilot regions Crocodile West and Marico, Mvoti to Mzimkulu and Olifants WMAs on hold as was disclosed during interview 1. Table 5.4 below provides a summarised comparison of the initiation and establishment process of CMAs in the five pilot WMAs.

Table 5.4: Initiation and establishment process of CMAs in Pilot WMAs

Water Management Area	Year of submission of CMA establishment proposal	Who initiated the CMA process?	Structures underlying establishment of CMA	Number of Catchment Forums established
Crocodile West and Marico	August, 2002	DWAF Gauteng and a consultant	Catchment Forums	9
Olifants	November, 2002	DWAF	Action Group	1
Inkomati	October, 2001	DWAF	CMA Reference Group	3
Mvoti to Umzimkulu	November, 2002	DWAF	Proposal Development Working Group	30
Breede	October, 2001	DWAF and Breede River Basin Study (BRBS)	Stakeholder committees not Catchment Forums	-

Source: WRC, 2003

5.4 WATER POLITICS IN THE INKOMATI CATCHMENT MANAGEMENT AGENCY FORMATION PROCESS

Since water is fluid and does not recognise political (administrative) boundaries there is a need to discuss the politics that are associated with water governance and the decentralisation process of water resources management. Wester et al. (2003) view the delineation of river basin boundaries, the structuring of stakeholder representation and the creation of institutional arrangements for river basin management as political processes that evolve around choice. In a Water Resources Strategy Paper (World Bank, 2003) the paper concedes that "water resources management is intensely political." Water and politics literature distinguishes three levels of politics namely, hydropolitics – concerned with official sate and inter-state politics regarding water. The second level which is our main interest is the politics of water resources policy - it is mainly concerned with policy formulation and implementation as a politically contested domain. While the third level is the everyday politics of water use: it is more concerned with the day to day contestation of water use (Mollinga, 2001). The third level may help us to determine the functioning of Inkomati CMA and is discussed in chapter six.

The term “politics” is normally associated with the uncalled for meddling by politicians in activities that are perceived to be better handled by experts in the relevant field - such as social planners and engineers (professionals) in the case of water management. The term may carry a negative connotation in water management. Broadly defined, a dictionary definition of politics is “the art and science of directing and administering states and other political units.” However, in the same dictionary quoted, politics is also defined as “the complex or aggregate of relationships of men in society especially, those relationships involving authority or power, any activity concerned with the acquisition of power and manoeuvres or factors leading up to or influencing (something)” (Mollinga, 2001). Hence, ‘politics’ do not refer only to political party competition. Haywood (2002) asserts that politics is the predominant process determining how water (among other) resources is shared between potential uses, and the balance between environmental, economic and social values of water.

Following from the above, politics inherently becomes part of water resource management. For example Waalewijn *et al.* (2005) point out that there was friction within DWAF during the Inkomati CMA establishment process. On the one hand, the NWA stipulates that there should be deregulation, delegation and decentralisation of decision making, but on the other hand DWA saw it necessary to have a strong influence in the CMA establishment process by ensuring that biased forms of organisations (such as Irrigation Boards) ceased to exist.

The position taken by DWA was necessitated by the fact that the 1956 Water Act consolidated the system of riparian rights resulting in commercial white land-owning farmers having proportional access to flow of water under the riparian doctrine. In commercial agriculture areas, the IBs that administrated the allocation of water resources were serving the needs of these farmers. Whereas HDIs did not have sufficient (financial) capacity to get access to the administration for establishing water rights while private black landownership was not allowed (Raven, 2004). Woodhouse and Hassan (1999) make a similar observation and state that, the 1956 Water Act recognised Irrigation Boards as legitimate bodies responsible for the distribution water resources. However, through the promulgation of the 1998 Water Act powers that were vested in Irrigation Boards are being subdued as Water User Associations are being created to perform the functions that were traditionally performed by Irrigation Boards. Irrigation Boards (interview 7) are still very strong in Inkomati WMA and have continued to perform their functions. According to Jonker *et al*. (2010), the conversion of IBs to WUAs seems to be a political imperative rather than a water governance necessity

Thus, “politics” in the water context of the Inkomati WMA has to do more with power relations among the key stakeholders in the river basin. DWA for instance is responsible for the collection of revenues in the WMA, while the stakeholders in the river basin have no authority and powers to decide on the distribution of the revenues that are collected by DWA for water abstraction by different users in the WMA. The desire to exercise power by Irrigation Boards was also noticed during the Inkomati CMA project proposal development phase when Irrigation Boards demanded to have two seats on the Inkomati CMA board on the basis that they were the major water users in the basin. Commercial farmers are a well-organised

group (Irrigation Boards) and seem to have a strong leverage over black emergent farmers who have not had any formal interaction with DWA in the past. Smallholder farmers often do not speak the same language or have the same discourses as the officials at DWA, experts, and commercial farmers who share the same cultural dispositions and have been interacting for years (Waalewijn *et al*., 2005). Therefore, political engagement should be appreciated as a catalyst for public involvement and change (Butterworth *et al.*, 2010).

During the Inkomati CMA formation process forum meetings were held in each sub-basin at which disadvantaged groups where represented. The three sub basins have different political, cultural, economic and social set ups which made it difficult for the three sub basins to get together to form one proposal for the Inkomati CMA. Chikozho (2005) is quick to point out that, forums for dialogue carry the impression that they are fair and inclusive and as such it is important to note that when forums are designed and controlled by those in power they may become superficial by excluding and including some stakeholders. As such water reforms have been found to pose great institutional and political challenges which are considered to be more complex and problematic than other reforms at the local level (Wester, 2003). Further Waalewijn *et al*. (2005) contend that the political process of establishing water management institutions at the local level strongly depends on collaboration. This is so because water management readily gives rise to intractable problems, especially where competition for water is acute. Likewise, water management institutions and policies are contested as the outcomes of political practices.

The limited water resources in the Inkomati river basin particularly in the (Komati and the Crocodile River sub-catchments) pose severe constraints on people's economic and social welfare, increasing conflicts and threatening their livelihoods (DWAF, 2007). It has further been observed that the Inkomati WMA is still in a water deficit, with water requirements exceeding the available resource by a substantial margin in both the Komati and Crocodile catchments after taking into account the allocation to the ecological reserve (DWAF, 2008c). Furthermore, because of the historical inequality in the previous water allocation the majority of historically disadvantaged communities were not allocated water for productive

purposes, other than in former homelands. It has been observed that conflict around water is as a result of the inequitable allocation and use of water resources - the result of a regulatory framework that favours one party, or water development projects which may give one party more access to water resources than others (Gleick, 1993). Over the last couple of years, the DWA regional office in Nelspruit has received a large number of licence applications from emerging users in terms of section 21(a) but has not been issued because of non-availability of water at the required level of reliability of supply (DWAF, 2007). Besides the current severe water stress, other factors are also placing an increasing pressure on the situation regarding the availability of allocable water. Below is a brief highlight of some of these potential factors:

- The Inkomati is an international river and South Africa as a signatory of the Southern Africa Development Community (SADC) revised protocol on shared watercourse, has obligations to "*advance the sustainable, equitable and reasonable utilisation of shared watercourse*" taking into account the watercourse states concerned. The Interim Inco-Maputo Agreement (IIMA) provides the framework for water sharing and sharing of benefits between the Republic of Mozambique, the Kingdom of Swaziland and the Republic of South Africa. The downstream state has expressed concern that South Africa is not always honouring its obligations in accordance with the original Piggs Peak Agreement.

- The economy of the Inkomati WMA has been growing significantly particularly in the non - agricultural sectors and will need to be supported by allocating sufficient water to sustain this growth. This represents a shift to increasing industrial and domestic water demands. This will entail reallocating water resources from the agricultural sector and is likely to face resistance from the commercial farmers, thus heightening the river basin politics.

- The successful implementation of the smallholder irrigation schemes such as the Nkomazi Irrigation Expansion Programme (NIEP) has stimulated

demand from emerging users of water for irrigation purposes. This is evident by the number of applications from previously marginalised communities who formerly had no access to water for productive use. This has also brought about mistrust between some emerging farmers and commercial farmers who share the same irrigation facilities. Emergent farmers purport that some commercial farmers use up more water by pumping water during peak hours, a practice which is against the IB rules. However, the commercial farmers engaged in the practice have denied the assertion and claim that they use “balancing dams” that have been constructed on their private properties to improve water storage. It is not necessarily true that white commercial farmers abstract more water than their legal entitlement compared with their black counterparts (Interview, 11).

- The quality of the water dependent ecosystems has been deteriorating over the years because of the amount of water being abstracted to drive the economic activities such as hydropower generation as well as non-flow related issues such as land-use management. The ecological water requirements (the Reserve) to maintain the functioning of the aquatic ecosystems, although determined at a comprehensive level in some of the catchments, such as the Crocodile sub-basin have not been implemented in the rest of the WMA (interview, 13). Some interest groups in the WMA fear that, the implementation of the ecological Reserve is likely to reduce the available water for the allocation process. The introduction of the ecological reserve is likely to be received with reservations especially by HDIs if it not well explained to them.

Following from the above, there are several stakeholders with competing uses of water resources in the Inkomati WMA. The Inkomati being an international river basin, pressure is exerted on the management of water resources on the portion of the basin that lies in South Africa in order to meet international obligations. Economic growth in the river basin has also heighted the demand for water resources to support production in the basin. Strategies aimed at reallocation of

water resources to formerly HDI groups also poses a great challenge to the already constrained water resources in the river basin. As a result, there are vested interests among stakeholders to collaborate with one another to ensure that they control the new water management institutions (CMA and WUAs). Struggles among actors for access to and use of water resources are still visible. For instance, ESKOM gets priority access to water for power generation over other stakeholders (users) in the WMA (interview, 24).

5.5 SUMMARY

Chapter 5 provided a discussion on the initiators and drivers behind the pioneering establishment of the Inkomati CMA. Initiators of the decentralisation process of water resource management to the basin level were identified and their motivation was also discussed. The DWA RO was identified as the key initiator of the reform process thus signifying a top-down decentralisation approach. DWA RO was not only an initiator but also an implementer of the process. The duo role of initiator and driver that was played by DWA to a great extent determined the pace at which the reform process was rolled out. It was noted that the decentralisation process was motivated by the proactive approach taken by DWA RO in an attempt to implement the 1998 Water Act. The Inkomati river basin being an international river basin drew human resource from countries that it shares the water resources with. Hence during the process adequate institutional capacity was built and became one of the significant drivers in the reform process coupled with water scarcity acting as a stimulant for the reform in the river basin.

However, the reform process at a later stage experienced some inertia which was mainly a result of insecurity concerns by some DWA officials who feared losing their relevance. A multiplicity of stakeholders joined the reform process with vested interests, for instance commercial farmers wanted to maintain their status quo in terms of water use where as HDIs wanted to see a re-distribution of scarce water resources in the river basin. Thus the stakeholder involvement process was rigorous and resulted in “participation fatigue” which may have caused the process to lose “stakeholder legitimacy”. Politics in the CMA establishment process where

equally at play but were more to do with power relations between DWA and irrigation boards. Politics are necessary in the water reform process provided they are not based on political party affiliation as this would result in losing the objective of the reform process. A comprehensive comparative study could not be done for the other four pilot WMAs due to insufficient time and financial resources to collect primary data.

CHAPTER 6

CURRENT OPERATION AND POTENTIAL CHALLENGES OF THE INKOMATI CMA UNDER "INITIAL FUNCTIONS"

6.1 INTRODUCTION

The purpose of this chapter is to establish whether the Inkomati CMA has developed enough capacity and whether it has sufficient financial and institutional support from other stakeholders in the river basin to undertake the functions that were assigned to it after its inauguration. The chapter starts by taking a critical look at the functioning of the Inkomati CMA and its governing board since its inception. During the period under review the Inkomati CMA was tasked to carry out its initial functions as provided for in the National Water Act 36 of 1998 (NWA). The chapter further explores how the functioning of the Inkomati CMA has been influenced by other key stakeholders such as traditional authorities. It also tries to show how some key stakeholders in the river basin are trying to change the approach in setting the price of water tariff based on the business plan of the Inkomati CMA. The chapter also discusses the funding profile of the Inkomati CMA. Then it proceeds to discuss the transformation of Irrigation Boards into Water User Associations. The chapter finally looks at the current problems and potential future challenges that the Inkomati CMA faces after having received the newly delegated powers from the minister of Water Affairs in December 2010.

6.2 FUNCTIONING OF THE INKOMATI CMA AND ITS GOVERNING BOARD

The following sections attempt to describe how the Inkomati CMA has been functioning and how it has carried out the functions that have been delegated to it since its inception, using qualitative data. A description of the characteristic composition of the Inkomati CMA governing board is also given.

6.2.1 The Inkomati CMA and its initial functions

When the CMA started its operations, it assumed its initial functions as stated in Section 80 of the national water Act which makes reference to Chapter 2 and Section 79 of the same Act: The initial functions included:

(a) "to investigate and advise interested persons on the protection, use, development, conservation, management and control of the water resources in its water management area;

(b) to develop a Catchment management strategy;

(c) to co-ordinate the related activities of water users and of the water management institutions within its water management area;

(d) to promote the co-ordination of its implementation with the implementation of any applicable development plan established in terms of the Water Services Act, 1997 (Act No. 108 of 1997);

and

(e) to promote community participation in the protection, use, development, conservation, management and control of the water resources in its water management area (RSA, 1998)."

Senior management (interview 1 & 13), at the Inkomati CMA indicated that the CMA has carried out its initial functions in accordance to its expectation since it has been able to draft the Catchment Management Strategy (CMS): a document that details how the catchment water resources will be managed now and in the future. Management at the Inkomati CMA stated that the initiative of drafting the CMS in-house with no external expertise apart from a facilitator who facilitated at a workshop that was organized to put together the document, to a great extent earned the Inkomati CMA the opportunity of receiving the additional functions as outlined in schedule 3 of the NWA. The CMA has assumed additional functions

which were delegated to it on 17th December, 2010 by the Minister of Water Affairs (interview, 1). See attached additional functions in appendix B of the study.
According to interview 1 (February, 2011), the additional functions have been delegated to Inkomati CMA because the CMA had demonstrated to DWA that it was able to perform the initial functions that it was tasked with. The in-house drafting of the Inkomati CMS was a responsibility that was given to the Water Resource Planning and Programmes unit of Inkomati CMA. It was done in such a way that first the executive manager of the planning unit had to buy into the board the idea of drafting the Inkomati CMS in-house. The governing board agreed and gave consent to the planning unit to go ahead with the idea. Subsequently, the planning unit developed the Inkomati CMS to its final logical conclusion by building on the status quo report that was produced by consultants who were initially engaged by DWA to draft the CMS for the Inkomati CMA.

Based on the achievement of successfully drafting the CMS in-house the Inkomati CMA further requested from the minister if it could implement the new operating rules on river flow, that include measurement and monitoring of water resources for the Crocodile sub basin that were developed by DWA head office. This emanated from the fact that the operating rules that were in place for the crocodile sub catchment were out-dated. This function is a very strategic one, one through which DWA head office has ensured its power over water management over the years, so it's not anecdotal at all if ICMA can now claim this function and expertise. The Minister of Water Affairs was agreeable to their request and the function was then given to the Inkomati CMA since the RO did not have the capacity to implement the project. The Crocodile River Operating Committee (CROC) a committee of various stakeholders in the Crocodile sub-catchment was then set-up by the Inkomati CMA to implement this task. The software and equipment specifically for this project was then transferred to the Inkomati CMA to be setup in the crocodile sub catchment to determine the river flow on the Crocodile River (interview 13).

It took approximately two and a half years to get the model running. The model was specifically setup for the crocodile because it is the most stressed catchment among the three sub basins in the WMA. The other sub basin Komati has a model

which has been setup by that Komati Basin Water Authority (KOBWA) a bi-national company formed through the 1993 treaty and signed between the Kingdom of Swaziland and the Republic of South Africa were the Inkomati CMA only has representation and cannot influence KOBWA on how the model should be operated. The system currently being used by KOBWA is not as flexible as the one the Inkomati CMA is using in the crocodile sub basin. The model being used by KOBWA makes a decision only once a year on the restrictions that can be carried out in terms of water cuts, in order to maintain a comprehensive ecological reserve. On the other hand the system being used in the Crocodile sub- catchment currently being run by the Inkomati CMA is a Real-Time Decision Support System (DSS). The system has been set up in two different modes namely, the long term projections (6 months to 2 years) and short term operations and management (less than 2 weeks) The Inkomati CMA is also considering developing a model that will specifically be able to predict the reserve in the Sabie-Sand sub basin as well. It is the desire of the Inkomati CMA to have fully functional decision support systems for the entire river basin in 5 years' time (interview, 13).

The Inkomati CMA planning unit (interview, 13) is of the view that if these systems are put in place, it will be able to determine a comprehensive ecological reserve which will be less restrictive for water license applicants. Thus, the tight collaboration with Inkomati CMA and commercial farmers who apparently see a good opportunity in this system as observed. It was revealed during interview, 13 that, currently the reserve is not working well since it was determined on a desktop basis, by making use of historical data which tends to disadvantage some license applicants. It also claimed that the computation of this desktop reserve lacks rigor. The Inkomati CMA believes that the new model approach will help to determine the current flow and will also take into account what is being released by dams. This approach will determine the natural flow with pinpoint precision. This new way of determining the current flow thus renders the classification of category flows unrealistic. For example it was argued that rivers in the Inkomati WMA may not be a category "C" (in the ecological reserve classification) depending on the time of the year and the amount of rain received during the year in question. As such, it may not be appropriate to advocate for the use of a flat line reserve, since the reserve is variable from a spatial and temporal point of view.

Clearly from the above we can deduce that the relationship between DWA RO and the Inkomati CMA has been growing, as evidenced by the responsibilities that are being delegated to the CMA and also through interview 1. This notion is supported by Karar *et al*. (2011) who point out that, it has taken the Inkomati CMA sometime to develop strong working relationships with the DWA RO and that it is expected to see a close working relationship between the two institutions during the transition period and full functionality of the CMA.

6.2.2 The Inkomati CMA Governing Board and its characteristics

When the Inkomati CMA was formally established in 2004, its capacity was low with a lean staff structure and no governing board in place. The board was appointed in 2006 to oversee the operations of the Inkomati CMA. According to (interview 1, personal communication, February 2011), the process of selecting board members followed the procedure described in the National Water Act 36 of 1998 (NWA). It started with the appointment of an advisory committee by the minister of Water Affairs. The advisory committee then received three nominations from each sector in the Inkomati WMA. The nominations were subsequently submitted to the minister of Water Affairs, who under consultation finally appointed the board members onto the governing board of the Inkomati CMA. The Inkomati CMA board was ushered into office through this process. At the start of the operations of the board there were thirteen board members from different sectors in the WMA that were selected onto the governing board of the Inkomati CMA. At the time of field work, there were only ten of the original board members still representing their respective sectors. One of the vacancies was created by the South African Local Government Association (SALGA) representative who was recalled from her mayoral position by the political party she was representing and this meant that she could no longer represent the SALGA either in her individual capacity or through the political party that she was a member to. This development was purely motivated from outside the governing board of the Inkomati CMA and as such it had nothing to do with the performance of the Inkomati governing board. The other vacancy was created by a board member who was representing the Premiers' office when he decided to change careers and relocated to another city

and the position fell vacant. While the third seat held by the traditional authority regrettably fell vacant due to the untimely death of the traditional authority representative (interview 5, personal communication, February 2011).

It was made clear to the researcher during the survey that some of the members of the governing board of the Inkomati CMA were passive and did not participate fully in the board deliberations. Most of the members who were alleged to be silent during most board meetings are those that represented disadvantaged communities of former homelands (interview 9 and 20, personal communication, February 2011). Observations by some stakeholders (interview 1, 9 and 20) show that the supposedly observed passiveness is partly attributed to low levels of knowledge on water resources which tend to lower their confidence. To a great extent differences in educational levels among board members and personality are also seen as a factor in the inclination of board discussions, which appear to be dominated by some “highly vocal” board members. The situation in the board was further worsened when disadvantaged communities lost their voice (interview 5). This was when the SALGA and the Premiers’ office seats fell vacant. We can assume that it was this voice that gave the disadvantaged communities political representation and most often was the much more vocal one.

The board has not replaced its lost members yet due to the rigorous process through which a board member is appointed to the governing board by the Minister of Water Affairs. The reason for not replacing the vacant positions yet is that since the board had reached its final term of office, there was no need to replace the three lost members. The board was supposed to have been changed in April, 2010 (Interview 1 & 25). Based on interview 25 it was evident that, at the time of fieldwork an advisory committee had just completed the exercise of selecting three representatives from each of the various sectors in the WMA for recommendation to the minister for her consideration. However, some stakeholders that were interviewed felt that there was need to have geographical representation rather than sectoral representation. The sectoral representation can be observed on the current Inkomati CMA governing board representation which is based on socio-economic sectors rather than on geographic regions (interview 1 and 9). Chikozho (2005) cautions that sector representatives should not be short sighted by merely

focusing on sector interests but should strive to take the basin interests as a whole.

6.3 UNAPPARENT ROLE OF TRADITIONAL LEADERS IN THE INKOMATI CMA FUNCTIONING

Even with a 67% rural population in the Inkomati WMA and 9% of the WMA falling in the rural areas, traditional leaders did not play any real significant role in the establishment or in the functioning of the Inkomati CMA (interview 12 and 20). It has been observed that the different tribal groups in the Inkomati WMA do not share homogeneous cultures, religions, traditions, political ideologies and practices hence making it difficult to have one voice to represent them at a given forum. It has historically been difficult to bring together people from different tribal groupings to undertake a common developmental project, for example building a dam in an area that cuts across two villages under different traditional leaders has proved to be problematic in the past (interview 3 and 20).

Despite South Africa's constitution recognising the role and leadership of traditional leaders in the control of communal land and water resources under their tribal authority, their involvement in water resource management is not clear and still remains unnoticeable. The study showed that traditional leaders lost their powers to councillors under the new democratic dispensation. Hence, traditional leaders and municipalities became competing entities from the time municipalities were functionally established in 2002 (interview 5 and 12). However, traditional leaders still retained some powers as demonstrated during the land reform process. In water reform discourse it is equally a necessary condition to discuss the land reform process. To that effect it has been noted that the Inkomati WMA has among the most numerous and largest land claims in South Africa. It is therefore, expected that land reform, under the control of the Department of Land Affairs, will drastically impact the transformation of water users (interview 8).

As the land reform process got underway traditional leaders played an important role in settling land claims. One particular area were the land reform process was

successful was in the Komati sub basin where the majority of land claims were in the form of land restitution. This is a situation where land that was taken away unlawfully is returned back to the rightful owners from whom it was forcibly gotten from during the apartheid regime. Commercial farmers that held large tracks of land gave up some of the land during the land reform period (interview 8).

During the survey it was learnt that TSB Sugar a wholly owned subsidiary of Remgro – a diversified company listed on the Johannesburg Securities Exchange in South Africa participated in this land reform process. As a result of the land reform process a total of 10,000 ha of land that belonged to TSB Sugar was reclaimed and redistributed to small scale sugar cane growers in the former homelands (interview 8). This land is considered as traditional land and as such occupants do not hold title to the land. In the commercial area there are also some redistribution projects which account for about 2% of the total area of which 30% is restitution. TSB Sugar felt that they could not just sit on the sideline and watch the game being played and as such they perceived themselves as a key player in the whole process and wanted to see the land reform become a success so that they did not lose out at the end of the reform process. If TSB Sugar did not choose to participate it could have lost more land than it would have been willing to give up. This in turn would have negatively affected their production of sugarcane and subsequently the amount of sugar offloaded onto the market thus lowering its profits (interview 8). However, the other side of the argument is that, the forces of supply and demand set price. Thus, if the amount of sugar produced was going to decline, this would have forced the industry prices to adjust upwards, in turn negatively affecting the consumers (HDIs inclusive) along the pathway. TSB sugar would still have maintained its profit levels provided it was a large player in the sugar industry.

Being part of the negotiations of the land reform process gave TSB Sugar the leverage to bargain for joint projects with the community where TSB Sugar operates. For example, TSB Sugar now has cooperative model schemes which are meant to service emerging farmers that do not seem to fit in too well in the Joint venture model which is a slightly more complex model that TSB Sugar operates. This strategic position by TSB sugar to bring emerging farmers in the

main stream of the business was in the interest of TSB Sugars' business. TSB Sugar got to keep land that it could have otherwise lost had it chosen to be on the sidelines of the land reform process. Hence, TSB Sugar continued to produce large quantities of sugarcane by utilising its economies of scale. The land claim was fast tracked and resulted in the early collaboration between emerging farmers and commercial entities like TSB Sugar itself (interview 8). Notably TSB Sugar has gone a step further with these collaborations and has constructed a sugar mill that services the emerging farmers as well as some commercial farmers who are located close to the mill in the middle Komati. As such TSB Sugar has a potentially powerful position in the Inkomati CMA because sugar accounts for over a third of the land irrigated in the Inkomati WMA.

6.4 FUNDING PROFILE FOR THE INKOMATI CMA

Funding to the Inkomati CMA over the past five years has been steadily increasing as shown in Figure 6.1 below. However, the funding in the 2009/10 budget year shows that there was a slight reduction in funds that were made available to the Inkomati CMA. This could partly be attributed to the economic meltdown in the world economy that was caused by the financial crisis in the United States of America which in turn had a knock on effect on the rest on the economies globally. As a result of the financial crunch most developing countries saw a reduction in the amount of foreign aid that they received. Subsequently, recipient governments also tightened their expenditure budgets. The Inkomati CMA was forced to down-size its workforce after facing financial constraints in 2008. This action reduced the Inkomati's institutional capacity to perform certain functions as provided for in the NWA of 1998 such as the monitoring of unlawful use of water in the river basin. It is equally important to note that currently the Inkomati CMA has two funding profiles. The first funding pot is a parliamentary allocation that comes from government coffers and the second pot is an external fund that comes from the donor community (interview 21, personal communication, February 2011).

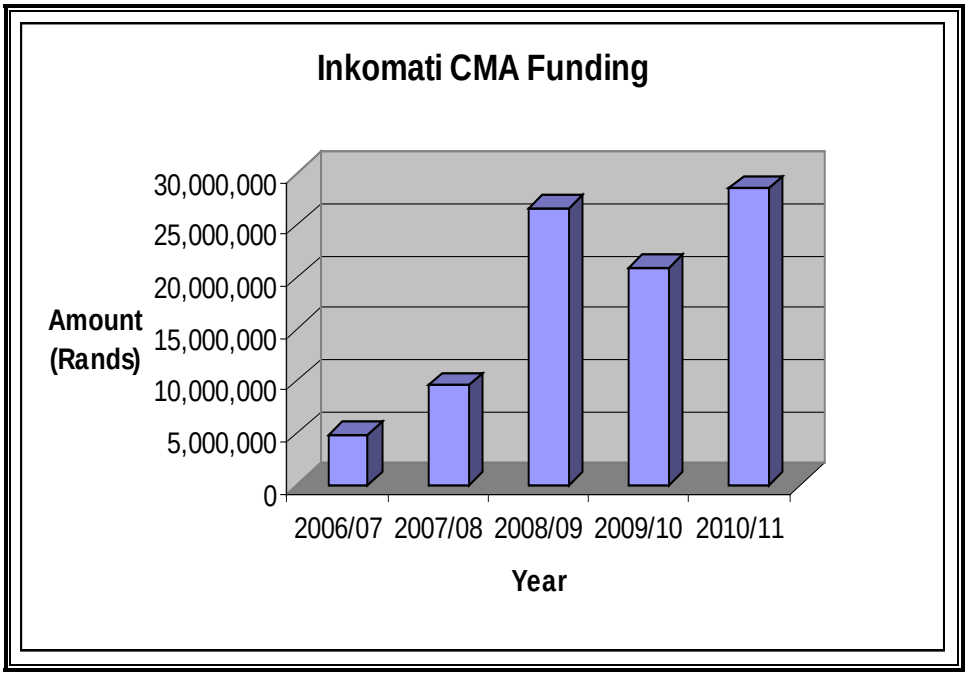

Figure 6.1: ICMA Funding from government 2006 to 2011

Source: Own compilation based on field data

Through interview 1 (February 2011), it was established that, when the Inkomati CMA received its newly delegated powers in December 2010, some of the staff at the regional office of DWA in Mpumalanga have since then been transferred to the Inkomati CMA as full time staff. The move is aimed at enhancing the capacity of the institution to perform its mandated functions. Funding to support the transferred staff at the CMA has also been transferred to the Inkomati CMA coffers thus reducing the stress on the funds from parliamentary allocations and donor support that are mostly used to cover administrative expenses and operational costs for some departments within the Inkomati CMA. It is estimated that, at the end of the exercise of restructuring the Inkomati CMA and receiving its newly delegated powers approximately 47 new positions will be created at the Inkomati CMA with about 28 fully sponsored positions. It is assumed that with enhanced capacity in terms of staff, the Inkomati CMA will be able to do much more in terms of water resources management.

The Inkomati CMA currently has no financial autonomy in the collection and management of river basin financial resources. DWA RO has traditionally performed the responsibility of river basin tariff collection but with the delegation of new powers to the Inkomati CMA this responsibility will soon be transferred to

Inkomati CMA (interview 1, 7 and 24, personal communication, February 2011). This move will certainly boost the revenues that the Inkomati CMA will have at its disposal. According to (interview 24, personal communication, February 2011), it was noted, that in the past DWA did not have a budget on which to base water resource charges. The tariff was set in relation to the annual adjustment in the consumer price index (CPI). It was further noted that, currently there is a new proposed approach in the way water tariffs are going to be set in the Inkomati WMA. Through interview 24 it was revealed that the new approach is “bottom - up” with water users setting the price of the tariff. With the proposed approach, the price will be set at a stakeholders meeting where the Inkomati CMA will first present its business plan and then water users will make their deliberations so that their interests and inputs are reflected in the business plan of the Inkomati CMA. For example, it was pointed out by interview 24 that Eskom is one of the major water users in the Inkomati WMA, which uses about 100 million cumecs of water per annum. Hence, Eskom should have the power to say what they want for the money they pay and as such are in a position to demand that their requests are put in the business plan of the Inkomati CMA. Subsequently, the resultant tariff that will be set by the Inkomati CMA together with the stakeholders will be based on the budget of the business plan that is approved at the meeting of stakeholders in the Inkomati WMA. Stakeholders feel that by setting the price themselves, they will be able to hold the Inkomati CMA accountable for issues such as level of assurance, quality and the price that they ultimately pay for the water resources abstracted (interview 24).

The board member (interview 24) further observed that with the paradigm shift in water resource management, the Inkomati CMA can operate on principles of a private company with a customer oriented kind of view - a notion supported by Karar *et al*. (2011) who liken this approach to the enterprise way of managing CMAs. He also noted that although CMAs are viewed as government institutions, they are different because they are taking the needs of users into account. He claimed that under the new approach, if water users are prepared to pay an increase in the water tariff, it will have to be based on what the CMA can deliver to its clients. But the CMA deliverables are also a factor of the level of resources

(endowment) it has such as capacity of resources, appropriate management skills of CMA staff and management style of the governing board.

Thus, the change in the approach of tariff setting as reflected in the new way of Inkomati CMA functioning where stakeholders are now able to set the price for the water resource tariff signifies the increase and need for strong cooperative governance that was initially weak in the initial stages of the Inkomati CMA establishment process. As pointed out in Chapter 5 section 5.5, Eskom and other stakeholders in the Inkomati WMA are beginning to get much more involved in the recent functioning of the Inkomati CMA.

Figure 6.2 below shows the trend in revenue collection by DWA from water users in the river basin in the last five years. The trend shows that there is some level of acceptance and willingness to pay towards the payment of tariffs among water users as shown by an upward increase on the revenue collection curve from year 1 to year 5. These revenues will certainly be a boost to the Inkomati CMA coffers which currently sources its revenue from government and donors as noted above earlier.

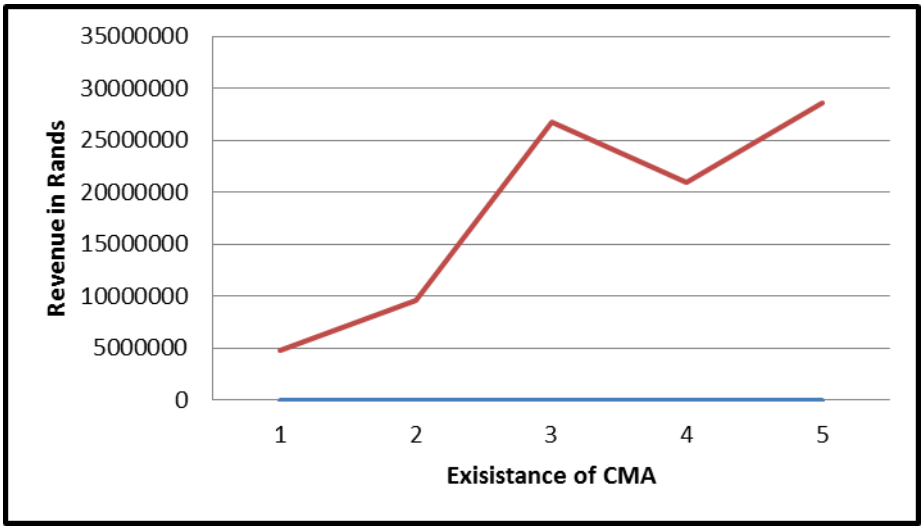

Figure 6.2: Indicating trends in river basin revenues

Source: Own compilation based on field data

6.5 TRANSFORMATION OF IRRIGATION BOARDS INTO WATER USER ASSOCIATIONS

It is important to understand the transformation of Irrigation Boards (IBs) into Water User Associations (WUAs) in the context of this study. New institutional arrangements require that CMAs get support from WUAs in order for CMAs to effectively perform their functions. WUAs are considered as all-inclusive organisations in their composition. The outlook reflected by the Inkomati CMA is partly influenced by how it coordinates its various activities with the WUAs at the local level. It is clearly stipulated in the NWA of 1998, that WUAs are designed to support CMAs though their primary purpose is not water management unlike CMAs. However, the Water Act in chapter 8 recognizes the continuation of operations by existing Irrigation Boards *until they are restructured* as Water User Associations.

Currently the existing 26 IBs in the Inkomati WMA have continued to perform their functions under the 1998 NWA. The survey (interview 11) showed that the IBs have continued to provide services to their members for example in Komati sub catchment where emerging farmers are farming mostly sugarcane which is in turn supplied to the TSB Sugar company, IBs are responsible for supplying water to these emerging farmers. The study also showed that the DWA RO in Mpumalanga has not been keen to ensure that IBs are transformed into WUAs. This is evidently so when you have a situation where less than 1% (2 IBs) of the IBs in the WMA have been transformed into WUAs so far. Backeberg (2005) also notes that the transformation of IBs into WUAs and establishment of new WUAs is very slow. This inertia may lead into the under performance of the CMAs were they have been established considering that WUAs are supposed to serve as support structures.

In the past irrigation boards played a critical role in regulation of water use by making rules for abstraction rates, collection of fees among water users who were mostly white commercial farmers and were also responsible for the enforcement of management rules (Waalewijn, 2005). Field work showed that Irrigation Boards have continued to play some of these roles (interview 11). It was expected that

Irrigation Boards (IBs) would be transformed into Water User Associations following the promulgation of NWA No. 36 of 1998. The Act clearly states that:

> "Within six months of the commencement of this Act a board must prepare and submit to the Minister a proposal, prepared according to section 91, to transform the board into a water user association".

As noted earlier so far only two IBs have been transformed into Water User Associations (WUAs) in the Inkomati WMA. The two WUAs are the Upper Komati WUA and the Elands River Catchment WUA (ERCWUA). During the survey it was revealed that of the two WUAs, Elands River Catchment WUA) has been relatively more active in water resource management issues than the Upper Komati WUA (interview 6). According to the chairperson of ERCWUA (interview 6), the WUA has been performing poorly because all members on the WUA board have been serving on a voluntary basis with demanding commitments from their full time jobs elsewhere. In his opinion he felt that the whole functioning of WUAs has not been thought through by DWA. He pointed out that the lack of thought to the design of WUAs has put their WUA (ERCWUA) in an awkward position because they cannot police water resource management without the necessary tools. He notes that WUAs are supposed to be legally the first level of entry for water users, but water users in the area where ERCWUA operates do not recognize the WUA and as such choose to deal directly with the DWA RO.

Most existing Irrigation Boards in the Inkomati WMA have expressed interest in transforming their Irrigation Boards into Water User Associations. IBs are considered to be more inclusive under the new NWA. To this end some IBs have submitted their applications to DWA for consideration and have not yet received feedback over the status of their applications. In some cases where feedback has been received on the proposed transformation from an IB to a WUA it has been declined, on the basis that they have not met the criteria. For instance Komati Irrigation Board (interview 11) submitted its proposal to the minister about five years ago and when they got the reply from DWA they were told that there wasn't sufficient public participation from other stakeholders in the area where the Irrigation Board operates.

Upon receiving the feedback the Komati responded back to DWA RO, since it is the interface between the IB and the minister. In its response Komati IB stated that the members of the IB are farmers who do not have enough resources to setup meetings with all the people and organizations in the proposed area with the view of incorporating stakeholders that were cited absent by DWA in the proposal for establishing the WUA that was sent to DWA for consideration. Some of the organizations cited absent included those from forestry and environmental groups. However, DWA RO agreed to organize the meetings and appointed consultants to perform the task on behalf of Komati IB (interview 11). The current chairperson of Komati Irrigation Board revealed that he served as the head of the committee which was set up to carry out the public participation for the area in question. However, when the process begun only two meetings were held and the process was discontinued by the consultants. A similar experience was earlier revealed by the chairperson of the Elands River Catchment Water User Association (ERCWUA) formerly Elands Valley Irrigation Board (EVIB) (interview 6). He noted that they had encountered problems in drafting their constitution but successfully managed to draft the constitution in-house with the services of a legal expert.

The deputy chairperson of Komati IB has envisaged some potential future problems with the operations of WUAs. According to (interview 11), it was noted that WUAs are voluntary organizations whose main source of revenue is from the general membership. Hence, farmers are not willing to be part of a WUA that costs them money to retain membership. Asked whether it was not the same with IBs, in his response he claimed that under IBs farmers do not have a choice. He noted that if farmers are irrigating in a controlled area then they must contribute to the IB financially.

Secondly (interview 11), if you have one big WUA that inherits a debt that was contracted from the past transactions of an IB, the members of the WUA are jointly and sever-ably responsible for that debt. Legally all members including those that knew nothing about the debt will have to take part in settling the debt. As such these legal implications tend to scare the sustainability of would be WUAs.

6.6 POTENTIAL CHALLENGES AND PROBLEMS OF CURRENT OPERATIONS FOR THE INKOMATI CMA

The operations of the Inkomati CMA have not been short of existing and potential challenges and problems which range from institutional capacity challenges to developing synergies with other stakeholders in the water sector. The following section explores these potential challenges and problems in greater detail.

6.6.1 Future potential challenges for a better functioning of the Inkomati CMA

The Inkomati CMA is anxious to implement the newly delegated powers in terms of schedule 3 (see attached Appendix B in Appendices for the delegated powers). With the added responsibilities we can therefore, foresee potential challenges for the Inkomati CMA. In order to effectively implement these powers some stakeholders that were interviewed indicated that on the one hand there is need for the Inkomati CMA management to act professionally and not play “politics” (political party politics) as they perform their duties. On the other hand, the governing board of the Inkomati CMA being a politically appointed body by the Minister of Water Affairs should give direction to the Inkomati CMA management for a better functioning of the CMA (interview 4, personal communication, April 2011). It was also noted that if management of the Inkomati CMA is poor, there is bound to be poor performance by the Inkomati CMA even if the governing board was to be well balanced and articulate.

When the Inkomati CMA was functioning using the initial functions there hadn’t been strong links between the Inkomati CMA and municipalities. This purported weak link is partly due to the fact that the two organisations are guided by two different pieces of legislation. The municipalities are guided by the 1997 National Water Services Act whilst the Inkomati CMA is guided by the 1998 National Water Act (interview 22, personal communication, April 2011). However, it appears that there is a thin line between water resources management and water services provision in the Inkomati WMA. A scoping survey that was carried out by DWAF

(2006) showed that some Regional Offices and municipalities in South Africa have raised concerns about the lack of coordination between Water Resource Management (WRM) and Water Services (WS). Thus, there is need for strong working relationships in the Inkomati WMA between the actors on the WRM side and actors on the WS side. The need for strong working relationships in the Inkomati WMA will thus be necessitated by the fact that the Inkomati WMA only has two water boards and a few private companies like *Silulumansi-Sembcorp* that abstracts raw water from the source and supplies it as bulk after treatment and purification to the municipalities, which further reticulate in their respective municipal areas. In the other areas, it is municipalities that perform these functions of abstraction, treatment and reticulation on a limited scale.

The Inkomati WMA has 3 district municipalities and 20 local municipalities. The majority of the local municipalities are responsible for the abstraction and reticulation of purified water in their municipality areas where the private companies and Water Boards are not able to service (interview 5). Therefore, having a close working relationship between the municipalities and the Inkomati CMA will allow for the better functioning of the Inkomati CMA in relation to water resources management activities. By so doing it will place the Inkomati CMA closer to the core face where everything related to water resource abstraction and waste water discharge is taking place, thus reducing high levels of pollution which in turn improves the water resource management. The lack of a close working relationship was also attested to by Bushbuckridge Water Board (interview 4) which revealed that they do not have a very close working relationship with the Inkomati CMA but rather with the DWA RO in Mpumalanga. This is partly explained by the fact that DWA has constantly interacted with these organisations when performing functions of collecting revenue from water use charges and waste water discharge charges and stakeholder meetings.

The issue of water service delivery which municipalities are responsible for tends to over-shadow water resource management in the Inkomati river basin. With the new powers that have been delegated to the Inkomati CMA, the CMA will have to oversee that infrastructure in the WMA is well maintained and were necessary develop new infrastructure in an effort to ensure that municipalities and water boards are able to abstract adequate water to feed their water treatment plants

(interview 2 and 4). A close working relationship between the Inkomati CMA, Water Boards and Municipalities will help to overcome artificial shortages of water resources thus availing more water for domestic use. A case in point is where the DWA RO in Mpumalanga has failed to complete laying a water pipe line through which water is supposed to flow from Inyaka dam to Bushbuckridge Township. This situation has resulted in residents making illegal connections onto existing water pipe lines that are on the reticulation system and this has resulted into leakages and wasteful use of water resources (interview 2 and 7).

There are still incidences of inequality to access and use of water resources among the various water users in the Inkomati river basin. South Africa has a Gini coefficient of 0.96 in terms of water use (Van Koppen in Woodhouse, 2008). This statistic entails that there is a large gap between water use and the equity line thus leaving many people without sufficient water resources for their daily usage. The inequality to access and use of water resources is partly attributed to the poor state of some water infrastructure in the Inkomati river basin. Conceptually related to the above is the aspect of self-financing for most Catchment Councils (Agencies), universally it has been found to be problematic. There is a heavy reliance on donor support, which is not sustainable in the long-run (Dube & Swatuk, 2002). The case is not very different in the Inkomati river basin, where the Inkomati CMA receives a grant from government coffers and the donor community to finance some of the activities it undertakes (interview 21).

The river basin continues to face several problems and challenges, which influence the overall functioning of Inkomati CMA. In the former homelands, Formerly Disadvantaged Individuals continue to face significant power imbalances in terms of knowledge and expertise compared with established white commercial farmers and other elite interest groups. This was evident through the field survey where there was a sharp contrast between emerging farmers and commercial farmers in the Komati in terms of water use (interview 9, 10, 11 and 14). There is information asymmetry between the two groups with emerging farmers claiming that some commercial farmers' use up more water than allocated to them by pumping water during non-pump hours which they abstract from "balancing dams".

6.6.2 Synergies in the Inkomati Catchment

During the establishment of the Inkomati CMA there were not many synergies that were initiated among the key players in the river basin. For example, Eskom has indicated that, moving forward it would now like to participate on the requisite forums established by the Inkomati CMA by seeking collective action with other water users in the Komati sub basin (interview 24). This will ensure that the amount of water that flows down to its power generation plants in the Olifants is guaranteed. The lack of synergies (cooperative governance) in the Inkomati CMA establishment is something that was also echoed, at Ehlanzeni district municipality. It was noted that there is some level of interaction between the municipality and the Inkomati CMA but the two organisations have never had a close working relationship. The apparent lack of synergy is partly attributed to the fact that, during the period when the Inkomati CMA was drafting its proposal Ehlanzeni district municipality was also not formally established on the ground. Municipalities in South Africa became fully functional in 2002.

6.7 EMERGING PATTENS AND LESSONS

This section provides emerging pattens from the Inkomati WMA that can be drawn from interviews with various key stakeholders. In Table 6.1 below, the different roles that were played by some key stakeholders during the establishment of the CMA and perceptions held are given.

Table 6.1: Roles and perceptions held by some key stakeholders

Stakeholder	Role	Perceptions
DWA – Head Office	Was responsible for providing financial support to the reform process and institutional oversight.	They viewed the WMA as an experimental basin to establish a CMA.
DWA – Regional Office	Was responsible for leading the reform process together with the consultants that were engaged to facilitate at stakeholder meetings.	They were interested in championing the redress of in-equity to access and allocation of water in the WMA.
Commercial Farmers	Commercial farmers dominated in the meetings since they were more knowledgeable about the water resources in the WMA through their activities in the irrigation boards.	They perceived the water that they had rights to as their entitlement. They became nervous with the new developments on the water front.
Emerging Farmers	They did not play a major role other than bringing legitimacy to the stakeholder consultative process. They had very little knowledge on water resource management in the WMA.	They perceived the white commercial farmers as a group that was using up most of the water for irrigation and leaving very little for them
HDIs	Their main role was to bring legitimacy to the stakeholder consultative process.	Their perception was that they would now start receiving clean drinking water in their communities. They were more concerned with water services and not water resource management activities.
Other stakeholders	Played a passive role during meetings	They did not think that they were affected by the water resource management reforms.

Source: Own compilation

Table 6.2 summarises the patterns and lessons emerging from the interviews and discussions with various stakeholders.

Table 6.2: Pattens and lessons emerging

Stakeholders	Emerging Patten	Lessons
ICMA and ERCWUA	The ICMA was able to draft it CMS in-house and ERCWUA was equally able to draft its constitution in-house. Initially both organisations had engaged consultants but after the budgets were exhausted the works stalled. There is now a belief that a lot more can be done using in-house expertise.	Organisational capacity should be built in the new organisations that are being created
Inkomati CMA Governing Board	HDI representatives on the board are passive most of the time during board meetings. A trend that was exhibited during the establishment of the CMA	There is need to nominate names of board members in the HDIs based on their competencies despite their political affiliation. If member are passive the concerns on their representatives will not be taken on board and hence will continue to be marginalised.
Traditional leaders	Traditional leaders have not played a key role in the water reforms but have been instrumental in the land reform process. The two resources are inter-linked and should not be detached from each other. Traditional leaders feel that their powers have been sucked by councillors who appear to be playing their roles by virtue	Traditional leaders should be actively involved in the water resource management activities. Traditional leaders and councillors should not be seen as competitor. The two organisations should complement each other's efforts.

	of their political affiliation.	
WUAs	The establishment of new WUAs and the transformation of IBs into WUAs has been extremely slow. It is similar to the process of establishing CMAs which has also been slow.	The functioning of the CMAs is dependent on the lower support structures such as the WUAs which are seen as more inclusive structures compared to IBs.
Water Service Providers	Relations between the Inkomati CMA and Water Service Providers are still weak. They still enjoy better relations with the DWA regional office	If strong relations are not developed between the two entities, it will not improve water resource management in the WMA

Source: Own compilation

6.8 SUMMARY

The chapter provided a detailed discussion on the functioning of the Inkomati CMA since its inception in 2004 by taking a retrospective view. The governing board of the Inkomati CMA was appointed by the minister following the laid down procedures. The study showed that board has not been changed even after having reached its full term. The board has continued to function without the members whose seats fell vacant. The seats that fell vacant represent the voice of the most vulnerable groups in the WMA and as such these groups do not have a strong voice on the board and will have to wait until a new board is selected. The situation in the board has been worsened by some members who dominate discussions. There should be an effort to ensure that the board that will be ushered in is balanced in terms of discussions in the interest of the Inkomati CMAs' functioning and performance. There is thus a need to have geographic representation on the board rather than sectoral representation which is currently obtained.

The achievements of the Inkomati CMA under the initial functions have been notable, for instance the CMA managed to draft its CMS in-house without the assistance of consultants. This shows that the Inkomati CMA has developed sufficient capacity to perform additional functions. Funding from government to the Inkomati CMA has been increasing over years. It has also been shown that revenue generated in the river basin has been increasing steadily. The transformation of IBs into WUAs in the WMA has been very slow and this could potentially threaten the future functioning and performance of the Inkomati CMA.

CHAPTER 7

CONCLUSION AND RECOMMENDATIONS

7.1 INTRODUCTION

The purpose of this chapter is to give the conclusions and recommendations of the study. It first provides a brief summary of the study and goes on to give the conclusions of the study, after which it proceeds to give the follow-on lessons and recommendations for water governance decentralisation reform process in South Africa based on the study findings. Specific recommendations are given for Catchment Management Agencies (CMAs) as well as government. It finally lays down the limitations of the study and it makes suggestions for future research based on the limitations of the study.

7.2 SUMMARY OF THE STUDY

The study adapted the methodology that was developed by Kemper *et al.* (2006) and Blomquist *et al.* (2008) as its method of inquiry. This methodology has been used in several studies in most parts of the world. It is the first time the methodology is being applied in an African river basin - Inkomati. The methodology employed a case study approach and made use of semi-structured interviews that were guided by an open set of questions and partly by some sections of the questionnaire that served as a template. Three stakeholders in the river basin, two of whom were from Inkomati CMA and the other from the DWA Regional Office in Mpumalanga, filled in three different sections of the questionnaire that required technical responses. The questionnaire failed to capture the story behind the early establishment of the Inkomati CMA. Information was therefore collected through interviews because they proved to be much more useful in that they were more informative and provided an opportunity to clarify and probe further on issues that were raised during the interview sessions.

The goal of the study was to establish how the Inkomati WMA was relatively more successful at establishing its CMA compared to the other four pilot regions. The study was able to give an account of this observed phenomenon with some limitations. It thus looked at the factors that may have contributed to the successful establishment of the Inkomati CMA. It first looked at the motivation behind the selection of the Inkomati WMA as a priority river basin. Knowing what drove the initiation has implications on the nature of the public participation process and consequently the level of success observed in the establishment of proposed CMAs. Eventually, the study was able to derive knowledge about favourable and unfavourable conditions in a CMA establishment process. Since it was premised that the establishment process consists of two equally important moments: the pre-establishment process leading to a CMA being officially gazetted and a post-establishment process consisting of the time-laps between an officially existing CMA and a CMA actually undertaking its delegated functions-functioning CMA, hence the study also tried to understand the functioning of the Inkomati CMA as well.

The Inkomati WMA was not the only priority zone designed to set up its CMA to oversee the management of water resources in the catchment. National government through DWA also identified four other regions namely Olifants, Breede, Crocodile West and Marico, and Mvoti to Mzimkulu WMAs (DWAF, 2004b), as catchments that were equally deemed water stressed and needed to decentralise water resources management urgently to the river basin level. Hence, the study attempted to make a comparison with four other pilot WMAs. However, the study was not able to undertake a true comparative study due to material (financial) limitations for field investigations and time constraint, thus the comparison is based on work that has been done by other researchers and the interview data of this study. Therefore, the main research question of the study was: “why the Inkomati CMA establishment process had been more relatively successful than the other four CMAs in the pilot “water stressed regions” that were given equal priority status in their establishment?”

The research question above was formulated under the assumption that, asking interviewees for the reasons responsible for the slow pace in establishing CMAs in

the other experimental pilot sites would help understand factors of success. It is therefore, asserted that asking about this phenomenon will assist to put the study on track to determine success factors. The development and coverage of irrigation boards (IBs) within a basin is a critical factor, which determines to a large extent the commercial farmers' mobilization capacity. Hence the study hypothesised that the more Irrigation Boards (IBs) with sufficient institutional/organisational capacity in a river basin, the greater the chance for a CMA to get support from agricultural grass-root level in its establishment process. Based on the data that was collected, hypothesis 1 could not be rejected. The second hypothesis that the study made stated that: compared to the other four pilot regions, the Inkomati CMA benefited from a "better collaboration" (there were minimal lapses in information sharing between the departments) between the Department of Water Affairs (DWA) in Pretoria and the DWA Regional Office (RO) in Mpumalanga province. Hypothesis 2 could not be tested since a comprehensive comparative study could not be done for the other four WMAs and also interviewees appeared to have little to say on that issue.

The Inkomati CMA being the first CMA to be established in South Africa serves as a reference point for the establishment of other CMAs in the country. Lessons can thus be drawn from the experience of the Inkomati CMA establishment process as listed in section 7.3 below. Karar *et al*. (2011) also note that the establishment of BOCMA was a lot smoother because of the lessons learned in the Inkomati CMA establishment process. The study initially interrogated why the Inkomati WMA was given the first priority by DWA in establishing its CMA, however, the responses to this question were inconclusive and as such it was not pursued further. Indeed, it is not certain that there has been a real strategy that was followed by the national government in the selection of the Inkomati WMA. While doing fieldwork, we came to the conclusion that that the selection of the WMA might have been more pragmatic actually at the national level. Several factors were identified as key to the decentralisation process in Inkomati WMA. These include among others contextual and initial conditions in the river basin, the decentralisation, and basin level institutional arrangements. See appendix E for a detailed account of some of these factors identified as potentially related to successful development of basin-

scale decentralized institutional arrangements for Integrated Water Resource Management in the Inkomati river basin.

As pointed out earlier, a thorough comparative case study investigation for the other four pilot regions (Crocodile West and Marico, Mvoti to Mzimkulu, Breed and Olifants) WMAs could not be carried out. This was due to limited information and knowledge on the four other pilot regions possessed by the stakeholders that were interviewed in the Inkomati WMA, contrarily to what we had expected. There is also inadequate secondary data available to enable a comprehensive comparison to be conducted. Loss of institutional memory in the DWA partly contributed to the failure to obtain relevant empirical data that would have enabled an effective comparison to be conducted between the Inkomati WMA and the other four pilot regions. The study's main focus therefore, shifted to a process tracing of how the Inkomati CMA pioneered the reform process.

7.3 MAIN FINDINGS OF THE STUDY

The study has shown that the proactive approach that was taken by the Regional Office of DWA in Mpumalanga played a substantial role in the pioneering establishment of the Inkomati CMA. It is not well documented however whether or not other regional offices also played an instrumental role in the other four pilot regions. It is therefore difficult to isolate this element as a critical factor explaining the successful establishment of ICMA. Karar *et al*. (2011) point out that, DWA has initiated and driven all the processes of CMA establishment without having to wait for stakeholders to express the need. However, if the other four pilot regions, at some point, equalized with the developments in the Inkomati WMA of institutionalising the CMA in the WMA, only ICMA and BOCMA has so far completed the establishment process. Indeed, progress has been made in some WMAs such as the Breede Overberg, which has recently established its CMA (BOCMA) and has also completed the preparation of its Catchment Management Strategy (CMS) with the assistance from Inkomati CMA. The study findings indicate that there is a positive correlation between the high number of IBs and CMA establishment process in ICMA and BOCMA, demonstrating the instrumental role that commercial agricultural organised interests play in CMAs' establishment

process. It has been assumed that the organisational and mobilisation capacity of IBs is positively correlated to this high number of IBs per WMA, yet this information could not be confirmed as time constraints during field work did not allow collecting the necessary data on these aspects.

According to some of the actors see for example interview 1, it was noted that the implementation of the institutional realignment process by DWA coincided with the establishment of the CMAs in the five pilot regions. The realignment process further delayed the establishment of the CMAs in the other pilot regions except for the Inkomati CMA which had already gained momentum at the time of implementation of institutional realignment process. The study further showed that, the Inkomati CMA has adequate human (institutional) capacity and there was political will from government during its establishment. Adequate human capacity and political will are necessary factors in the establishment of CMAs in South Africa. Adequate human capacity ensures that, when the CMA is established, it is able to perform key functions that are outlined in the National Water Act (NWA) of 1998, such as the drafting of the respective CMSs by the ICMA and the BOCMA.

Equally, political will and commitment from the government are necessary drivers for the decentralisation of the water reform process as observed during the establishment of the ICMA. It is clear from the findings of the study that, politics were at play during the establishment process of the Inkomati CMA. The river basin politics had more to do with the power relations among the key stakeholders like DWA at the regional level and commercial farmers who had vested interests in the management of water resources in the river basin. Commercial farmers had controlled the use of water resources through Irrigation Board for a long time. This stems back from a past which had instituted agriculture (commercial farmers) with powers to regulate and control water resource use in the river basin prior to the 1998 Water Act. The study also confirmed that the Inkomati river basin had more existing IBs compared to the other pilot regions that have not established their CMAs.

The study was able to explore the functioning of the Inkomati CMA and its governing board. The governing board of the Inkomati CMA has continued to perform its responsibilities even after having reached its full term, which expired in

April, 2010. A significant aspect for the continued functioning of the Inkomati CMA is the institutional capacity that has been developed over the period of its existence. Adequate capacity that has been built in the Inkomati CMA has contributed to the CMA developing its Catchment Management Strategy in-house without the services of consultants. The consultants that were initially engaged to develop the CMS for the Inkomati CMA failed to complete the process in the agreed timeframe and were thus partly held accountable for the delay in the completion of drafting the CMS for the Inkomati WMA. The fact that the ICMA could demonstrate that it was able to draft its CMS on its own without the use of consultants, ensured that it was not stopped by the institutional realignment process. Doing away with the services of consultants is indeed one of the key distinguishing factors of the ICMA from the other four pilot regions. The ability of Inkomati CMA to manage the Real-Time Decision Support System (DSS) for water resources management purpose was also instrumental in the recent delegation of power to ICMA according to some key stakeholders. We can infer that it plays a positive role in the decision of DWA to not stop the establishment process of ICMA during the institutional realignment process.

The study had the intention to test the two hypotheses that were formulated but it turned out during fieldwork that it was not possible to collect data that was needed to test the hypotheses on a comparative basis. Investigations in the Inkomati WMA could not permit the study to completely validate the study hypotheses in their entirety. Testing the study hypotheses qualitatively could not be done considering that empirical data was not collected in the other four pilot regions. In the series of interviews that were conducted during fieldwork in the Inkomati WMA, questioning was extended to solicit information on the other four pilot regions though this had a risk of biasness. However the plan was to control this possibility by cross-checking information obtained. The strategy of interviews was to ask people to account for what happened elsewhere but unfortunately, it did not work out that way.

Thus, since a true comparative study was not done based on sufficient empirical data but rather on partial secondary data for the other four pilot regions, the hypotheses can only be considered with some level of caution. In support of the first hypothesis of the study, findings from (Bourblanc, 2011) also indicate that the

only two established and functional CMAs in the country (ICMA and BOCMA) had relatively more IBs compared to the rest of the pilot regions. We accounted for the interest of TSB in supporting black emerging farmers through cooperatives to grow sugarcane which they later supply to sugar mills owned by TSB. Again, this supports our claim that organized agricultural interests (in that case a processing company) play an instrumental role in the establishment process of a CMA. Based on the available evidence, therefore, hypothesis 1 cannot be rejected. Though it was mentioned that the DWA RO in Mpumalanga played a proactive role in the Inkomati CMA establishment process, it was not mentioned by anyone that the case was otherwise in the other four pilot regions thus the second hypothesis of the study is inconclusive. The study also shows that there is a correlation with human capacity and the establishment of a CMA as well as the initial conditions that exist in the river basin at the time of the decentralisation reform as pointed out in Blomquist et al (2008). Findings also showed that the WMAs that have managed to establish their CMAs have a strong agricultural base and have lower GDPs compared to those WMAs that have not yet established their CMAs, indicating again that organized agricultural interests had played a major role in the establishment process of CMAs.

In addition, the following lessons could also be drawn from the study, a basis on which some of the recommendations have been coined.

- There is a uniform approach in the establishment of CMAs. This uniform driven process led by DWA has resulted in the uneven progress that has been observed in the other pilot regions. The process of CMA establishment is being driven using a top-down approach.

- The ecological reserve and meeting international obligations for water-sharing between Mozambique, South Africa and Swaziland are also driving transformation of the water reform in the Inkomati WMA. Agreements such as the Inco-Maputo have helped to drive this transformation.

- Traditional leaders were not actively involved in the establishment of the Inkomati CMA. Local authorities (councillors) assumed a much greater role compared to traditional leaders during the establishment process.

7.4 RECOMMENDATIONS

The South African government has a significant role to play in the establishment of CMAs in the nineteen WMAs that were demarcated through the promulgation of the 1998 Water Act. In this regard the following cross-cutting recommendations are put forward for consideration based on the findings of the study.

- There is need for DWA officials to be pro-active in the CMA establishment process of South Africa in WMAs where CMAs have not been established so that they can be established within a reasonable time frame. As shown by the study the proactive approach by DWA officials in Mpumalanga significantly contributed to an earlier establishment of the Inkomati CMA. Though the process of CMA establishment itself should be driven from bottom-up.

- DWA should be able to identify in a given WMA stakeholders with the largest interest and knowledge in water resources use in order to involve them as early as possible. This will help to easily mobilize other stakeholders in the WMA. For instance commercial farmers in the Inkomati WMA got involved right from the start and helped to mobilize other stakeholders in the river basin especially in formerly disadvantaged communities.

- The use of consultants in the establishment process of CMAs should be approached with some caution. Consultants in some cases proved to be ineffective as was shown during the drafting of the Inkomati Catchment Management Strategy (CMS) and in the drafting of the constitution for the transformation of Komati Irrigation Board into a Water User Association.

- The study showed that there were no significant synergies that were developed between the DWA RO and the local municipalities during the Inkomati CMA establishment process. There is therefore, a need for DWA to ensure that synergies are encouraged between itself and other players in the WMAs when establishing CMAs in South Africa, since CMAs are developed on the principles of Integrated Water Resource Management that requires the involvement of other stakeholders in the river basin where a CMA is to be set up.

- There is a need to have sufficient human capacity built at the Regional Offices of DWA when establishing CMAs. A high employee turnover can result in poor implementation of the reform process due to discontinuities and loss of institutional memory. When employees implementing the reform process are transferred the momentum of reform process is slowed down.

- In an event where a sit falls vacant on the governing board of a CMA, provision should be made to have the member replaced in order to continue having representation from the affected sector.

- DWA should seriously consider reviewing proposals to transform Irrigation Boards into Water User Associations that have been submitted by Irrigation Boards where CMAs have been setup in order to improve the functioning of CMAs.

7.5 LIMITATIONS OF THE STUDY

The study only covered the portion of the basin, which falls in South Africa and did not cover the Swaziland and Mozambique geographical boundaries. As such, it did not take into account the activities and the institutional frameworks for water management in both Swaziland and Mozambique sections of the basin. This fact may have influenced the findings of the study especially data that was captured from the lower part of the Komati sub basin which receives water from the Komati river after passing through Swaziland. This was because the three different

portions of the basin in the respective countries are governed by their respective statutory laws (National Water Acts) which could not simultaneously be considered for this study that was confined only to the South African portion of the basin. Time and financial resources also did not permit the researcher to undertake surveys in the other four pilot regions simultaneously for this study. This may have biased the comparison that was made between Inkomati WMA and the other four pilot regions, which was based wholly on secondary sources.

Loss of institutional memory in some organizations like DWA RO due to high employee turnover has also been cited as a factor that may have reduced the quality of primary data that was obtained. In some cases non response during field interviews to some questions in the questionnaire resulted in making inferences based on secondary data. This may have limited and influenced the discussion of the study.

7.6 CONCLUDING REMARKS

The pace of establishing new organisations in South Africa's water sector is still a source of concern among several stakeholders. Only two CMAs (Inkomati and Breede Overberg) are functional after more than a decade's existence of the new legislation. During the same period only six CMAs have been gazetted administratively. In the Inkomati WMA only two Irrigation Boards have been transformed into Water User Associations. The Inkomati CMA has managed to develop its CMS and has finally been delegated its powers in terms of schedule 3 by DWA. The Inkomati CMA will now be able to manage the water resources in the Inkomati WMA, a function that was previously performed by the DWA RO in Mpumalanga.

The initial design of the study was not able to collect all the relevant information needed, but it was re-designed through use of semi-structured interviews and the conclusion follows. In particular the study was not able to make a comparison between the successful establishment of the Inkomati CMA and the establishment of CMAs in the other four pilot regions based on empirical data. The questionnaire was not implemented as planned, but instead interviews were conducted to

capture the information that was intended by targeting identified key informants/stakeholders in the Inkomati river basin. Interviews provided the study with an opportunity to capture information on the early establishment of the Inkomati CMA in relation to the other pilot regions in detail. The intention of the study was to test the two hypotheses that were formulated, but since the fieldwork did not proceed as planned, hypothesis 2 could not be tested. However, we have demonstrated that hypothesis 1 could not be rejected. This therefore, entails that IBs and organizational capacity plays an instrumental role in CMAs establishment process. If the study was not constrained with time and financial resources, the level of organisation could have been described in detail by addressing issues such as “membership”, “financial resources”, “social capital” and “mobilisation capacity” described through a 5 point scale (from poor to excellent) for a comparative study in the other pilot regions.

The study has also shown that the selection of Inkomati as the lead WMA by DWA was pragmatic since no actual strategy was put in place. Based on secondary data the study was able to show that pilot WMAs with a strong agricultural background have been able to establish their CMAs compared to pilot WMAs with a strong urban set-up which have not managed to establish their CMAs. The study also shows that there are still power imbalances and poor knowledge (information asymmetry) concerning water resource management in the Inkomati river basin. The initial fifth objective of the study was not achievable, and subsequently this resulted in reformulating the objective. Instead of measuring performance of the Inkomati CMA, it was then reformulated with a view of addressing the functioning of the Inkomati CMA, since its formal establishment in 2004. In order to have a successful establishment of CMAs in South Africa, political will and organisational capacity are necessary ingredients for this exercise to become a reality. The government also needs to expedite the process of the institutional re-alignment process so that the establishment process of CMAs can continue.

7.7 AREAS FOR FURTHER RESEARCH AND QUESTIONING

Based on the limitations of the study above, the study was not able to address all possible institutional and political aspects related to the establishment of the Inkomati CMA without exceeding the scope of the study. The study has however, provided the fundamental issues which are important in understanding the factors responsible for the pioneering establishment of the Inkomati CMA. Indeed a great amount of research still remains to be done in this area and the study makes the following suggestions for future research:

- A study that can incorporate the New Institutional Economic (NIE) analysis framework would greatly assist to unpack the characteristics of the actors in the water reform sector and their true motivation in the participation of these reforms.

- The study has highlighted the drivers/factors behind the pioneering establishment of the Inkomati CMA but was not able to isolate causal effect of each of the factors in explaining the decentralisation process. Therefore, future studies should consider exploring this area.

- Future studies should consider incorporating the 1998 National Water Act (NWA) and 1997 Water Services Act (WSA) in the analysis with the view of harmonising the two Water Acts. This will reduce the duplication of the roles played by the key players in the water sector such as Water Boards, Municipalities as well as CMAs'.

- A study that can undertake fieldwork in the other four pilot regions using the same methodology as a build-up on what this study has done in the Inkomati WMA will be much more informative.

- How will the power relations play out between major water users such as commercial farmers and the Inkomati CMA in view of the newly delegated powers (schedule 3) to the Inkomati CMA?

- With the delegated powers, will the Inkomati CMA be susceptible to elite capture by some major interest groups in the river basin as purported by others? Or is the CMA likely to turn out into another bureaucratic structure in a different form?

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APPENDICES

Appendix A: River Basin Organization (RBO) Questionnaire

1. RIVER BASIN IDENTIFICATION

Basin: _____ Country:_____

RBO Name: _____

RBO Address: _____

_____

_____

Contact Person: _____ Position: _____

Board Member: _____ Non Board Member: _____

Telephone: _____ Fax: _____

2. RIVER BASIN CHARACTERISTICS

2.1. River basin population: Total_____ Rural (%) _____

2.2. River basin geographical location including geographical boundaries:_____

_____

2.3. Countries that share the basin: _____

2.4. River basin area (square km) _____

2.5. River basin main rivers _____

2.6. River basin annual climate data (precipitation, temperature, evaporation)

_____

_____

2.7. River basin annual surface water resources (Million cubic meters per year)

_____

_____

2.8. River basin annual surface water availability per season:

Dry season (Million cubic meters) _____

Wet season (Million cubic meters) _____

2.9. User types (e.g. domestic, industrial, irrigation, hydro, environmental uses) and share of use of the basin's surface water:

User Types	**Share of Basin Water (%)**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

2.10. What is the share of types of water: Percentage (%) of users that use?

Types of water	**Percentage (0-100%)**
1. Ground water only	_____
2. Surface water only	_____
3. Both ground and surface water	_____
4. Other	_____
5. Other	_____
6. Other	_____

2.11. List and describe other river basin resources (vegetation and soil type, fisheries, and other natural resources)

_____

_____

_____

2.12. What is the distribution of basin land area per sector?

Sectors	**Basin Area (km^2)**
Agriculture	
Forestry	
Urban zones	
Other (name_____)	
Other (name_____)	

2.13. Area irrigated by crop.

Type of crop	**Area (ha)**
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

2.14. What are the types and quantities of infrastructure (canals, reservoirs, dams, water treatment, etc.) including their capacity in the basin?

Type of infrastructure	Quantity	Capacity (m^3)

3. DECENTRALIZATION PROCESS

Part A: Establishment Process of Inkomati CMA

3.1. In your opinion, are there any special characteristics about Inkomati river basin that make it uniquely different from the other two pilot river basins that were equally given priority in establishing their respective CMAs?

Yes _____ No_____

If yes, what are they?

_____

_____

3.2. In your opinion, what are some of the factors that made Inkomati CMA establishment much more successful than the other CMAs in the two pilot regions that were also selected?

_____

_____

_____

3.3. Do you believe that regional offices which were already existing prior the New South African Constitution have an advantage over the other new created regional offices (in new South African provinces) as regard national policy implementation issues or exchanges with actors within the province?

_____

_____

3.4. Is Mpumalanga regional office of the DWA a new regional office? What about the other two cases?

Yes_____ No_____

3.5. Did Inkomati CMA establishment process receive more funds compared to the other pilot regions?

Yes_____ No_____

If yes, how substantially different was it?

_____

3.6. Has the same level of political will exhibited in the establishment of Inkomati CMA, been maintained in the establishment of other CMAs? If not, why so?

_____

_____

3.7 Who are some of the actors and organizations that were instrumental in the initiation and establishment of ICMA?

_____

_____

3.8 What were the specific motivation of these particular actors and organizations in the ICMA establishment process?

_____

_____

_____

3.9 Is there a link between the way farmers are organized in the area and the pace of CMA establishment process?

_____

3.10 Would you say that the more organized, strong and far-reaching (cover a large extent of the area) irrigation boards are in a particular region, the more support for a CMA establishment process?

_____

_____

3.11 How has the lengthy delay between the formal establishment of ICMA and its effective operational starting date affected participation of stakeholders in the functioning of the agency?

_____

_____

3.12 Could you explain why, to your knowledge, there has been such a delay?

_____

_____

_____

3.13 In developing a catchment management strategy, what difficulties were encountered in the process if any?

_____

_____

Part B: Laws, Acts and Decrees

3.14. Describe the development of water related issues (laws, decrees, acts, etc.) in the country following chronological order.

_____

_____

3.15. Have the local people contributed to the development of water related issues (laws, decrees, acts, etc.): *1. Yes; 2. No*

3.16. If yes to question 3.2., who was more active in crafting the rules?
1. Politicians; 2. Government officials; 3. Traditional structure and local people: 4. Other_____; 5.Other_____

3.17 How often these rules are broken by the local people?
1. Never broken; 2. Seldom broken; 3. Regularly broken; 4. Not followed at all.

3.18. In your opinion, did the present water laws contribute to decentralization of water resource management? *1. Yes; 2. No.* Why?

_____

_____

3.19. What are the main objectives of the water law in the country?

_____

_____

3.20. To date, are those objectives attained?
1. Not at all; 2. 25% attained; 3. 50% attained; 4. 75% attained; 5. 100% attained

3.21. Period (years) that the decentralization took place in the country_____

Part C: Institutions

3.22. What was the Year that the River Basin Organization was created? _____

3.23. What was the type of devolution of the River Basin Organization reation?
1. Top-down; 2. Bottom-up; 3. Both

3.24. Who came up with the first idea of forming the River Basin Organization?
_____
_____

3.25. Who created the River Basin Organization?
1. Government; 2. Private sector; 3. Civil society; 4. Local community; 5. NGOs6. Other_____

3.26. Have the local people contributed to the development of the River Basin Organization? *1. Yes; 2. No*

3.27. If yes to question 3.15, who was more active in creating the River Basin Organization?*1. Politicians; 2. Government officials; 3. Traditional structure and local people4. Other_____; 5. Other_____*

3.28. Can you explain in detail the River Basin Organization creation process?

_____

_____

3.29. Describe the existing institutions that had to be dismantled in the decentralization process at national level.

_____

_____

3.30. Describe the new institutions that had to be created in the decentralization process including their role and administrative power in the country

_____

_____

3.31. What are the existing institutions at river basin level that had to be dismantled in the decentralization process?

_____

_____

3.32. What are the new institutions at river basin level that had to be created in the decentralization process?

_____

_____

3.33. Can you name the new institutions created by local people/local river basin stakeholders?

_____

_____

3.34. Have water user association been established? *1. Yes and 2. No.*

3.35. If yes in question 3.22, how many and what are their degree of involvement (in percentage from 0-100%) in water resource management?

_____

_____

3.36. If water user associations have not yet been established, what are the difficulties that have been encountered in this process?

_____

_____

3.37. What were the costs of creating institutions due to decentralization process?

New institutions	**Other 1**	**Other 2**	**Other 3**
1. None	1. None	1. None	1. None
2. Low cost	2. Low cost	2. Low cost	2. Low cost
3. Medium cost	3. Medium cost	3. Medium cost	3. Medium cost
4. High cost	4. High cost	4. High cost	4. High cost

3.38. In developing the river basin organization, what are the difficulties that have been encountered in the process if any?

_____

_____

3.39. What are the main objectives of the River Basin Organization?

1. Flood control; 2. Water scarcity; 3. Water conflicts; 4. Assuring water quality; 5. Other_____

3.40. To date are those objectives attained?

Flood Control:	Water Scarcity:	Water Conflicts:	Assuring water quality	Other
O N/A	O N/A	O N/A	O N/A	O N/A
O 1 (0% success)	O 1 (0% success)	O 1 (0% success)	O 1 (0% success)	O 1 (0% success)
O 2 (25% success)	O 2 (25% success)	O 2 (25% success)	O 2 (25% success)	O 2 (25% success)
O 3 (50% success)	O 3 (50% success)	O 3 (50% success)	O 3 (50% success)	O 3 (50% success)
O 4 (75% success)	O 4 (75% success)	O 4 (75% success)	O 4 (75% success)	O 4 (75% success)
O 5 (100% success)	O 5 (100% success)	O 5 (100% success)	O 5 (100% success)	O 5 (100% success)

3.41. Can you please provide the River Basin Organization organigram?

3.42. Explain the roles of each element of the organigram

_____

_____

_____

3.43. Can you please provide the composition of governing body of the river basin organization including the type of stakeholders (water users) that they represent as well as the level of education?

Name	**Type of water user**	**Education**

3.44. Explain the process by which the Governing Body of the River Basin Organization was selected

_____

_____

_____

3.45. Does the River Basin Organization have human capacity to manage water resource at basin level? *1. Yes; 2. No*

3.46. Is a more numerous and skilful human resource capacity in Inkomati river basin a distinctive variable in explaining the relative success in the establishment of ICMA as compared to the two other pilot regions?

_____

_____

3.47. Are there capacity building programs for the River Basin Organization's stakeholders? *1. Yes; 2. No.* If yes, explain the types of capacity building (training courses, seminars, study tours, etc

_____

_____

_____

3.48. On a scale between **1**and **5**, with **5** being the highest score how can you rate the capacity of Inkomati CMA in terms of changing the situation on the ground?

_____

_____

3.49. Is Inkomati CMA able to function autonomously?

Yes_____ No_____

3.50. If not, why not?

_____

_____

3.51. In your opinion does Inkomati CMA possess the capacity to redress the past inequality to water access (practically) in the river basin?

Yes_____ No_____

3.50. If yes, in what way has it been able to address this aspect? And if not, why not?

_____

_____

3.51. Has Inkomati CMA been able to address gender inequality to water access?

Yes_____ No_____

3.52. If yes, how has it been able to do so? And if not why not?

_____

_____

3.53. Explain the laws of the land and decrees that govern the River Basin Organization. Please provide your answer using chronological order.

_____

_____

Part D: Finance

3.56. Do you measure your basin's revenues? *1. Yes; 2. No*

3.57. If yes in question 3.35, please indicate the basin's yearly revenues and the basin population in the past five years.

Year	Revenues	River Basin Population
2010		
2009		
2008		
2007		
2006		

3.58. What is the value of the river basin's revenues by sector?

Sectors	Revenues
Agriculture	
Forestry	
Industry	
Other (name_____)	
Other (name_____)	

3.59. What is the value of water Tariffs for different water users (if possible provide rates for various major users):

Water Users	Water tariffs
Irrigation	
Industry	
Domestic	
Other_____	
Other_____	
Other_____	
Other_____	

3.60. Can you indicate the percentage of users paying tariffs for the different water users? Indicate in table below using the following choices of percentage of water users paying tariffs: *1. Not applicable; 2. 0%; 3. 25%; 4. 50%; 5. 75%; 6. 100%*.

User group	Percentage who pay
Irrigation	
Industry	
Domestic	
Other_____	
Other_____	
Other_____	
Other_____	

3.61. Which percentage of the tariff payments stays in the basin and which percentage goes to other destinations? Which destinations?

_____

3.62. Percentage of tariffs staying in the Basin: *1. Not applicable; 2. 0%; 3. 2 5%; 4. 50%; 5. 75%; 6. 100%.*3.63b.

3.63 Percentage of tariffs going to other Destinations: *1. Not applicable; 2. 0%; 3. 25%; 4. 50%; 5. 75%; 6. 100%.*

3.63.1 What are the destinations of water tariff? _____

3.64. Extent/activities of private sector involvement in basin investments (e.g. water supply, water treatment, reservoir construction, basin infrastructure maintenance): Percent Private Involvement: (*1. Not applicable 2. 0% 3. 25% 4. 50% 5. 75% 6. 100%*)

_____

3.65. What is the annual budget of the river basin organization? _____

3.66. What are the major sources and their contribution for the annual budget?

Sources	**Percentage (0-100%)**
Government	
Private sector (name_____)	
NGOs (name_____)	
Stakeholders at River Basin	
Other (name_____)	
Other (name_____)	

3.67. What is the distribution of the annual budget in percentage among different activities at River Basin?

Activities	**Percentage (0-100%)**
Investment	
Development	
Water quality	
Capacity building and meetings	
Other (name_____)	
Other (name_____)	

3.68. Does the River Basin Organization have the necessary authority/independence in managing water resources? *1. Yes; 2. No.*
If No Why_____

3.69. Are some of the decisions made by the River Basin Organization delayed by the government? *1. Yes; 2. No*.

3.70. If yes to question 3.69, how do you rate the impact of these delays on service delivery? *1. None; 2. Moderate; 3. Severe*

Part E: Information sharing

3.71. How often the River Basin Organization call for a meeting?

1. Never; 2. When need rise; 3. Twice a year; 4. Quarterly; 5. Monthly

*6. Other*_____

3.72. Can you rate the participation of stakeholders at the meeting? Percentage of members attending the meeting (0-100%)_____

3.73. What types of issues are frequently discussed on these meetings?

1. Politics and non water issues; 2. Some water issues; 3. Purely important water issues4. Other _____; 5. Other _____

3.74. What is the percentage of time allocated to each of the following issues at these meetings?

Meeting issue	**Percentage (%)**
1. Politics and non water issues	_____
2. Some water issues	_____
3. Purely important water issues	_____
4. Other_____	_____
5. Other_____	_____

3.75. What are the other forms of information sharing among stakeholders (annual reports, websites, radio, etc.) and explain their effectiveness in communicating to all stakeholders

_____

_____

Part F: Disputes and their Resolution

3.76. Are there forums to hear disputes, how many and which ones?

_____

_____

3.77. What are the main types of disputes/issues that usually need to be resolved?

_____

3.78. How often these conflicts rise? *1. Never; 2. Rarely; 3. Often; 4. Very often.*

3.79. What are the challenges faced by the River Basin Organization in resolving the conflicts?

_____

_____

3. DECENTRALIZATION PERFORMANCE

4.1. Indicators of problems **before** and **after** establishment of the RBO. Please check all that apply in the table bellow for each water resource problem at river basin **before** and **after** de establishment of RBO using the following choices: 1. *No response; 2. No problem; 3. Some problem; 4. Severe problem*.

Water resource problem at the River basin	**Before**	**After**
Water scarcity		
Floods		
Environmental quality		
Land degradation (erosion, salinity, etc.)		
Water conflicts (water allocation, etc.)		
Water storage		
River ecology		
Other (specify)		
Other (specify)		

4.2. Describe the major water resource problems at the river basin before and after the decentralization process in terms of occurrence and consequences.

_____

_____

_____

4.3. Responsibilities for decision making **before** and **after** the creation of the RBO. Please indicate the share of decision making of different levels of governance (municipal, basin, provincial and national) for the areas (water administration, etc.) indicated in table below **before** and **after** the establishment of RBO using the following choices of share (in %) in decision making: *1. Not applicable; 2. 0%; 3. 25%; 4. 50%; 5. 75%; 6. 100%*

Responsibility for:	**Before the creation of the RBO**				**After the creation of the RBO**			
	% at local level (e.g municipality)	% at Basin level	% at state/ provin-cial gov. level	% at national gov. level	% at local level (e.g municipality)	% at Basin level	% at state/provincial gov. level	% at national gov. level
Water Administration								
Infrastructure Financing								
Water quality enforcement								
Setting water quality standards								
Other (please explain)								

4.4. Water Resource Management Instruments: Compare the situation **before** and **after** the existence of the RBO:

	Before RBO	**After RBO**
Existence of water right types (e.g. concessions, permanent rights, short-term rights qualitative or quantitative):	O None O Permanent Rights O Long-Term Use Concession (more than 10 years) O Short-Term Use Concession (less than 10 years) O Permanent Transferable O Permanent Non-Transferable Other:	O None O Permanent Rights O Long-Term Use Concession (more than 10 years) O Short-Term Use Concession (less than 10 years) O Permanent Transferable O Permanent Non-Transferable Other:
Who is responsible for awarding water rights:	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:
Who is responsible for water allocation?	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:

Who is responsible for modeling and forecasting water availability?	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:
Who is responsible for monitoring and enforcement of water quality?	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:
Who is responsible for collecting tariffs?	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:	O N/A O Federal O State/Provincial O Local Government O Regional Organization O National Agency O River Basin Organization Other:

4.5. Describe the reduction in loss of production and productivity due to water scarcity or flooding **before** and **after** the decentralization process?

_____

_____

_____

4.6. Quantify and describe disputes regarding water allocation or water quality **before** and **after** the creation of the River Basin Organization

_____

_____

_____

5. BASINS COMPARISONS

5.1. In your opinion, are there some characteristics about this river basin that make it different from other basins in the country? *1. Yes; 2. No*

5.2. If yes in question 5.1, what are these characteristics and can you please mention the strengths and weaknesses of theses characteristics?

Characteristics:

_____

_____

Strengths:

_____

_____

Weaknesses:

_____

_____

5.3. Any comments or clarifications including annexed material you think may be of value?

APPENDIX B: SCHEDULE 3

POWERS WHICH MAY BE EXERCISED AND DUTIES TO BE PERFORMED BY CATCHMENT MANAGEMENT AGENCIES ON ASSIGNMENT OR DELEGATION

[Sections 72, 73 and 151(1)(l)]

General

1. Subject to Chapter 2 and sections 72 and 73 of this Act a catchment management agency may exercise any of the powers or perform any of the duties set out in this Schedule and any other powers or duties necessary or desirable in order to ensure compliance with the Act, to the extent that such powers and duties have been assigned or delegated to it, and within the constraints of the assignment or delegation.

Power to manage, monitor, conserve and protect water resources and to implement catchment management strategies

2. A catchment management agency may -

(a) manage and monitor permitted water use within its water management area;

(b) conserve and protect the water resources and resource quality within its water management area;

(c) subject to the provisions of the Act, develop and operate a waterwork in furtherance of its catchment management strategy;

(d) do anything necessary to implement catchment management strategies within its water management area;

and

(e) by notice to a person taking water, and after having given that person a reasonable opportunity to be heard, limit the taking of water in terms of Schedule 1.

Catchment management agencies may make rules to regulate water use

3. (1) A catchment management agency may make rules to regulate water use.

(2) The rules made under sub item (1) may relate, amongst other things, to -

(a) the times when;

(b) the places where;

(c) the manner in which; and

(d) the waterwork through which, water may be used.

(3) A water user must adhere to any such rules which apply to that user.

(4) A rule made under sub item (1) prevails over a conflicting distribution condition contained in

any authorisation.

(5) Before making rules a catchment management agency must -

(a) publish a notice in the *Gazette* -

(i) setting out the proposed rules;

(ii).inviting written comments to be submitted on the proposed rules, specifying an address to which and a date before which the comments are to be submitted, which date may not be earlier than 60 days after publication of the notice;

(b) consider what further steps, if any, are appropriate to bring the contents of the notice to the attention of interested persons, and take those steps which the catchment management agency considers to be appropriate;

(c) consider all comments received on or before the date specified in paragraph *(a)*(ii); and

(d) consider all applicable conditions for provision of services and bylaws made under the Water Services Act, 1997 (Act No. 108 of 1997), by water services institutions having jurisdiction in the area in question.

(6) After complying with sub item (5), a catchment management agency must -

(a) finalise the rules; and

(b) make it known, in an appropriate manner, that the rules have been finalised and where they may be read; or

(c) deliver or send a copy of the rules to each water user to whom the rules apply.

Catchment management agencies may require establishment of management systems

4. (1) A catchment management agency may require in writing that a water user -

(a) install a recording or monitoring device to monitor storing, abstraction and use of water;

(b) establish links with any monitoring or management system to monitor storing, abstraction and use of water; and

(c) keep records on the storing, abstraction and use of water and submit the records to the catchment management agency.

(2) If the water user fails to comply with a requirement of subitem (1)*(a)* or *(b)*, a catchment management agency may undertake the installation or establishment of such links and recover any reasonable cost from that water user.

Catchment management agencies may require alterations to waterworks

5. (1) A catchment management agency may, by written notice to the owner or person in control of a waterwork, require that person to collect and submit particular information within a period specified to enable the catchment management agency to determine whether that waterwork is constructed, maintained and operated in accordance with the Act.

(2) A catchment management agency may direct the owner or person in control of a waterwork at the owner's own cost and within a specified period, to -

(a) undertake specific alterations to the waterwork;

(b) install a specific device; or

(c) demolish, remove or alter the waterwork or render the waterwork inoperable in a manner specified in the directive.

(3) A catchment agency may only issue such a directive if it is reasonably necessary in order to -

(i) protect authorised uses of other persons;

(ii) facilitate monitoring and inspection of the water use; or

(iii) protect public safety, property or the resource quality.

(4) If the owner fails to comply with a directive, the catchment management agency may

(a) undertake the alterations;

(b) install the device; or

(c) demolish, remove or alter the waterwork or render the waterwork inoperable,

and recover any reasonable costs from the person to whom the directive was issued.

Catchment management agencies may temporarily control, limit or prohibit use of water during periods of water shortage

6. (1) If a catchment management agency on reasonable grounds believes that a water shortage exists or is about to occur within an area it may, despite anything to the contrary in any authorisation, by notice in the *Gazette* or by written notice to each of the water users in the area who are likely to be affected -

(i) limit or prohibit the use of water;

(ii) require any person to release stored water under that person's control;

(iii).prohibit the use of any waterwork; and

(iv) require specified water conservation measures to be taken.

(2) A notice contemplated in sub item (1) must -

(a) specify the geographical area or water resource to which the notice relates;

(b) set out the reason for the notice; and

(c) specify the date of commencement of the measures.

(3) In exercising the powers under sub item (1), the catchment management agency must -

(a) give preference to the maintenance of the Reserve;

(b) treat all water users on a basis that is fair and reasonable; and

(c) consider -

(i) the actual extent of the water shortage;

(ii) the likely effects of the shortage on the water users;

(iii) the strategic importance of any water use; and

(iv) any water rationing or water use limitations by a water services institution having jurisdiction in the area in question under the Water Services Act, 1997 (Act No. 108 of 1997).

(4) If the owner or person in control of a waterwork contravenes a notice issued under sub item (1), the catchment management agency may -

(a) modify, or require the owner of the waterwork to modify the waterwork so that it cannot be used to take more water than that allowed for in the notice; or

(b) remove the waterwork or require the owner to remove the waterwork if the notice contains a prohibition on the use of that waterwork.

(5) A catchment management agency may recover from the owner any reasonable costs incurred by it in acting under sub item (4) and to recover from the owner of the cost determined

Source: NWA (1998)

OTHER POWERS

34(2)	To register an existing lawful use subject to section 26(1)(c)
35(1)	To verify the lawfulness or extent of an existing water use by written notice require any person claiming an entitlement to that water use to apply for a verification of that use.
92(1)	To establish a water user association, give it a name, determine its area of operation and approve its constitution (i) not operating any Government infrastructure (ii) not employing staff and (iii) that do not have any financial commitments towards DWA (state loans) or (iv) loans other financial institutions guaranteed by DWA
92(1)(b)	To amend the name, area of operation or approve an amendment to the constitution an established water user association to the Inkomati Catchment Management Agency within their area of operation
92(2)(a)	To require additional information to that required by section 91(1)
92(3)(a)	To publish a notice in the Gazette out the proposed establishment of water user association, its name and area of operation and inviting written comments thereon
92(3)(b)	To consider and take what further steps are appropriate to bring the contents of the proposed water user association to the attention of interested parties
92(3)(c)	To consider all comments received on the proposed water user association
92(4)	To decide that sufficient consultation has taken place
98(4)	To transform irrigation boards

	(v) not operating any Government infrastructure, (vi) not employing staff and (vii) that do not have any financial commitments toward DWA (State loans) or (viii) loans at other financial institutions guaranteed by DWA

Source: Inkomati CMA (2011)

APPENDIX C: INTERVIEW LIST

	Name	Organisation	Position
1	Mr. Johan Boshoff	Inkomati CMA	Board Secretary / Legal Advisor
2	Mr. Anthony. Themba	Bushbuckridge Municipality	Operational & Maintenance Manager
3	Mr. Marias Van Rooyen	Dept. of Agric & Rural Dvpt & Land Admin	Chief Engineer
4	Mr. Seerane Zulu	Bushbuckridge Water Board	Acting Director Water Services Division
5	Mr. Derrick Ndlovu	SALGA	Programme Manager
6	Mr. Van Tonder	SAPPI / Water User Association	Environmental Manager (SHEQ)
7	Mr. Johan Van Aswagen	DWA Regional Office	Director Water Affairs DWA Regional Office
8	Mr. Dawie van Rooy	TSB/KNP/ Irrigation Board	Director TSB Sugar
9	Ms Lilian Masilela	NGO	CMA Governing Board Member
10	Mr. B.K Mokoena	Civic/ municipal Councilor	CMA Governing Board Member
11	Mr. Cornelius	Komati River Irrigation Board	Chairperson
12	Inkosi S.A.Nkosi	Mpakeni Tribal Authority	Chairperson of Local House
13	Mr. Brian Jackson	ICMA	Acting CEO
14	Ms Rose / Cynthia Zeran	Dinglidale Irrigation Scheme (Emerging Farmers)	Chairperson
15	Mr. Rueben Liyane	Sabie-Sand Farmers Association (Emerging Farmer)	Chairperson
16	Ms Asainah Khoza	Dept of Environment (Nelspruit Environment Center)	Environmental Officer
17	Mr. Mike	Dept of Environment (Environmental Impact	Environmental Impact Assessment Officer

		Assessment Unit)	
18	Mr. Clemeus Kiessig	Baberton Mines(Fair view mine)	
19	Mr. Sizile Ndlovu	Businessman	Former CEO Inkomati CMA
20	Ms Cynthia Nkuna	Inkomati CMA	Executive Manager Cooperate & Finance
21	Mr P.G. Du Toit	Ehlanzeni District Municipality	Deputy Manager Water & Sanitation
22	Ms Yolanda Oosthuizen	Sembcorp Silulumanzi	Acting Scientific Services Manager
23	Mr. Patrick Ntebeni	DWA	Deputy Director: Institutional Establishment
24	Mr. Nandha Govender	Eskom	CMA Governing Board Member
25	Mr. Nelson Muripa	Emerging Farmer (Dinglidale Irrigation Scheme)	Secretary

Source: Own compilation

APPENDIX E: FACTORS RELATED TO RIVER BASIN DECENTRALIZATION

- **Contextual Factors and Initial Conditions**

The contextual and initial conditions in the Inkomati WMA area appeared most favourable for Integrated Water Resource Management (IWRM). Water management issues in the Inkomati WMA do not appear to have been driven necessarily by ethnic and religious divisions in the river basin. However, past racial inequalities from the apartheid regime and economic development of the river basin appear to have had notable effects. The very establishment of the Inkomati CMA, with the aim of managing water resources at the most lowest appropriate level was anchored on the Water Policy (NWP) of 1997 and the National Water Act (NWA) 36 of 1998 that aim to redress the imbalance in access to water resources in the river basin. The paradigm shift in water resources management was intended to improve access to water resources by HDIs in an effort to reduce poverty hence boosting economic development in the river basin through promoting reallocation of water resources for the expansion of rural agriculture (emergent farmers) and subsequently the expansion of industry. The Inkomati river basin was poorer and more rural than most of the rest of the country, and these conditions contributed to an emphasis on the expansion and protection of irrigated agriculture as the central element of the region's economic and social life. These contextual factors have shaped the perceptions of many Inkomati river basin stakeholders and the Inkomati CMA staff about the principal purposes and appropriate focus of river basin management.

- **The Decentralization Process**

Decentralization in South Africa was implemented vigorously in the late nineties at a rapid pace with a high level of political will exhibited during this period. In the water sector, responsibility for service delivery was devolved from the DWA to municipalities between the years 2000 and 2005, depending on where the reform was being implemented. Key roles were however, redefined with the DWA being confirmed as regulator for the water resource management and the Water

Services Authorities (municipalities and water boards) being made responsible for service provision within their own areas of jurisdiction. The national government through a top-down approach created catchment management agencies. This initiative was also necessitated by local-level demands for greater autonomy as well as the dictates of both the Water Policy (NWP) of 1997 and the Water Act (NWA) 36 of 1998. The decentralisation initiative was also the desire of national government to shed water management responsibilities to CMAs progressively. The establishment of the Inkomati CMA provided a means for stakeholder participation through representation on the governing board. The establishment of basin management institution- Inkomati CMA in the Inkomati river basin thus carried the potential for greater water user involvement, one of the key principal reason for which it was created. While the Inkomati CMA enjoys the recognition of national government officials as the legitimate water resource management entity, such recognition has not been accompanied by an extensive devolution of authority to the organisation.

- **Central-Local Relationships and Capacities**

Basin level organisations such as the Inkomati CMA develop basin level plans such as the “Catchment Management Strategy,” which have to be consistent with the National Water Resource Strategy (NWRS). DWA is still responsible for the collection of river basin revenues in the Inkomati WMA. However, with the delegation of powers in terms of schedule 3, the Inkomati CMA will now be responsible for the collection of river basin revenue in the WMA. However, in WMAs where the CMAs have not been established DWA is still responsible for the overall management of water resources. The new NWA and NWP is certainly beneficial from an IWRM standpoint— bringing more users into the system quantifying and issuing water licenses, maintaining a registry of users, and creating opportunities for trading in water. Implementation and enforcement has also been delegated to the Inkomati CMA. The central government (through the minister) has the authority to alter the governance structure of the governing board or decision making processes of the Inkomati CMA (and to appoint its leadership). Government is able to achieve this by setting up an advisory committee that receives three nominations from each sector in the WMA, which are then

presented to the minister who then chooses one representative from each sector through consultation. The Inkomati CMA has developed sufficient institutional capacity over time. Recently some staff were transferred from the DWA regional office to the Inkomati CMA.

- **Basin-Level Institutional Arrangements**

River basin-level governance institutions correspond with the geographic boundaries (WMA) of the river basin. The Inkomati CMA was established in 2004 and was delegated its initial functions in the same year in order for the organisation to start functioning. DWA remained responsible for most of the water resources management activities in the Inkomati WMA. The Inkomati CMA has recently been delegated additional functions, where DWA will now only provide institutional oversight[13] (interview, 1). However, changes in the responsibilities of the Inkomati CMA that were made in 2010, appear to have been intended to transform the agency into an authoritative river basin governance organization. Institutional boundaries remain unclear due to the ecological-geographic boundary which did not fit the administrative-provincial boundary, hence some difficulties in the management of water resources. Though mechanisms for conflict resolution exist to address conflicts between water users in the WMA, it is less clear how conflicts between WMAs will be addressed. There is also a danger of duplication of responsibilities between local government (municipalities) and the Inkomati CMA. Other basin-level organisations at a much lower level are Water User Associations (WUAs) and Catchment Forums (CFs).

[13] "Oversight in South African context is defined in terms of monitoring/supervision, support and regulation" (Karar *et al.*, 2011).

APPENDIX F: SUMMARY OF MAIN POINTS IN INTERVIEWS

Johan Boshoff (Inkomati CMA, staff member)

On 17th December, 2010 the Inkomati CMA received new delegated powers (Schedule 3) from the minister of Water Affairs. The CMA has now been invited to offer input into the process of Catchment Management Strategy (CMS) development for the Breede Overberg. This resulted from the fact that the Inkomati CMA has managed to develop its CMS and has thus developed sufficient capacity and experience to assist other CMAs develop their CMAs. The process of institutional realignment is currently going on; the process is being expedited in order for the process of establishing CMAs to resume.

Irrigation Boards (IBs) in the Inkomati WMA have continued to operate and still have strong powers that were assigned to them in line with the old Water Act (1956 Water Act). In the past powers were assigned and not delegated as is the case now. There is a big difference between delegation and assignment. The Inkomati CMA would also like to have powers assigned to it rather than being delegated the powers. Since powers were assigned to IBs in the past it is difficult to revoke these powers in line with the new Water Act (1998 Water Act). In accordance with section 86 of 1998 NWA, once powers have been assigned to a CMA it can then delegate to an employee of any water management institution including itself. This way the CMA will be in the position to manage much more.

There are currently two Water User Associations (WUAs) that have been transformed from IBs out of the 27 IBs that were registered in the Inkomati WMA. At the moment, IBs in the Inkomati WMA prefer to work with the Inkomati CMA rather than the DWA Regional Office. The current Inkomati CMA strategic plan and budget have been well prepared compared to the previous years. The CMA has thus gained trust with the work it has done in the past three years. The Inkomati CMA is a water resource management institution, it first was tasked with the responsibility of monitoring river flows and data monitoring. It later became part of river health program. Bio data collection responsibility will now be given to the Inkomati CMA because of the trust DWA has developed in the CMA. The Kruger

National Park (KNP) is one of the partners that the CMA works with. Municipalities are more of water users in the Inkomati WMA rather than water resource management institutions. Plans are underway of opening a data library at the Inkomati CMA offices to assist with water resource management.

The relationship between the Inkomati CMA and DWA has improved in the recent past, and is promoting water resource management. The Inkomati CMA had requested from the minister that schedule 3 be given to the CMA as this was seen to offer more powers to the CMA. The CMA will now be able to do more on water resource management than was done before. Apart from monitoring river flows, the CMA will also monitor alterations to water works and water restrictions

River Operating Rules (ROR) can now be effected by the Inkomati CMA. Sub directorate Staff responsible for water quality management will be transferred from RO to the Inkomati CMA. The Inkomati CMA completed CMS project in-house and was submitted to DWA in April, 2010. This is the document that brought about the change in the mindset of DWA. The process was iterative, the CMA was asked to recommend the delegation. After reviewing the recommendations the CMA was asked to re- phrase and re- formulate the delegation. An agreement was finally made between the Inkomati CMA and DWA on how the delegations should look like. The Breede Overberg also received the same delegations and as such benefited from the negotiations that were done by the Inkomati CMA. The NWA of 1998 is very clear on what can be assigned or delegated, see section 73 in Schedule 3 which states that powers should be assigned and not only delegated. See also Chapter 4 of the NWA on responsible authority. In terms of the application of the NWA the Inkomati CMA has skills and capacity just as much as the DWA to implement the NWA.

The DWA RO office is seen as a duplication of the Inkomati CMA, so the RO will just become a regulatory body. At the local level a lot of issues were clarified. The main regulatory function will start from the head office. Compliance monitoring and enforcement around the country is required. There is no need to have too many departments dealing with water users to avoid confusion. The RO will submit

presentations on how they see the functions of RO in line with institutional realignment process.

Currently everybody is reporting to the minister and it is not controllable. IBs are constituted for smaller geographic areas and report to the minister and it is not practical. There is talk of reducing CMAs to nine instead of nineteen. The nine CMAs will then be reporting to the minister. According to the institutional realignment, the WUAs instead will be reporting to CMAs as opposed to were IBs report to the minister. Geographical areas of existing CMAs will become bigger. Usutu area, Northern natal area, Swaziland and Mozambique area will go to Inkomati. It would be logical to combine the Olifants and Inkomati WMAs since they both drain into Mozambique.

The Inkomati CMA is a public entity and the governing board is the accounting officer. The decisions are made by the governing board as well as policy making. The CMS is informed by the stakeholders. The whole process of developing the CMS was not initiated by the governing board because they are not administrators. The executive manager took up the issue and tabled it before the board for consideration. Only two members on the board are competent with water related issues. The board has representatives who are not experts on water issues but are “watchdogs” that just make the decisions on behalf of the people they represent. They are not required to be experts. Stakeholders need to be guided on the input into the CMS on what should go in and how to do it. You need to give them content of the expected document so that they get guided. You need to make them realise on how to participate and become core owners of the process.

We need to describe the WMA in terms of its characteristics, taking into account the historical perspective. The WMA has traditional areas, approximately 9% of the WMA and contains emerging farmers and other rural stakeholders. Part of the composition of the board is drawn from this sector. Members should be representatives who also make a contribution on the board meetings. Most of the population in the WMA comes from the former homelands. The NWA still has gaps on how it handles issues of board members who no longer represent the sectors in

which they were appointed to represent. Provisions must be made in the Water Act how to take care of such a situation.

RO is playing role of cooperation, coordination and collaboration level. The Inkomati CMA does not report to the RO, it reports to the minister. There was an officer at the DWA head office that did not approve of setting up the Inkomati CMA. Validation and verification of water users is being done by the CMA currently. The money for this exercise is coming from water use charges and does not cover all the costs. Money from main account (national budget-income tax) was used to subsidize the RO. The billing in the WMA will now be done by the Inkomati CMA.

Van Rooyen (Department of Agriculture-Mpumalanga)

There is approximately 12,000 ha of land that is being cultivated for cane growing in the Inkomati WMA by small-scale farmers. The Department of Agriculture is representing approximately 1,200 small-scale cane growers possessing an average 7-10 Ha of land each. The farmers are in projects which are variant, from about 150 Ha with only one pump station that pumps water to the whole 150Ha. In each of these projects there are 15-20 farmers. The bigger projects are those for fig trees, which has about 800Ha with 10 Ha per farmer. All these farmers abstract water from the Komati river. Commercial farmers are located on the Komati river and small-scale farmers are situated on the middle Komati. There are also some small-scale farmers on the Lomati river as well that are represented by the department of agriculture.

There are Irrigation Boards on these rivers, the Komati Irrigation Board on the Komati river and Lomati Irrigation Board on the Lomati river whose members are white commercial farmers. Irrigation boards are sympathetic to the small-scale (emerging) farmers who only cultivate small pieces of land. Small-scale farmers have been metered now after initially having refused to be metered because they did not understand how it all works. They thought they would lose the water so they were scared. They do not realize that it will work to their advantage. The

sugar came scheme is a model for the Inkomati WMA. These farmers (emerging farmers) have been there since 1987.
The Department of Agriculture operates on political boundaries but water is difficult to manage by provincial boundaries and as such DWA RO in Mpumalanga also manages water in the Olifants river basins.

The 12, 000Ha project did not start as 12,000 Ha in1987, the development was done in two phases, the Inkomazi East and Inkomazi West projects respectively. Two consultants were engaged by the department to undertake the development. This development ended somewhere around 1995/96. The reason why this development stopped was that there was no water anymore. So this is when the 12,000 ha project stopped. Farmers are still growing 10 ha because they do not have title to the land and as a result have failed to expand their production. Land is still under traditional title. Small-scale farmers are not motivated because they do not have title to the land, so we need to push for tilting of land that is held by small-scale farmers. Farmers were proactive in the establishment of CMA in the Inkomati WMA.

Komati Joint Operation Forum holds monthly meetings, which are held at KOBWA offices. Discuss issues of water releases and reconcile water that is remaining and how to release it. KOBWA is monitoring the quality of the water that runs in the river system (Crocodile) and (Komati) Waste disposal in the WMA, is checked by the CROC forum so that waste disposal institutions do not dispose off sewerage in the river system. The CROC is a voluntary forum. Projects in the WMA have been initiated by the government, in most cases the local people are not consulted on what they want. There is a top-bottom approach in many cases.

Brian Jackson (Inkomati CMA, staff member, current acting CEO)

The CROC committee was setup by the Department of Water Affairs national office. The DWA needed new operating rules for the crocodile catchment since the existing ones were developed in the past and were now outdated. There is need to engage with the stakeholders to make the model work. RO did not have capacity so the ICMA requested to implement the project. It started 4 years ago. The model

took about 21/2 years. Had no delegated powers in the past, so had a gentleman's agreement. They did this project without the delegated powers.

The model was specifically setup for the crocodile sub-catchment because it is the most stressed catchment in the Inkomati Water Management Area. The Komati sub-catchment has models setup by KOBWA which the ICMA is sitting on while in the Sabie they are trying to develop a model. In 5 years time the Inkomati CMA will have fully functional implementing decision support systems. The system being used by KOBWA is not as flexible as the one the Inkomati CMA is using since they make a decision only once a year on the restrictions. The model in the crocodile sub catchment is more time scale.

Currently the reserve is not working since it was worked out based on desktop arrangements. It tends to disadvantage some license applicants. The model helps to determine the current flow and what is being released by dams and as such you can know the natural flow. The category flow is currently not realistic. It is difficult to know where you stand on the graph, for example, December in a wet year is different from December in a dry year. So what DWA currently gives are just statistics. A flat line for a reserve is not realistic since the reserve is variable. DWA does a desktop reserve which is done in two hours or less.

A comprehensive ecological reserve will be less harsh for license holders. The licence is not well structured since it stipulates the reserve that should be met. The condition on the license should state that they should participate in the operating rules applicable at the time and the reserve applicable. The Inkomati CMA is not implementing the full reserve at the moment. It is implementing half of the reserve at the moment. It is currently a class "C". In winter will implement half the reserve but will implement full reserve in the summer. Integrated water resource management IWRM should be adhered to by the CMA. Implementing the comprehensive ecological reserve should be progressive as stated in the NWA. Starting at 50% and will move forward as the river health is also being monitored.

Van Aswagen (DWA Regional Office)

DWA is the national office and the RO is part of the national setup. The RO is not managed by any provincial office. Department is divided into ROs so that people can be close to the core face. Water services are provincially ring fenced. Water resources management looks at catchment areas. Most of the Inkomati WMA is located in Mpumalanga province. Therefore, water resources are catchment bound. In the previous regime water resources were managed by circle offices. The ROs are not so different from the circle offices.

Water services authorities are Local municipalities in Mpumalanga province. Section 78 of the Water Services Act describes the process how a service provider is appointed. Ikangala water board in the High Veldt (Bronkorspruit) is currently being disestablished. Under the previous administration there were self-governing territories which were managing their own areas. However, DWA took over the areas under the new government system.

In the past, there was an independent government and self-governing territories. The Department of public works and water affairs was a central government department in the apartheid regime. In the new regime Water boards were established depending on the need of the community. Infrastructure was developed in Bushbuckridge and someone needed to manage it. So Bushbuckridge Water Boards was contracted. The Water Board should try and expand its operations to other areas. The initiative was taken by DWA but in consultation with the community members. In Nelspruit they did not have a service provider so Silulumanzi was contracted. But in the Free State Mining communities set up a Water Board to supply bulk water. There is Regional bulk and dedicated bulk water, the former is also providing for the other municipalities and the later is providing for just one municipality.

The process of establishing the Inkomati CMA started before the legislation was put in place (1997). Strong stakeholder involvement and active participation facilitated through adequate government financial support, coupled with enthusiasm by both DWA employees and catchment key stakeholders to have the

first CMA established played a vital role in establishing the CMA. When institutional realignment process was started to reduce the number of institutions reporting to the minister's office, the WMAs that did not start the process were stopped. In the Breede Overberg WMA stakeholders were really pushing and hence got established earlier in than the other four CMAs that were given priority status. There were probably some other stumbling blocks that hindered the CMA establishment process.

One striking similarity between the Inkomati WMA and Breede Overberg WMA is that they are both highly water stressed and hence could have established their CMAs on that basis. A combination of this and other factors could have seen the CMAs get established. The Olifants WMA also started to establish its CMA in 1998. The final mandate of the RO in Mpumalanga is now regulation and not operations.

Sizele Ndlovu (Former CEO-Inkomati CMA, former ANC local councillor)

He served, as the first CEO of Inkomati CMA as well as a member of the governing board. His interest in water resource management started when served as a member of the water services committee in Bushbuckridge community on a voluntary basis. He noted that there are also NGOs that work on the water resources side and not just in water service provision in the WMA.
Several tribal grouping are found in the WMA, for example in the eastern side of the WMA you find Shangani speaking people and in the western Suthu speaking people. Pockets of different tribes in the WMA are also found. Each of the different tribes wanted projects started in their respective communities. To avoid protests projects were started in communities simultaneously. There traditional leaders appointed community leaders to oversee the projects. Municipalities only started in 1995 but became fully functional in 2000.

The WMA had three Transitional Local Councils in Bushbuckridge from 1995 to 2000. They were then amalgamated to form the Bushbuckridge in 2000. The Traditional leaders were in charge of developmental issues in the area. There was a water crisis in Bushbuckridge and that is why Bushbuckridge Water Board was

set up since there was no municipality in the area. Civic organisations did have political recognition for chiefs. Civics did not have the capacity to deal with water resource issues. Before the 2000 chiefs had powers but lost those powers after 2000. Ward councilors became more forceful and took the powers of the Induna. A distinction needs to be made between civics and municipalities.

Inkomati CMA establishment period between May 2006 and May 2009 was in the transitional period. It had no staff at that time and literary no capacity to even deal with pollution issues and as such these issues were taken up DWA. Future of CMA is based on the relationship between commercial farmers and emerging farmers. When commercial farmers give up some of their water, municipalities should be able to utilize that water and not let it flow in Mozambique. The Inkomati CMA board is responsible managing the affairs of the Inkomati CMA and it is perceived that the board was not constituted by the best brains. English is the common denominator and as such it becomes difficult for those members who did not understand the language.

Authority of traditional leaders was that of tying people and when the civic organizations came in the powers were subdued. Homeland governments through the chiefs were able to handle water services issues in their areas. To some extent traditional leaders knew how to handle water issues. Government appointed committees amongst the different tribes in the WMA. Representation in provincial government is therefore proportionally based on the tribe dominant in the province.

Govender (Inkomati CMA Board Member, representative of power production, industry and mines, manager in Eskom)

Water is a critical input for electricity generation. Large volumes of water are needed for cooling. During the process of electricity generation 85-90% of water is lost through evaporation. Water for driving turbines should be clean so that it does not affect the machines. Water is also used to transport ash in the boilers and approximately 2% of the water resources are used for construction of facilities such as surface water dams, canal and pump stations. ESKOM has assurance of water supply since it is a strategic industry and is usually the last one to be cut off

in times of drought. There is a water station in the Olifants (330 m^3/annum) which supports four power stations. The Inkomati WMA supports the Olifants inter basin transfer scheme. ESKOM has not had any relationship with other stakeholders like commercial farmers.

Going forward ESKOM would like to participate by establishing requisite forums through the Inkomati CMA. It is seeking to have collective action with other water users to participate on WUAs in the Komati sub catchment. WUAs have not worked because it is done on a voluntary basis. Membership should be made compulsory in WUA in order for one to get a water licence instead of the current voluntary membership. ESKOM may not participate in all the sub basins in the Inkomati WMA but will actively participate in the Upper Komati where it has an interest. The two IBs that have been transformed are Upper Komati and Elands IBs. The Inkomati WMA is highly stressed while the Olifants WMA is highly polluted.

Strategic kind of planning skills, marketing and communication skills are needed among the stakeholders. Using customer centric kind of view in terms of who your users are, is key. The paradigm change about why the CMAs are important is necessary to understand. CMAs are just seen as government institutions but take a different form because they are taking the needs of the user into account. CMAs are seen as a creation of government and as such they are perceived as a wing of government. The end user is a customer and should get water at a certain level of assurance, quality and price. CMAs are aligned to DPSA policies in terms of remuneration at the moment but the governing board can find a leeway around this to enhance its capacity. CMAs can operate on principles of a private company. In the absence of a CMA, issues of water resource management are not being coordinated in a well focused manner.

The water tariff is determined using the bottom- up approach. In the past DWA determined the annual tariff by reflecting adjustments in the CPI. In the past DWA had no budget to base the tariff on but now the CMA has a budget, which it uses as a basis. Water boards are failing to deliver because they are not generating enough revenues. The new approach would work if the customer/users are

prepared to pay an increase in his tariff which will be based on what the CMA can deliver depending on the level of resources it has, capacity of resources, appropriate management skills and management of Governing Board since members come from different sectors. Depending on how you remunerate them you may get a wrong type of leadership coming to the board and may not add value to the CMA. Board members have to look out for the interest of the CMA even if they are coming different sectors. Balance of power in a board is in the voting rights of the members.

Composition of the development of the business plan is aligned to the Catchment Management Strategy. Stakeholders in the WMA have an input in the development of the CMS since they are consulted on the process. During the stakeholder meeting a business plan is put forward and ESKOM being about the major user (100,000,000 cubic) of water has the power to say what they want for the money they pay and demand that it is put in the business plan. What the CMA gives back to the water users is based on value for money.

The DWA does not have a strong engagement from the Central office with the CMA. The RO just supported the process of establishing the Inkomati CMA but the head office initiated the whole process. Relinquishing of powers by the DWA RO could have also contributed to the delay in the establishment of the Inkomati CMA. The DWA head office is where the institutional oversight office is located. Users in Inkomati WMA took the lead in the establishment process of the Inkomati CMA.

Before putting together the Governing Board, there has to be a buy in into the institution (CMA). For example a forty five million Rands business plan for the CMA has been developed, so you need people with broad skills on the Board. The Inkomati CMA board is a legal entity in terms of schedule 3A. DWA did not develop such plans, but since CMAs have a user concentric view/approach, they have to develop such plans. At the moment the RO cannot help users on issues of water quality.

Cornelius (Chairperson-Komati River Irrigation Board)

Land reforms (restitution) have been taking place in the region. This has resulted in joint ventures 'trusts' in the communities being developed. Some large farms like those under TSB were allowed to be sold off to Emerging farmers in the area that are using the water resources from the Maguga dam. The Inco-Maputo Agreement that was put in place as a way of encouraging farmers to use the water efficiently. Commercial farmers are perceived to use up more water than they are allocated. Initially emerging farmers were working unfairly with the sugar structures in the industry. There is the South African cane growers association, the sugar association and the South African millers association in the industry. There is a mill group board at every sugar mill with equal members of millers and growers. The mill is regulated by the Sugar Act and Agreement. Most of the small-scale farmers have 7.5Ha. They are required to have a quota from TSB. Some farmers are pumping water from the dams when they should not be and have not installed meters. Meters are supposed to be installed at the point where the farmer abstracts the water. The farmers (both commercial and small-scale) follow the 50 schedule, which implies that that they abstract 50hrs per week. Farmers have decided to come together to use one pump.

Commercial famers can take out some fields to carter for water availability during a water stress period, for example during the 2003/04 and 2005 drought period. It has been observed that the emerging farmers themselves sometimes bring about stress. Farmers have had to pay for the meters that were installed at the points of abstraction. Farming in the Nkomazi region is relatively new, it started around 1912 because of diseases that were prevalent in the area. At the moment there is a good relationship between IBs and Inkomati CMA. A proposal and proposed constitution was put forward to the minister about 5 years ago. It was rejected because they claimed that there was not enough public participation. Farmers do not have enough resources to setup meetings with all the people in the area, forestry and environment should have taken part in the meetings but did not participate fully. DWA assumed the responsibility of coordinating the process of organizing the meetings and appointed consultants to do that. Two meetings were held and the process was later stopped by the consultants.

They had two big problems that they had to deal with. DWA would like to see less number of WUAs as compared to the IBs currently existing. DWA would also want to deal with less number of people so it would like to combine areas. WUAs are voluntary organization and receive funds from their members to run the associations. Why should a farmer be in a WUA that costs him money? Under IBs farmers do not have a choice to adhere if they are irrigating in a controlled area, then they are required to contribute. If you have one big WUA, and there is a debt contracted by the WUA the members are jointly and severally responsible for that debt. Some farmers feel that they may not be liable to paying debts that they were no part of contracting. There should also be no power vacuum during the period when powers will be delegated from IBs to WUAs.

SALGA (Mpumalanga)

SALGA currently does not have full time councilors, there are only part time councilors in SALGA according the structure in South Africa. When developing water policies SALGA consults with DWA. Recently SALGA established a sanitation policy and DWA has worked with SALGA, though the department has moved to human settlement. Mpumalanga has 21 municipalities, 18 local Municipalities and 3 district Municipalities. The main objective of SALGA is to protect the interest of municipalities. Mbombela district municipality has a concession with Silulumanzi to provide water services instead of an irrigation board. Municipalities are supposed to be autonomous when making decisions. Silulumanzi was contracted about the same time when SALGA was being established and as such cannot respond effectively on this issue. At the beginning, some people felt that it was a wrong decision to contract Silulumanzi to reticulate water in Mbombela and other surrounding areas.

Bushbuckridge Water Board does not supply water consistently and the quality is also not good, this issue was raised in 2009. Bushbuckridge WB is about to change its name to Mbombela Water board since it also provides services beyond Bushbuckridge area. SALGA has been represented by a councilor who is a politician. The ANC recalled a councilor who was a SALGA representative on the Inkomati CMA governing board. The process that was followed was that SALGA

nominated three potential suitable candidates and the minister appointed from the three nominations provided. At the moment three names have been sent to the minister for appointment onto the new board. Currently the Inkomati CMA has not done much since it is new and they are receiving new delegations. Maybe from now on going forward we may see much being done by the Inkomati CMA.

There is no specific agenda that was given to the SALGA representative to discuss in the CMA governing board. Unless if there is a discussion that affects the functioning of the municipalities then the representative would guard against their functions being taken away or not being supported by other institutions. Municipalities are not protected by SALGA if they are on the wrong, they are advised by SALGA accordingly. SALGA believes that there is a water scarcity in the Inkomati WMA, some people have raised the concern of building new dams in the WMA. SALGA does not interact much with the traditional authorities, it is the municipalities that work with them.

Not many municipalities work with water boards in the area. Most municipalities extract and purify their own water. There are not a lot of conflicts between emerging farmers and commercial farmers even when water resources are scarce. Some people were confusing water resource management with water provision like residential. People were talking about water allocation when they were making reference to residential provision of water which Inkomati CMA does not deal with. Possible conflict could be between the commercial farmers and the water board and not municipalities or between commercial farmers and DWA. It's difficult to say whether IWRM is working well since the Inkomati CMA has just received the powers assigned to it in terms of schedule 3.

Bushbuckridge Water Board

The purpose of the Water board is to provide water to other institutions in line with the Act. The board also abstracts water, purify and distributes it to municipalities. The board is working in the Sabie-sand, Sabie and Crocodile sub-catchments. The Crocodile is in Mbombela municipality area and the others are in Bushbuckridge Local Municipality area of operation. The board is using dams like Inyaka and river

weirs. Inyaka dam is attached to only one plant for purification of water. Bushbuckridge Water Board operates on the same premise as the other Water Boards throughout the country, ring fenced by the Water Services Act. With promulgation of 1997 Water Services Act parliament has taken over water boards. The board is responsible for water quality of portable water and production must meet set standards. The Water Board has a board appointed by the minister. The appointment on to the board is a political appointment while at a technical level the CEO reports to the governing board of the Water Board. The board reports to parliament at administrative level report to the minister (DWA) and at the political level board reports to parliament.

The procedure for appointing a board follows with the Minister issuing a notice in the public newspaper media requesting for people to serve on the board on the various capacities advertised technical, finance. The CEO then establishes a panel to receive nominations which are screened and recommended to the minister for consideration on the basis of their qualifications. The two tier type of governance is what brings in the political appointments. When you look at the board then you are looking at the minister. Water deserves a political board since it is a political issue. The board may require the CEO or directors to become part of the board. The minister can appoint the CEO to the Board. Some people may be coming from the same political party but do not represent the same views in the very same organization.

The municipality has more powers and the Water Board is reliant on the municipality for payments. Councilors consider themselves much more legitimate than those people (councilors) who are appointed to the board by the minister. The minister appoints someone who is close to the network. The Minister is expected to appoint people based on the skills they possess and not the political party they are coming from. We do not expect politics to jeopardize water service delivery. The Water Board did not have a good relationship with the two municipalities they are servicing because they did not enter into a service level agreement. This has not happened to date because they were not able to agree on a number of issues particularly at a political level. There has also been no agreement on payments. It is not the ability to pay since municipalities receive national grants. The issue of

willingness to pay needs to be addressed. They are not willing to pay because they are not on the same footing politically. Municipalities owing certain Water Boards wanted the minister to disestablish water boards that were being owed.

Schemes in Bushbuckridge area are going down. People who are appointed to the board know one another even before they are appointed to the board since the area they are coming from is a small one and the chances of knowing each other are always high. Bushbuckridge Local Municipality has always claimed that Inyaka dam is supposed to service their area. They do not want the Water Board to put a pipeline that will take water to Mbombela because they say that it is their water. There is also a reluctance to put pumps to service the areas where there is high demand for water. The Water Board pumps between 60 to 65 mega litres per day and have eight plants. The Inkomati CMA was created to regulate Water Boards. Water Boards apply for water permits from the Inkomati CMA. DWA has no capacity to perform catchment management issues hence has created the Inkomati CMA.

Bushbuckridge Municipality (staff, Operational & Maintenance Manager)

DWA had no presence in the homelands, the department only had its presence at the national government level. In the homeland (former Gazamkulu government) water supply was a section under department of works. After 1994 the DWA was centralized in all the homelands. Every homeland had its own setup in terms of water supply and sewerage treatment plants. In others it was under the department of Agriculture and in others it was under health. Water service has not gotten worse in the WMA. But there is a lot of theft of cables, motors, illegal connections and vandalism. Capacity of water was designed for the standard delivery (RDP). People are connecting illegally hence creating water scarcity in the area. Inyaka dam has not yet covered the entire area this is because the pipes that were laid from Inyaka dam to Akhornoek failed to pump water when they were being tested. DWA has not yet attended to this issue yet.

Funds to develop infrastructure from government were not enough and the funds have now been transferred to the municipality project manager. It has taken

almost 15yrs to connect the dam to the community. Municipality has eight water plants that they take care off. Bushbuckridge Water Board sometimes does not provide sufficient water due to certain challenges. However, the breakdowns are not frequent. There is not much dissatisfaction from community members over water service provision. Sometimes it is the community members themselves that create the water shortage problems through vandalism and illegal connection. A flow meter is put at the main plant to see how much is going into the system. Water meters are also put at households for the purpose of cost recovery for the service delivery. There is enough raw water in the system. The catchment has about five rivers flowing non seasonal. The Inkomati CMA interacts more with the director and water services manager.

Mr. Nkosi (Traditional Leader)

The traditional institution is the oldest form of government in South Africa. In 1996 it was enacted in parliament. Each house of chiefs has a composition of 5 to 10 people. There are two Ndebele kings and sixty seven traditional leaders in the province. The Mpakeni traditional council is the chairperson of the local house. Chapters 5-7 in the South African constitution do not provide sufficient detail on the role of traditional leaders in the country. Initially there were 13 Kingdoms in South Africa but the number has been reduced to seven.

Mbombela municipality has eight wards over seen by the councilors. The councilors disregard environmental issues in most cases. Mbombela municipality has contracted Silulumanzi a private company to handle water reticulation in Mbombela and some outlying areas. The Nkosi was of the view that the councils should handle water reticulation issues. Silulumanzi is therefore playing the role of a water board in Mbombela. The Nkosi was also concerned about DWA not giving water licences' to allow water to flow from Nyaka dam to the Bushbuckridge community.

Mr. Mokoena (Civic)

The civic was used to support ANC during the apartheid struggle when the ANC was banned. The civic and the ANC have continued to work as an alliance. The civic works as the eyes and the ears of the community. In 1991, the civic was given a mandate not to recognize the traditional leaders. Whereas the municipality is supplying water using water tanks in the rural areas where there is no piped water. Water scarcity and access to electricity and roads constitute major problems in Bushbuckridge. The civic leader also reiterated the issue of failure to lay pipes from Nyaka dam. Hence, water in Bushbuckridge is not being easily accessed due to poor planning by DWA.

Consultants that have been hired to undertake water resource management issues have often not delivered to the expectations of the community. The relationship with the Inkomati CMA and the Water Board is considered good. Break downs of water tanks forces people to use buckets to draw water. It was however, noted that emerging farmers that are located near the agricultural scheme in Dinglidale have enough water for their activities.

Ms Rose, Ms Cynthia Zeran & Mr. Nelson Muripa (Emerging Farmers) Dinglidale

Dinglidale Irrigation Scheme is an initiative that was started by government from Pretoria around 1964. The scheme has about 955 Ha, with each farmer cultivating 1Ha. There is not enough to support farmers on the irrigation scheme due to an increase in the population. The irrigation scheme has been lacking maintenance and hence government is now encouraging farmers to contribute towards maintenance of the scheme as a way of self-dependency and ownership of the scheme. Despite the scheme being in a poor state, the emerging farmers noted that there are no conflicts with White commercial farmers over water resources because they (Emerging farmers) receive sufficient water for their irrigation activities. The main crops that are grown on the scheme include maize, cabbages, spinach and Jacko beans. There are however, thin markets for these products in

the area. Farmers do not have contracts with buyers. There is a lack of coordination and organisation among farmers.
The Inkomati CMA is planning to install a meter on the main canal as a way of monitoring and accounting for the water that is abstracted from the dam. Farmers have a problem with this idea because the scheme is not being managed collectively at the moment. The municipality is responsible for settling bills for the water that is used farmers in the scheme.

The community is currently receiving 20lts of water per household from the council. The driver of the water truck sometimes decides how much water each household gets. The communities are supposed to have Jojos' for storing water but they are stolen by some people from neighbouring villages. The community members also draw water for drinking from the scheme to supplement what they receive from the council. However, they note that the water is not of good quality.

Reuben Leyane (Emerging Farmer) HazeyView

A teacher by profession and went into farming in 1993. He currently cultivates between 2 to 3 Ha of the 20Ha of his land. He grows maize, butternuts and tomatoes. He notes that water billing is a problem since it is a new thing. Water is from the canal that is managed by Sabie-river irrigation board. The association has about 100 farmer members. There are three different phases with approximately 40 farmers in phase 3a, 30 farmers in phase II and another 30 farmers in phase I. There is not much conflict in the Sabie river catchment. The billing of the water used by emerging farmer who are members of the association is currently being done by DWA. It is political thing to transform from irrigation bards to WUA since some white farmers think emerging farmers will out vote them. The two characteristics of emerging farmers are illiterate and semi-literate.

Andre Van Tonder (SAPPI)

Forestry is one of the biggest threats to water resources scarcity in South Africa. Sappi craft and forestry are among the major water users in the Inkomati WMA. General water users in the WMA do not recognize WUAs. WUAs cannot police water use without the right tools, functioning of WUAs has not been thought through properly. WUAs need the expertise of technical people to appraise projects up-stream such as mining projects.

Elands Valley Irrigation Board has been transformed into Elands River Catchment Water User Association (ERCWUA). The WUA has 12 member groups and the biggest risk to the association is that people do not care about why they should be in the WUA. This is because DWA was not very clear on the functions that it wanted WUAs to perform when they were being proposed to be established. He wondered why a structure that is already strong should be destabilized making reference to IBs in order to form one that is shaky (WUA). It is difficult to get people to start working together in a country which has a history of racism. It is the interest of commercial farmers to assist emerging farmers to succeed. This will eventually result in political stability since government is not able to work at this lower level hence the need for WUAs.

There is 250,000Ha of land of which 70% is planted with commercial plantations and 30% is still natural. A tariff is paid to DWA and is charged per ha of trees. Comparatively commercial sugar plantations consume a lot more water compared to forestry. Government owned forests are the largest in Mpumalanga province compared to the privately owned forests. Mondi is the second largest followed by Sappi. The Inkomati CMA has some international obligations, it is responsible for the flow of water to Mozambique and Swaziland. There is need to build a state of the art dam in the Inkomati WMA which will minimum negative ecological impacts. There is no good water resource management in local municipalities at the moment in Mpumalanga. It will be better to adapt IBs and not transform them into WUA since they have strong structures on the ground. A water pipeline has also been laid from the lower crocodile to White river town.

Clemeus Kiessig (Barberton Mines)

Mining is a relatively small sector in the WMA and Barberton is the biggest mine in the area. The mine has been in existence for the past 126 years. The mine pumps out water in underground mining and the water goes to the process of milling. Slime water is pumped to the tutelage facility. Some of the water is lost through seepage and evaporation. There is also a bios plant where gold is processed using bio-technology. Cyanide is isolated through the biological process. Excess water is discharge from underground to strike a balance. The mine has applied to DWA for a water licence but there has been no feedback yet.

The mine abstracts water from the river for use in treatment plants. The mine is charged for discharging waste water back into the main stream waters. The water discharge licence will come into effect in 2012. However, it is not know with certainty whether the revenue collected from waste water discharge will be used for improving water quality by either DWA or the Inkomati CMA. Flow meters are installed for the water abstracted from underground. The mine is not aware of what the new water tariff will be when it is effected by DWA. DWA is expected to charge based on the quantity that is consumed. DWA will soon start issuing the water licences.

There will be need for the community to have expertise in order for the Inkomati CMA to carry out work that is currently being carried out by the DWA. The Inkomati CMA is much more familiar with the activities of farming communities rather than with the mining sector. Mr. Kiessig was also concerned with the structure of the Inkomati CMA, he said that the organisation was not going to take the route that ESKOM took, were employees will just be receiving a salary. In the past there was confusion as to whom water users could apply to in order for them to get water licences. It is an ethical thing to be part of the Inkomati CMA. The mine is also part of the CROC committee because of the pollution (high acidic levels in water) that results from the mining activities.

P.G Du Toit (Ehlanzeni District Municipality)

Functions of the water authorities changed in 2003. Four Local Municipalities (Mbombela, Nkomazi, Bushbuckridge and Barberton) are responsible for water services delivery themselves. The District Municipality is responsible for monitoring the activities of the Local Municipalities. The Local Municipalities have cut down on operational maintenance due to financial constraints. For example, refurbishment of water treatment plants and refurbishment of wastewater treatment plants has stalled. While in Komatipoort water works will be completed in March 2011. The District Municipality is highly concerned about the state of infrastructure in Komatipoort and Bronskspruit Municipality areas.

The District Municipality is not responsible for bulk water management. The District Municipality is equally not concerned with the availability of water resources in the rivers. At the moment the District Municipality is not working with the Inkomati CMA. The two organisations only meet at water sector meetings where all stakeholders in the sector meet and where several issues are discussed such as complaints and how to resolve standoffs. Silulumanzi -a private company- was appointed by Mbombela Local Municipality to provide water services. Bushbuckridge Water Board was established by DWA and Bushbuckridge is the only Municipality area that has a Water Board. There is a proposal of changing the name of the Water Board to “Mpumalanga Water Board” since it serves more than just Bushbuckridge area. Mpumalanga province is the only province with District Municipalities which do not have the functions of water supply to communities.

The Ehlanzeni District Municipality and the Inkomati CMA meet but do not have a close working relationship which also applies to Bushbuckridge Water Board. Most members in the village communities are not paying for water they receive and it has now become a political issue. As a result the funds that are collected from those that are willing to pay are not enough. Hence, the cost recovery is low by municipalities. It is not known who is paying for the water (60 liters) government is providing to the people in the villages. The culture to pay for water by consumers in villages should be encouraged. The problem was long created by historical trajectories. At the moment tribal authorities do not have powers as much as local

authorities. Councilors are responsible for water related issues, as such issues of water are politicized by councilors. Councilors do not talk about cost recovery because they do not want to become unpopular with the people they serve. Nkomazi and Tonga people do not pay for water services even if they have connected to their houses illegally. This phenomenon is contributing to the collapsing of municipalities since they are not able to raise enough funds for maintenance.

There is also a shortfall of skilled man-power in the municipalities. For example, Mpumalanga area only has two engineers in the entire municipality. Nkomazi has no engineers in place and this is bad for the institution. There is a lack of skills transfer in the organisations. The focus is on the uplifting of peoples standards of living in rural areas and not on infrastructure development. It is now becoming costly to bring back the infrastructure to usable standards in these areas. In addition to the above, the following were identified as key challenges in municipalities: Political interference and low motivation among municipality workers to maintain infrastructure. If water is not paid for, there is an element of using excess water, which results in people experiencing shortages. Shortages are also as result of people using tap water to irrigate their gardens. There is need to put valves on the water reticulation system to control the amount of water that flows to villages. Currently water is being pumped twenty four hour to the villages.

Municipalities are now being controlled by councilors who may not be knowledgeable on water issues. Teachers who are not technical people dominate the Member of Mayor Committee (MMC). From the mayor to the municipality there is a lot of interference. Municipal managers may not be right for the job since the ruling party politically appoints them. The Mayor has political powers while the Municipal Manager has administrative powers. There is usually a conflict between the two offices, which affects the morale of the municipality. Therefore, if the mayor is too strong then indirectly politicians are ruling you. In such a case the Premier intervenes and not the District Municipality.

Yolanda Oosthulzen (Silulumanzi/Sembcorp)

Silulumanzi is a private company contracted by Mbombela Municipality to reticulate water in Nelspruit and some other areas in the WMA. The company ensures that water leaks are minimized in its areas of operation. The company also sees to it that quality effluent is put back in the water streams. It also monitors the levels of phosphate in the areas of operation. There are stringent limitations on phosphate using a special standard on phosphate. Nkomazi has a big water shortage which Silulumanzi services with water that it receives from Bushbuckridge Water Board. The integral part is to get companies to manage the water treatment plants instead of the Water Board in some areas. There are a lot of illegal connections in areas where the company operates, and workers receive death threats if they try to disconnect the illegal connections. The company holds meetings regularly with councilors and water committee members.

Water quality is compromised in areas where the company does not have treatment plants. The company has good water quality in the plants it operates/maintains. The infrastructure, which the company uses and maintains, belongs to Mbombela Municipality. Farmers take care of the canals which pass through their land. The coming of the Inkomati CMA will improve water management in WMA, since DWA currently has no capacity in most areas to perform water management issues. It is also important that when something changes, to give time for people to get used to the new system. It is thus envisaged that, if the communication between the Inkomati CMA and the company will be good, then no serious problems will be expected to arise. The company is also part of the CROC committee that discusses issues of water shortages, the reserve amount, ensuring that there is sufficient water going to Mozambique and water quality in the Crocodile river. Nelspruit water recovery is good while in Nsikazi area the recovery rate is still very low. Some villages where there are no RDP taps, people get water from municipal tanks (Jojos) which is given to them for free. There is also political interference in Nsikazi area because it is a sensitive area. Some people are both stakeholders in the Water Board and at the same time are government workers.

Van Rooy (TSB Sugar - Komati Mill in Malelane)

TSB Sugar company is owned by Raingrow which is listed on the stock exchange as a private company. The company promotes the establishment of cooperatives that are service oriented such as the provision of fertilizers. It supports different project in its areas of operation. The company has 10,000 ha under projects for farmer associations. The small-scale farmers'' project is 300 ha with an average size of 7 ha per farmer. There is also a land transfer beneficiary's project, which supports middle- scale farmers under a share block arrangement with an average size of 75 ha per plot. There is also a straight lease project which is meant for commercial growers, it is a 10-15 years lease. The joint venture model is where TSB and a trust form a company. Fifty percent of cane supply comes from black growers in the project areas.

The small-scale growers tend to have problems hence the cooperative model seems to be popular among small-scale growers. The Joint venture model is best for profit and flow of benefits to the community. The department of Agriculture, which also supports small-scale growers, is a partner of the South African Sugar Association (SASA). TSB thought that if it was not going to be successful with the land reform process. Had it not been successful with the land reform process then the company would fallen as well. The company felt that, it could not have stood on the sidelines and watch the reform process unfold without participating in it. It was important for the land reform process to be handled well since there is a high population in rural areas compared to urban areas in the WMA. Komati Irrigation Board was the first IB to have fifty percent representation of black people on the board. The IB was established in the early nineties while the Komati Mill in Malelane was built in 1993/4. The basic recipe is having joint objectives and interests of stakeholders. TSB is concerned with water management and the land reform process.

The strategic plan was made by TSB to bring emerging farmers in the interest of the business. The land reform process should be linked to water resource management. The former government had funded a lot of projects in the former homelands in South Africa. From the 10,000 ha meant for the redistribution project

in former homelands, 2% of commercial land has been used for redistribution and 30% for restitution. The Irrigation Boards are responsible for supplying water to emerging farmers in the Komati and Crocodile sub-basins. Any development project in the WMA is linked to water availability. The Maguga and Driekoppies dams were built to support development projects in the WMA. However, the new policies of the current government are not functioning well. At the moment sugar is acting as the glue in the area between the black communities and white commercial farmers. There are about 1200-1300 small-scale cane growers in the area.

Irrigation Boards are ready to transform into Water User Associations and have submitted their proposals for this process. However, the government is delaying the transformation process, yet it is calling for decentralisation. For example, the tribal authority is not a water user, but the municipality is a water use. Politics should not be brought in to manage the water resources in the WMA. KOBWA is doing the high-level management of water resources using a similar model that has been set up in the Crocodile sub- basin. KOBWA is a joint process between South Africa, Swaziland and Mozambique, which implements the operational rules. IBs in the past had to go through DWA to access water from the dams. With more information being made available using the models, you are able to make efficient decisions. There is a shortage of water in the crocodile sub-basin thus the reason for setting up the model by the Inkomati CMA.

The Inkomati CMA was ready to assume higher responsibilities a long time ago but DWA did not give it the powers thus stakeholders were frustrated by the government's decision. The CEO for the Inkomati CMA should not be a person with political inclinations, the CMA needs the right leadership. Twenty percent of the board members may only be the ones knowledgeable about water resource issues in the WMA. Even if you have a good board but poor management, you will get poor results at the end. It should not just be about politics. The Inkomati CMA management should give direction to the board. The board should have more experts and the management team should perform. Consultants have not performed as expected and as a result it may have contributed to the slow process in the establishment of the CMAs in South Africa.

Lilian Masilela (Board Member-ICMA/NGO)

She has been a Governing Board member of the Inkomati CMA since 2005. Her term as well as other board members is over but the minister has been extending the tenure of the members. She was selected to represent the NGOs in the WMA since she has a good understanding of the NGOs working in the WMA. She recently moved to join a private company (Silulumanzi) and yet she is still representing the interest of the NGOs on the Governing Board. The company is responsible for water abstraction and reticulation as well as sewer treatment, a function that should be carried out by the municipality. Since Mbombela municipality did not have the capacity they decided to award the contract to Silulumanzi. It is similar to Bushbuckridge Water Boards except that the Water Board is responsible for bulk water management. The Water Board also supplies water to the company is some areas. The company has been awarded a long contract of about 30 years to supply water in Mbombela and the outlying areas. This has caused some conflicts between Bushbuckridge Water Board and the company. The water Board was the only institution given the water authority status by the Minister, but along the way Mbombela municipality also received the water authority status to start supplying water. The decision to grant rights to Mbombela municipality to supply water was political. People in rural areas do not want to pay for water that they receive. In the past they used to receive water on alternative days through the communal taps, but Silulumansi has upgraded the supply of water and are now receiving water 24hrs. The company has also installed meters and people are no longer using communal taps, each house receives water but the residents do not want to pay for it because they are used to the old system. Silulumanzi collects the tariffs on behalf of Mbombela which it then passes on to the municipality and receives its profit for the services it provides. The DWA does not receive a tariff from domestic users but from farmers, industries and the municipality.

The first Governing Board of the Inkomati CMA was much more focused on the establishment of the CMA and business strategy plan development as well as the Catchment Management Strategy (CMS). The second board will be more focused on undertaking the functions and issues from the different sectors. The second

board is likely to be appointed based on the special skills of the nominees. At present, there
is no representative from SALGA in the board, implying that their sector issues are not being discussed on the board. There is also no desk for the private sector in the current board. The NGO sector is not well organized as SALGA, which has a structure and accountability. In the NGO sector there is no umbrella body that NGOs are accountable to. Silulumanzi has not taken advantage of her position on the board to discuss some issues that affect the company. The company does not see the relevance of the existence of the Inkomati CMA. The board has not discussed issues of water redistribution yet, thus there are no major issues of conflicts between water users that have been brought to the attention of the board. There are some board members on the Inkomati board that are more vocal than others because they have previously served on big boards. There are also people who are authoritative/dominating on the board and just want their opinions to be taken by other members. Some people are vocal outside the board because they want to check if they understand what was being discussed, as way of understanding the technical issues. For continuity purposes some members serving on the current board may be re-nominated to serve on the second board. The current board has extended its stay in office for more than two years since its term came to an end. The CEO of the Inkomati CMA has also been acting for quite some time now, recently the board appointed someone new to act as the CEO.