WATER GOVERNANCE DECENTRALIZATION IN AFRICA: A FRAMEWORK FOR REFORM PROCESS AND PERFORMANCE ANALYSIS

Report to the
Water Research Commission

by

R Hassan[1], A Mtsweni[2], M Wilkinson[3], D Weston[2], J Mutundo[4], T Magagula[3], Pinimidzai Sithole[2], S Farolfi[5], A Dinar[6]

[1]Centre for Environmental Economics and Policy in Africa (CEEPA), University of Pretoria
[2] Pegasys, Pretoria
[3] Prime Africa Consultants, Pretoria
[4] International Centre for Water Economics and Governance (IWEGA), Edwardo Mondlane University, Maputo
[5] Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement, (CIRAD), Montpellier
[6] Water Science and Policy Centre, University of California

WRC Report No. 1969/1/14
ISBN 978-1-4312-0583-7

July 2014

Obtainable from

Water Research Commission
Private Bag X03
Gezina, 0031
South Africa

orders@wrc.org.za or download from www.wrc.org.za

EXECUTIVE SUMMARY

For long time water resources have been managed in a centralized manner where delivery of the full range of water resource management (WRM) activities was usually provided by national governments. Many problems have been associated with the centralized management approach. Inequality in access to water, limited financial and technical capacity at national and basin levels, poor infrastructure and service delivery, declining quality of river basin natural resources, limited stakeholders involvement in decision making, institutional fragmentation, uncoordinated sector policies, and increasing number of conflicts among stakeholders are examples of such problems (Easter and Heame, 1993; Swatuk, 2005).

Decentralization of water management and governance through integrated water resources management (IWRM) approaches has been proposed as the appropriate framework to deal with such problems. This was endorsed by many international initiatives and conventions placing IWRM at the top of the international agenda as key requirement for achieving sustainable development (UNCED, 1992; Rahaman and Varis, 2005; GWP, 2000). Since then IWRM witnessed worldwide adoption and many African countries introduced various reforms in their water laws, policies and related regulations and institutions to facilitate implementation key elements of IWRM (Van der Zaag, 2005; GWP, 2000). SADC countries, for example have adopted comprehensive institutional reforms in the water sector towards decentralization of water management (Magaia, 2009; Backeberg, 2005; Karar, 2002; Wester, 2003; Manzungu and Kujinga, 2002). However, the impact of these reforms on river basin decentralization process and its performance is still largely unknown. Very different stages of advancement have been observed in various African river basins indicating the difficulty of implementing decentralization in practice. It therefore seems necessary to understand why some water agencies have succeeded more than others, what are the variables involved in such reform process, which variables have a positive or a negative impact on the implementation of decentralization processes in the African water sector, and which variables could be affected by policy interventions and how.

This study made an attempt to address the above questions using an analytical framework that captures important political, institutional, hydrological, cultural and historical as well as socio-economic factors likely to influence performance of water management and governance decentralization reforms in Africa. The study purpose was to enable water sector decision-makers identify and properly address hurdles hampering a transfer of water management actions to the lowest appropriate level within river basins. A number of social, economic, human health and environmental benefits are expected from carrying the study. The project adapted to the African context the analytical framework of Kemper

et al. (2006), Dinar et al. (2007), and Blomquist et al. (2008), who developed and implemented a methodology that permits both in depth case study analyses (Kemper et al., 2006; Blomquist et al., 2008) and quantitative estimates from a global set of river basins attempting decentralization (Dinar et al., 2007). The framework identifies and focuses primarily upon four sets of potentially observable variables (physical, financial, economic and equity indicators), and suggests hypotheses about the paths by which those variables are associated with the likelihood of successful or unsuccessful decentralization of river basin management.

The chosen analytical framework was implemented in two phases. In the first phase the case study approach of Blomquist et al. (2008) was modified and applied to a sample of basin organizations across the SADC region, representing various physical, economic and political situations. Decentralization reforms attempted in one river basin in SA (Inkomati), one river basin in Mozambique (Ara Sul) and one river basin in Zimbabwe (Umzingwane) have been evaluated in the first phase of the study. These catchments, all situated in the SADC region, were chosen because they have all been exposed to a certain degree of institutional decentralization (establishment of CMAs, creation of basin authorities, WUAs, etc.). However, the case study analyses only highlight the direction in decentralization but do not allow systematic quantitative analysis of generic reasons and forces behind the decentralization process and its performance. A quantitative analysis of decentralization of basins across Africa was planned to take place in the second phase of the study. The two phase approach was thought to enable careful modification of the set of variables used in the econometric study of Dinar et al. (2007) by adjusting the questionnaire used to carry that study to conditions prevailing in the Africa region.

This design and study plan was also chosen to provide a direct link and facilitate valuable complementarities between two research initiatives supported by a number of collaborating institutions over an overlapping time frame. The first was an initiative supported by the WRC, under the Institutional Governance and Reforms Program of its Water Resource Institutional Arrangements Thrust to carry sub-regional analysis on the progress and performance of experiences in implementing decentralization of water management in southern Africa in collaboration with IWEGA and CEEPA. This was coupled with another parallel initiative supported by the WSPC of the University of California Riverside in collaboration with IWEGA and funding from the World Bank to carry similar investigation at continental level in Africa. Original plans and analytical approaches of the sub-regional analyses have been modified as implementation of study progressed for a number of reasons explained in subsequent sections.

The regional case study analyses showed that attempts to decentralize management of the Inkomati, Mzingwane and Limpopo river basins in SA, Zimbabwe and Mozambique, respectively have been supported by ratifications of water laws leading to creation of

river basin level institutions (organizations and other mechanisms) to manage basin resources. Examples of local level organizations included the Inkomati CMA in SA, the Zimbabwe National Water Authority in the Mzingwane river basin and the Limpopo River Basin Management Unit in Mozambique. Establishment of systems for information sharing among stakeholders, commonly performed using basin meetings is one example of mechanisms which facilitate the management of river basin management. However, none of the studied river basins can be considered fully decentralized and the decentralization processes varied among the three case study basins. The Inkomati in SA was found to be more decentralized compared to Mzingwane in Zimbabwe and Limpopo basin in Mozambique where the process appears lagging behind. Variations in key institutional factors seem to be the reason behind these differences. The positive outcomes of the Inkomati river basin decentralization process are linked to the type of devolution (mutually desired process) followed, which resulted in larger involvement of local stakeholders, compared to the weak involvement of river basin stakeholders in Mzingwane and Limpopo due to the top down devolution approach followed.

Similar to the decentralization process, results of the evaluation of performance of the decentralization initiatives in the three river basins are mixed. Although RBOs in the three countries do not have financial management autonomy, the Inkomati shows the best performance, followed by Mzingwane, which seems to outperform the Limpopo river basin. Participation of stakeholders in the management of river basin resources has been a crucial factor determining these differences. While governments (e.g. policies and laws) of the studied river basins have shown high willingness and commitment to decentralized river basin management, concentration of power seems to be the key factor that negatively impacted the performance of the studied river basins. It is also important to highlight the fact that decentralization reforms require sufficient time to evolve successfully and therefore governments should be prepared to sustain their commitment to decentralization reforms for many years to come to achieve successful decentralization of WRM.

A number of shortcomings however, limit the robustness of the results of this study. First, the analysis is based on only three data points representing the composite responses of interviewed key informants in the three case study river basins. This did not allow implementation of the proposed empirical model, which requires estimation of a much larger number of parameters, which will be achieved by a continental study to follow, that will survey sufficient number of river basins in SSA. Second, testing of the original questionnaire designed for implementing the proposed institutional economics analytical framework suggested few necessary modifications to be made before conducting the bigger continental study. However, the WRC Project Reference Group (WRC-RG) thought that the intended continental survey and analysis will be of high relevance and policy value for higher levels of management at river basin level but will not provide

enough information for assessing progress and performance of decentralization reforms and experiences at regional and national levels in the southern Africa context and has accordingly decided to extend the regional analysis of Phase I of the project to address its current shortcomings.

The main objective of the expanded study in Phase one of the project is to conduct further analysis investigating progress and performance of decentralization of water management reforms in the region applying an adapted version of the above tested institutional economics analytical approach, methodology and questionnaire suited for the SADC regional and national contexts and experiences in implementing IWRM. The survey has been consequently rerun with the adapted questionnaire in the three countries sharing the komati river basin (IRB), namely SA, Swaziland and Mozambique. The IRB was chosen because it has international, national and local dimensions of WRM, institutions have been established within the various states sharing the river basin, and there is a broad policy alignment in terms of intent toward implementing IWRM.

The water resources of the IRB are shared between three basin states each of them has strategic social and economic development drivers that depend on the availability and equitable use of the water resources of the river. Mozambique for example is faced with continued growth of the Maputo region and the subsequent increase in demand for water for irrigation, hydropower generation and water supply and sanitation. SA also relies heavily on the IRB to meet its large scale commercial agriculture, forestry, industry and hydropower generation, as well as mining activities. Similarly, Swaziland relies on the same water resources and its strategic drivers include tourism, industry, forestry, and agriculture to meet its social and economic development needs. However, it must also be noted that any water resource development planned and implemented by SA and Swaziland have a direct impact on the amount of water flowing into Mozambique.

Meeting the above strategic development needs clearly puts a lot of stress on the Inkomati water resources and requires that the three states harness water flows wisely to cater for these demands. To this effect, various bilateral and trilateral agreements have been put in place to facilitate the sharing of the water resources of the IRB. Some of the agreements have resulted in trans-boundary bilateral and tripartite committees and RBOs. Examples of these trans-boundary structures (committees and organisations) include water (basin) infrastructure authorities such as the Komati Basin Water Authority established under a treaty between SA and Swaziland to develop, finance and/or operate joint water resources institutions (WRIs) between the two countries. Multi-lateral basin committees such as the tripartite technical committee (TPTC) have also been established to advise the parties on a range of trans-boundary water management issues and priorities, including the development of a basin agreement/plan concerning the allocation of water, trans-boundary objectives and institutions to be established to foster cooperation in the basin.

In addition to the trans-boundary structures, each of the three countries also has specific water laws that guide water governance and management at a country level. These laws follow an IWRM approach and are aligned to the SADC regional water policy, the SADC Protocol on the management of trans-boundary water resources and other regional and international laws developed to coordinate systematic development and management of water resources. Within each country these water laws guide the decentralisation process and give effect to the establishment of institutions to facilitate IWRM. While progress has been made to establish these WMIs, preliminary research indicated that this process continues to face several challenges, including:

- Weak political support and appetite for change.
- Major financial constraints
- Complexities associated with joint planning, coordination and monitoring, including information management and reporting on the state of the water resources
- Institutional arrangements and duplication of roles between the new institutions and the departments that have been responsible for the implementation of WRM in the basin.
- Human resource capacity constraints including skills to guide the decentralisation process
- Trans-boundary management aspects, especially conflicting priorities among states and the need to meet strategic social and economic developments needs in the three countries
- Stakeholder engagement and communication, in particular the need for extensive engagement and empowerment of water users, a process that requires significant financial resources to accomplish.

The most important challenge is the slow pace of the decentralisation process in the three basin states despite clearly defined water laws. There is certainly a need for more research work to verify and confirm the above identified preliminary challenges and propose options to improve the situation.

The GWP-SA Report on the progress of IWRM implementation processes uses a set of indicators based on the GWP Toolkit. A methodology framed in line with indicators developed by the GWP has been developed for testing and use in this study with some elements adapted from the Cap-Net approach. The proposed approach and indicators were chosen because they are based on aspects of water governance and IWRM, and perhaps more importantly is that, these indicators have already been tested in a number of RBOs in the SADC region. Since the countries targeted for conducting the performance assessment intended here form part of the SADC, it makes sense to apply an approach similar to the regional one adapted to suit existing case study RBOs to explore further the

extent to which progress has been made in these countries toward implementing the decentralisation process.

The selected indicators are divided into 4 main themes each with one or more indicators capturing elements that describe the enabling framework, the management instruments, and the operational instruments. These can be seen at different scales with the enabling framework being more national in nature, the management instruments touching national and regional scales, whilst the operational instruments encompassing both regional and local levels. The enabling framework constitutes the first category of indicators that aim at assessing the policy, legal and institutional environment within which RBOs operate to determine the extent to which it is conducive to achieving IWRM objectives. The second category of indicators captures performance assessment elements under management instruments, which include water use efficiency, infrastructure management, stakeholders' engagement and financing. The third category covers operational instruments with performance elements ranging from planning and monitoring, functional and institutional coordination, and legislation to enforcement and compliance. To collect information needed for construction of the proposed indicators guiding examples of types of questions to be included under each were provided.

The study revealed that the IWRM enabling environment is largely in place in all three countries in the basin, which represents a significant development as the policy and legislative environment is the most crucial for successful implementation. Currently, the financial enabling environment is the only weakness, with the mechanisms to ensure WMIs becoming self-sustaining still being developed or only partially implemented. The study further showed that decentralization has included RBOs in the SA and Mozambique portions of the IRB, but not all the authority and power for decision-making has been transferred to lower level organizations (e.g. WUAs). The central government is still playing a significant role in providing financial resources to sustain lower level institutions and it was further reported that some of the decisions made by these institutions are been delayed by the central government. For decentralisation to succeed and become sustainable, WMIs in the basin need to achieve stronger state of independence. Results of our analysis suggest that Mozambique has started to demonstrate the first success in this respect.

Change areas within the IWRM institutional framework criteria demonstrate varied levels of success. Institutional structures, roles and responsibility have successfully been articulated in policy and legislation in the basin. Implementation of these policy and legislative IWRM imperatives however remains a challenge. Only some of the decentralised water institutions have been established and are functioning at various levels of success. Stakeholder participation does seem to be one key factor behind successes of the institutional framework in the IRB. Greater attention will need to be paid to capacity building in future.

The IWRM management instruments are perhaps the least developed change areas of the IRB case study. This is to be expected as management instruments are effectively the implementation tools for IWRM. With the implementation of IWRM and decentralisation of water management still relatively new in the IRB, one would expect that these management instruments will develop as the IWRM process progresses. However the current conflict resolution mechanisms should be noted, as should the initial regulatory instruments. Much work is still ahead however, particularly within these criteria for IWRM.

ACKNOWLEDGEMENTS

WRC Research Management Team

Eiman Karar	Director, Water Resources Management, WRC
Penny Jaca	Proposal and Project Coordinator, WRC

Reference Group

Mrs E Bofilatos	Department of Water Affairs
Dr MC Dent	University of KwaZulu-Natal
Mr Marcus Selepe	Inkomati CMA
Mr Derick Du Toit	AWARD
Dr Dirk Roux	SANParks
Dr J Goldin	University of the Western Cape
Prof Kevin Rogers	University of the Witwatersrand
Dr Stuart-Hill	University of KwaZulu-Natal
Ms Barbara Schreiner	Pegasys

Research Team

Rashid Hassan	Centre for Environmental Economics and Policy in Africa (CEEPA), University of Pretoria
Amos Mtsweni	Pegasys Consulting, Pretoria
Derek Weston	Pegasys Consulting, Pretoria
Pinimidzai Sithole	Pegasys Consulting, Pretoria
Joao Mutundo	International Centre for Water Economics and Governance (IWEGA), Edwardo Mondlane University, Maputo
Melanie Wilkinson	Prime Africa, Pretoria
T Magagula	Prime Africa, Pretoria
Stefano Farolfi	Centre de Cooperation Internationale en Recherche Agronomique pour le Developpement (CIRAD), Montpellier
Ariel Dinar	Water Science and Policy Centre, University of California, Riverside, USA

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ACRONYMS

ARA	*Administração Regional de Águas*- Portuguese (Regional Water Authority)
CBI	Caribbean Basin Initiative
CMA	Catchment Management Agency
DNA	National Directorate of Water
GWP	Global Water Partnership
EIA	Environmental Impact Assessment
ICMA	Inkomati Catchment Management Agency
ICWE	International Conference on Water and Environment
ICWE	International Conference on Water and Environment
IIF	Inkomati Irrigation Forum
IWRM	Integrated Water Resource Management
JIBS	Joint Inkomati Basin Study
KJOF	Komati Joint Operation Forum
MDG	Millennium Development Goal
NWA	National Water Act
PNA	Palestinian National Authority
RBA	River Basin Authority
RBO	River Basin Organisation
REMCO	Remuneration Committees
TPTC	Tripartite Permanent Technical Committee
UNCED	United Nations Conference on Environment and Development
WB	World Bank
WSA	Water Service Authority
WSP	Water Service Provider
WSSD	World Summit on Sustainable Development
WUA	Water User Association

CHAPTER 1: INTRODUCTION

1.1 MOTIVATION AND BACKGROUND TO THE STUDY

Among the four so-called Dublin principles (ICWE, 1992) representing the pillars of the worldwide acknowledged concept of Integrated Water Resource Management (IWRM), stakeholders participation is the one calling for decentralization of water policies design and implementation. Effective decentralization requires devolution of authority and responsibility from the center, and acceptance of that authority and responsibility by local entities in the basin (Blomquist et al., 2005). In other words, the design and implementation of water management and allocation policies are transferred from the State to local institutions which are supposed to have a better knowledge of the catchment functioning and where representatives of local water stakeholders are allowed to negotiate and decide jointly water management strategies and measures to be put in place.

Over the past 20 years most African countries reformed their water laws and restructured their institutional and governance framework accordingly. For instance, South Africa (SA) voted its National Water Act (NWA) in 1998 leading to development of its National Water Resources Strategy (NWRS) in 2002. Zambia amended in 1994 its Water Act of 1970, Mozambique and Tanzania approved their National Water Policies, respectively, in 1995 and in 2002, and Namibia voted its Water Resource Management Act in 2004. While much effort and good will was put into decentralization reforms in many basins in the continent, results are not uniformly realized. For example, benefits from the implementation of such decentralization process were taken for granted during the design of the SA NWA. But sixteen years after the launch of the new national water policy only two Catchment Management Agencies (CMAs) have been established and are operational (i.e. Inkomati usutu and Breede Overberg), while many water user associations (WUAs) still struggle to find their place and role in the complex and sometimes confused context of water management in SA (Shreiner and Hassa, 2011; Chibwe, 2013).

The process of decentralization in the water management institutions is even less advanced in other African countries. Mozambique for instance, implemented comprehensive decentralization reforms since the 1990s by progressively setting up Regional Water Administration entities (ARAs). The only ARA currently fully operational is ARA-Sul (South), responsible for the southern part of the country up to the Save river. As for the other regional water authorities, ARA-Centro is already functioning, but continues to rely on substantial support from the government, and ARA-Zambezi is newly established. ARA-centro-Norte and ARA-Norte have not yet been established (Matsinhe, 2012)

Further in the continent, Tanzania provides another example where it became clear that decentralization without accompanying support measures can have negative results. Before decentralization there was a centralized technical department with regional branches that could help communities with their water systems. After decentralization, all the tasks at central level were reduced, on the assumption that district level departments would take them over. But there were no trained staff yet and no resources at the district level to do that work. As a result, technical support services to the communities collapsed (Sokile et al., 2005).

The process of water management decentralization in African countries is seen as a means of advancing river basin management at the lowest appropriate level. The very different stages of advancement in the African river basins agencies indicate the difficulty of implementing decentralization in practice. It therefore seems necessary to understand why some water agencies have succeeded more than others, what are the variables involved in such reform process, which variables have a positive or a negative impact on the implementation of decentralization processes in the African water sector, and which variables could be affected by policy interventions and how.

The purpose of this study is to contribute to filling this gap and attempt to address the above questions adapting to the African context an analytical framework developed and applied to similar situations elsewhere (Kemper et al., 2006). The analytical framework intends to capture the factors likely to be related to river basin management success and generate hypotheses that could be tested in actual settings where river basin management had been attempted.

No similar quantitative analytical framework to investigate factors of success and failure of decentralized water governance has been applied to African catchments previously. The only examples of quantitative analysis to study water decentralization processes found in the literature are two case studies run in Albania and Ghana (IBRD/WB, 2007). The first study used stakeholder analysis, whilst the second one introduced network analysis. Several qualitative studies looked at decentralization of water management and services in SA (Saleth and Dinar, 2000; Backeberg, 2005; and Woodhouse, 2008) but no quantitative framework is proposed or applied so far.

1.2 OBJECTIVES AND EXPECTED OUTCOMES OF THE STUDY

The main objective of this study is to improve our knowledge about and understanding of water decentralization processes in Africa. Specifically the study aims to achieve the following goals:

1. Investigate which variables positively or a negatively impact the implementation of decentralization processes in the African water sector, and which of could be effectively influenced by policy interventions and how.
2. Enable water sector decision-makers to identify and properly address those hurdles hampering a transfer of water management actions to the lowest appropriate level.

A number of social, economic, human health and environmental benefits are expected from carrying the study. First, successful decentralization of water management means local stakeholders' involvement in the decision-making processes concerning water. This is expected to improve the representation of all water users and therefore insures more equitable allocation of the resource among competing sectors. Second, a more efficient use of water can be reached if local knowledge about water demand and supply is mobilized to design and implement allocation strategies. Water management at the lowest appropriated level also reduces transaction costs due to redundant or inappropriate institutional frameworks. Another important benefit of successful decentralization relates to the fact that most urban and particularly rural domestic users in Africa do not have access to the minimum water requirement for satisfying basic human needs (e.g. 25l/capita/day) and they typically fetch water from unclean or polluted sources. Decentralized water management is meant to improve disadvantaged domestic water users' representation in the decision-making process concerning water access and uses which would improve their access to sufficient water supply and reduces exposure to waterborne diseases and health hazards widely spread in Africa especially among the urban and rural poor. Moreover, environmental sustainability is one of the pillars of IWRM. Decentralized decision making processes facilitate better understanding of the local problems of water uses at the catchment level. The identification of the ecological requirements (e.g. the Reserve in SA) for a catchment should be made through the involvement and participation of local stakeholders as they have better practical knowledge of local systems. Such an involvement can only be achieved through a decentralized decision-making process. Furthermore, stakeholders' participation in the definition of environmental standards increases dramatically the probability that these standards will then be respected and complied with, again contributing to lower transaction costs associated with monitoring and enforcement functions as known common burdens of centralized management systems.

1.3 APPROACH AND METHODS OF THE STUDY

Studies of river basin management have focused mainly on surveys of efforts of different governments and agencies to implement IWRM at national level. Few studies particularly dealt with decentralization such as the Curu, Jaguaribe and Metropolitana River Basins in Brazil, the Yellow River Basin in China, Lerma-Chapala Basin in Mexico, the Sao Francisco Basin in Brazil, the Bicol Basin in the Philippines, the Olifants Basin in South Africa, and the Cross Basin in Nigeria (Dinar et al., 2005). Other examples of river basin decentralization studies include: the Murray Darling river basin in Australia, the Jaguaribe and Alto Tiete river basins in Brazil, the Fraser river basin in Canada, the Tarcoles river basin in Costa Rica, and the Brantas river basin in Indonesia (Kemper et al., 2006).

The works cited above are mainly case studies which shed light on the direction of development in river basin decentralization. However, they do not allow yet the identification of generic reasons and forces behind decentralization. Specifically, these studies are mainly descriptive and do not incorporate the political, institutional, hydrological, cultural and historical as well as socio-economic variables and the way by which these variables may influence decentralization outcomes.

The methodology chosen for conducting the intended analysis of decentralization of water management in Africa under this research project will employ quantitative analysis tools that will take into account hydrological, socio-economic, cultural and historical conditions in each basin. The plan is to use and adapt to the African context the analytical framework of Kemper et al. (2006), Dinar et al. (2007), and Blomquist et al. (2008), who developed and implemented a comparative framework to explain river basin management decentralization reform processes and their performance. Their methodology permits both in depth case study analyses (Kemper et al., 2006; Blomquist et al., 2008) and quantitative estimates from a global set of river basins attempting decentralization (Dinar et al., 2007). The framework identifies and focuses primarily upon four sets of potentially observable variables (physical, financial, economic and equity indicators), and suggests hypotheses about the paths by which those variables are associated with the likelihood of successful or unsuccessful decentralization of river basin management. Success is conceived as having two main dimensions: 1) redirection of resource use away from a degenerative path and toward a sustainable one, and 2) engagement of water users and other stakeholders in decision making about management of the resource.

It has originally been proposed to apply the above analytical framework in two phases. In the first phase a detailed application of the case study approach of Blomquist et al. (2008) be modified and applied to a sample of basin organizations across the Southern Africa

region, representing various physical, economic and political situations. One river basin in SA (Inkomati), one river basin in Mozambique (Ara Sul) and one river basin in Zimbabwe (Umzingwane) that underwent decentralization reforms have been proposed for implementing the case study component in the first phase of the study. These catchments, all situated in the Southern Africa region, were chosen because they have all been exposed to a certain degree of institutional decentralization (establishment of CMAs, creation of basin authorities, WUAs etc.). For trans-boundary catchments, only the main national component was to be studied, to avoid overlapping of analyzed issues. The results of the cross-country (southern Africa region) proposed study will provide useful insights for policy makers who consider decentralization of river basins but have little or no experience, or those who aim at adjusting existing frameworks of decentralized river basins, that have not been well doing to achieve better performance.

While the case study analyses highlight the direction in decentralization of river basin management, they do not allow identification and systematic quantitative analysis of generic reasons and forces behind the decentralization process and performance. Accordingly a quantitative analysis applied to the decentralization of basins across Africa was planned to take place in the second phase of the study. The two phase approach was thought to enable careful modification of the set of variables used in the econometric study of Dinar et al. (2007) by adjusting the questionnaire used to carry that study to conditions prevailing in the Africa region.

This design and study plan was also chosen to provide a direct link and facilitate valuable complementarities between two research initiatives supported by a number of collaborating institutions over an overlapping time frame. The first was an initiative supported by the Water Research Commission (WRC), under the Institutional Governance and Reforms Program of its Water Resource Institutional Arrangements Thrust to carry sub-regional analysis on the progress and performance of experiences in implementing decentralization of water management in southern Africa in collaboration with the International Centre for Water Economics and Governance (IWEGA) and the Centre for Environmental Economics and Policy in Africa (CEEPA). This was coupled with another parallel initiative supported by the Water Science and Policy Centre (WSPC) of the University of California in collaboration with IWEGA and funding from the World Bank to carry similar investigation at continental level in Africa. Original plans and analytical approaches of the sub-regional analyses have been modified as implementation of study progressed for a number of reasons explained in the respective parts of subsequent chapters of the report.

1.4 ORGANIZATION OF THE STUDY REPORT

The next chapter of this research report presents a review of the literature relevant to the study of water governance and decentralization in Africa providing a framework for performance and a summary of the findings of the first phase of the project. Chapter two however concludes with a discussion of why and how the sub-regional study approach and focus have been modified for completion of the second phase of the project. A scoping review of institutional reforms and progress with decentralizing water management in the IRB chosen for conducting the sub-regional analyses is presented in chapter 3. Chapter 4 discusses and presents the modified analytical framework and proposed performance indicators to be evaluated in the sub-regional study. Methods of data collection followed for implementing the sub-regional study and results of the quantitative analyses of performance indicators of decentralization in the three countries sharing the IRB are presented in chapter 5. Conclusions and implications of the study are distilled in chapter 6.

CHAPTER 2: A FRAMEWORK FOR REFORM PROCESS AND PERFORMANCE ANALYSIS: AN APPLICATION TO THREE SOUTHERN AFRICAN RIVER BASINS

2.1 PREAMPLE

Countries of sub-Saharan Africa (SSA) have been experiencing serious problems with respect to the management of their river basins. In order to address these problems most SSA countries have introduced comprehensive reforms in the water sector towards applying the principles of IWRM, particularly its key component, decentralization of water management over the past 25 years (Sokile et al., 2005). The said reforms have substantially changed the institutional settings governing the water sector in these countries. These settings have been documented extensively within specific contexts and perspective of other countries (e.g. Vermillion, 1997; Savedoff & Spiller, 1999; Challen, 2000; Shirely, 2002; Dinar, 2000; Saleth & Dinar, 1999a, 2000, 2004; 2009; Backeberg, 2005). However, there is no evidence of existing studies that use an institutional economics framework to understand the river basin decentralization process and its performance in SSA.

A cross-country analysis aiming to understand the impacts of institutional factors on the dynamics of changes in river basin decentralization and its performance could be of important value for policy makers and water managers.

From a policy and applied point of view, this paper will highlight factors that affect the outcomes of decentralization process and its performance and give practical recommendations to governments and river basin stakeholders to what they must do to achieve integrated water resource management through decentralization.

This study use a sample of southern Africa selected river basins to assess their experiences with the decentralization process and its performance under varying institutional settings in Mozambique, SA and Zimbabwe. The selected river basins are the Inkomati in SA, Limpopo in Mozambique, and Muzingwane, which is the Zimbabwean segment of the Limpopo. Specific objectives of the study are to:

1. Review the institutional economics literature and describe the institutional economics frameworks that have been used to evaluate performance of decentralizing water governance and management
2. Propose analytical institutional economics framework to be employed for carrying this study

3. Describe the factors that are potentially related to the development of decentralized river basin management in the selected case study countries
4. Test and assess the suitability of the adapted analytical framework for wider applications at regional and continental levels planned for the second phase of the project

The chapter is divided into five sections. The next section provides a review of the institutional economics literature and analytical frameworks with major focus on water resources management. In section three an analytical institutional economics framework is proposed for implementing this study. Data and collection methods and results of the empirical analysis are discussed in section four. Conclusions and implications of the study are derived in section five.

2.2 REVIEW OF THE INSTITUTIONAL ECONOMICS LITERATURE

In order to best understand river basin institutional settings, we first define institutions and organizations and then we review literature on institutional economics. The revision is divided in three major parts: studies that have used institutional economics to measure economic performance followed by studies that analyzed natural resources and water resources, respectively.

2.2.1 INSTITUTIONS AND ORGANIZATIONS

In general, institutions are defined as organized, established procedures (Jepperson, 1991). These procedures reflect the constituent rules of society or rules of the game. For Bromley (1982), institutions are collective conventions and rules that establish acceptable standards of individuals and group behaviour. According to Scott (1995), institutions "consist of cognitive, normative, and regulative structures and activities that provide stability and meaning to social behavior". Commons (1968) defines institutions as the working rules of going concerns. These rules guide what individuals must or should not do, what they may do without interference from other individuals, what they can do with the aid of collective power and what they cannot expect the collective power to do on their behalf. North (1990) reports that, "institutions consist of formal rules, informal constraints (norms, behavior, conventions and self-imposed codes of conduct), and enforcement characteristics of both."

The definitions presented above suggest that institutions are the rules of the game including their enforcement. In order to enhance our understanding of institutions, it is necessary to distinguish segments that compose them. The components of institutions are institutional environment and institutional arrangements (Saleth and Dinar, 2004). According to Saleth and Dinar (2004), the institutional environment "is defined as a set of fundamental political, social, and legal rules that establish the basis for production, exchange and distribution." This definition implies that institutional environment

corresponds to the rules governing the society. These authors define institutional arrangements as "the structure within which members of a society (individually or collectively) cooperate or compete." The institutional arrangements incorporate the social, economic and political organizations that compose the society.

While institutions are the rules of the game, organizations are the implementers of the rules of the game. Institutions are the norms and principles that define organizations and organizations are entities that operationalize the institutions (Bromley, 1982). Specifically, within institutional settings, organizations are physical collection of institutions. For North (1990), organizations consist of group of individuals engaged in positive activity. According to Cernea (1987), organizations are "networks of behavioral roles arranged into hierarchies to elicit desired individual behavior and coordinate actions obeying a certain system of rules and procedures." Similarly, Merrey (1993) describes organizations as "structures of recognized and accepted roles." An economic definition of organizations is given by North (1990) who characterizes organizations as "purposive entities designed by their creators to maximize wealth, income, or other objectives established by the opportunities afforded by the institutional structure of the society."

In this study we define institutions to consist of collective conventions and rules (cognitive, normative, and regulative structures and activities) that establish acceptable standards for river basin management and governance. Accordingly, institutional arrangements in our case refer to the structure and the functions of organizations related to river basin management such as government departments, non-government organizations including river basin organizations.

2.2.2 INSTITUTIONAL ECONOMICS

Economists have often used neoclassical economic theory to explain natural resource management. However, this mainstream theory has been widely criticized because, among other reasons, it assumes institutions as given, not considered as an object of research (North, 1990). Additionally, neoclassic economics assumes that transactions can occur at zero costs[1] and that markets are perfectly efficient.

Conversely, in real-life natural resource management, transaction costs represent a large share of management costs. For instance, natural resources such as a river basin, fish stock and river basin water are considered, according to a classic classification of economic goods, common goods (common pool resources) since they are both non-excludable and rivalry in use. The first attribute suggests that if exclusion is to take

[1] Transaction costs represent the costs of specifying, measuring and enforcing agreements that underlie exchange (North 1990 and 1982). According to Saleth and Dinar (2004), "transaction costs refers to the effort, time and expenses involved in obtaining the information necessary to negotiate, make, and enforce an exchange".

place, it requires additional costs such as the cost of parcelling or fencing the resource and the cost of designing and enforcing property rights to exclude access to the resource. Additionally, if appropriate property rights are not assigned, free riding on the provision of the common-pool resources is expected. Costs related to specification and enforcement of the body of property rights as well as the costs of attempting to change the existing property rights (transaction costs) are therefore a large share of the natural resources management costs.

The notion of efficient markets suggests that economic agents have full and accurate information and the changes in market prices depend exclusively on supply and demand relationships. It is important to note that an exchange of goods and services among economic agents is a complex relation, which is determined by the balance between conflicts/convergences of interests among the main players (Rossiaud and Locatelli, 2010). For instance, the State owning natural resources might be interested in the sustainable use of these resources to meet future demand and preservation of a minimum stock, while the company both public and private to whom the exploration-production activities are delegated might be interested in maximizing its profit through overexploitation of the resource regardless of long-term social goals.

The existence of coordination problems (conflicts/convergences of interests among economic agents) yielded the development of institutional economic, which takes into account institutions when analyzing economic performance. Linked to institutional economics, theories such as property right analysis, the economic analysis of the law, public choice theory, the theory of collective action, transaction cost economics, the principal-agent approach, the theory of rational contracts and the comparative economic system were developed (Richter, 2005). Different from neoclassical economic theory, the theories mentioned above are similar given that they do not assume the institutional framework as given but consider institutions as an object of research and also seek to consider the implications of any given institutional arrangements for the stakeholders' economic behavior. In the following sub-sections we review studies that have applied institutional frameworks to analyze economic performance in general and natural resources management, particularly management of water resources.

A. INSTITUTIONAL ECONOMICS APPROACHES TO MEASURING ECONOMIC PERFORMANCE

The development economics literature provided a wide range of econometric analyses of the association between institutions and economic growth. The literature in this area is far too ample to be summarized here and to save space we will review a subset of these approaches. The institutional variables that have been used are political stability, coups and revolutions as well as political assassinations (Barro, 1991), political freedoms and

civil liberties (Kormendi and Meguire, 1985; Grier and Tullok, 1989), property rights and rent seeking (Tornell and Vellasco, 1992; Rama, 1993) and a combination of different institutional variables to explain economic performance. Knack and Keefer (1995), Hall and Jones (1999), Efendic et al. (2008), Glaeser et al. (2004), and Acemoglu et al. (2001) for instance, demonstrated that institutions that protect property rights increase economic growth and investments. North and Thomas (1973), Jones (1981) and North (1981) argued that countries with better institutions, more secure property rights and less distortionary policies, will invest more in physical and human capital and will utilize these factors more efficiently to achieve a greater level of income. The impact of institutions on economic performance has also been measured using the transaction cost approach (Wallis and Douglas, 1988; North, 1992). These authors found that transaction costs represent a significant portion of the GDP and impact economic performance of a given country.

B. INSTITUTIONAL ECONOMICS APPROACHES TO NATURAL RESOURCES MANAGEMENT

The management of natural resources (common pool resources) has usually been performed by central governments, and this has led to several social and economic problems (World Bank, 1993). In order to improve the management of natural resources, societies have developed institutions and rules to take care of locally available natural resources (North, 1990). Empirical evidences have shown an association between institutions and sustainable use of natural resources (Cordell, 1978; Clark, 1974; Larson and Bromley, 1990; Deacon, 1994; 1999; and Bohn and Deacon, 2000). These studies have demonstrated that efficient institutions are associated with sustainable use of natural resources.

Deacon (1994) examined the impact of clear and secure property rights and the nature of political system on deforestation. His results showed that the presence of revolutionary activity is associated with deforestation rates that are 6.8 to 10.5 percent higher than those of countries without revolutions. Similarly, deforestation rates tend to be about 4 percent higher under military regimes and lower at 3 percent in parliamentary democracy regimes. Bohn and Deacon (1994) analyzed the impact of ownership risk on deforestation rates. Their results revealed that countries with less ownership risk experience greater forest growth while countries with more ownership risk experience greater deforestation rates.

Institution building at the community level for managing natural resources has been suggested in the literature (Wade, 1987; Jodha, 1986; Ostrom, 1990). These authors argue that decentralization of natural resource management increases transparency and stakeholder participation in decision-making, which are more likely to result in improved

natural resource management. Additionally, Besley and Coate (1997), Conyers (1985), Shah (1998) and Wails and Oates (1988) point out that by having the service receivers as a part of decision-making process through decentralization, the service provider responds better and in a more equitable manner to local needs, which improves in efficiency through lowering transaction costs.

However, empirical literature has indicated mixed results regarding the management performance of natural resources under community based institutions. Some authors (Shackleton et al., 2001; Beck and Nesmith, 2001) report that poorer households, specifically landless, benefit less from community based forest management in Nepal.

These mixed results suggest that decentralization of natural resource management through the creation of community based institutions does not always provide adequate incentives and conditions for sustainable management of natural resources. The success of natural resource management depends on local stakeholders' participation and institutional arrangements (Shackleton et al., 2001). Fabricius and Collins (2007) point out that the good governance of natural resources depends upon the development of knowledge networks that draw on the experience and wisdom of a wide range of key individuals, establishment of formalized decision-making structure with clear constitutions and code of conduct, clear definition and legitimization of conflict resolution procedures, insurance of acceptance of the governance structure by community members, establishment of formal commitment to well-defined roles and responsibilities of the key individuals and establishment of tangible incentives for the key individuals.

C. INSTITUTIONAL ECONOMICS APPROACHES TO WATER RESOURCES MANAGEMENT

Decentralization[2] of water resource management to the lowest appropriate level has become a major component of recent water reforms around the world. Academics, policy makers and national and international donor agencies as well as non-government organizations (NGOs) have all been working on water projects with decentralization components. Empirical evidence from river basins in the developed and developing world shows that decentralization of water management has determined tremendous achievements in conflict and pollution reduction, productive and allocative efficiency, and environmental sustainability (Blomquist et al., 2005; Blomquist et al. 2005a; 2005b; Dinar et al., 2005). Likewise, Wester et al., (2001) in the Lerma-Chapala Basin, Mexico

[2] Following Dinar et al. (2007) in this study decentralization is defined as the redistribution of power and allocation of resources with more authority being shifted away from the central government level to lower levels of government.

also noted that water governance decentralization led to sustainable water resource management, enhanced water services and integrated watershed management.

Although decentralization of water management was reported to produce positive impact, some scholars argue that in various cases it has negative consequences. Stalgren (2006) argues that political entrepreneurs at the national level strategically position themselves by influencing the 'construction of reality' in matters of water governance decentralization at the local level to their advantage. Smith (1983) and Fesler (1968) also argue that decentralization promotes parochial and separatist tendencies and may deepen enclaves of authoritarianism as well as exacerbate inequalities. Kambudzi (1997) states that democratization of water may go beyond our intention and turnout to be a recipe for further disaster. Finally, Helmi (2001) showed through a study carried out in the Indonesian province of Central Kalimantan that decentralization processes at the national, district and village levels led to highly volatile socio-legal configurations that created insecurity.

In the light of these mixed views on decentralization in water governance, it can be concluded that the outcome from the decentralization process of water management often depends on the manner in which the process is operationalised. Blomquist et al., (2005) argue that the whole process of success or failure of decentralization is context specific as it can be affected not only by political will but also by a host of other interconnected factors that could be historical, legal, social, cultural, physical or institutional in nature.

While for the Australian Murray-Darling basin (Blomquist et al., 2005b), the Brazilian Jaguaribe basin (Johnsson and Kemper, 2005) and the Indonesian Brantas basin (Blomquist et al., 2005a) stakeholder involvement might have translated significantly into effective river basin management, in the Costa Rican basin of the Tarcoles and the Spanish basin of Guadalquivir, an interesting observation was made. In these two catchments decentralization was compromised significantly by translation of stakeholder participation into 'stakeholder protectionism' wherein a dominant group of stakeholders use their numbers and privilege to participate to their selfish advantage. For instance, in the Spanish Guadalquivir basin, irrigators constituted a significant number of the stakeholders and they consumed most of the water yet they were exempted from paying water tariffs (Blomquist et al., 2005c). The same scenario prevailed in the Costa Rican Tarcoles basin where hydropower producers made the most non-consumptive use of water yet they did not pay water tariffs (Blomquist et al. 2005d).

While other issues are context specific, from the available international and local literature it seems that the majority of the cases of failure have communication problems at the core. Blomquist et al. (2005) state that the way in which communication regarding decentralization takes place is the key factor determining the outcome of decentralization

process. Through their work in the Guadalquivir River Basin, Spain, they have noted that the decentralization process could have yielded good results if communication with key stakeholders was established (Blomquist et al., 2005c). In the same vein, Sithole (2000) and Manzungu (2001) report that in Zimbabwe, communication hampered effective participation by marginalizing groups through use of an alien (foreign) language, alien practices and information asymmetry. Additionally, being looked down upon as being ignorant by other better-off stakeholders modelled the context in which the marginalized groups were further marginalized in the Zimbabwean Lower Gwayi sub-catchment (Sithole, 2000; Manzungu, 2001).

The common approach that has been used to analyze decentralization reforms of river basin management is the case study approach of Blomquist et al. (2005). Studies that include quantitative analysis of river basin decentralization reforms are lacking except the work by Dinar et al. (2007) and Saleth and Dinar (2004). Saleth and Dinar (2004) used the institutional decomposition and analysis (IDA) framework to analyze the performance of the water sector. The IDA framework illustrated in Figure 2.1 below shows that performance of the water sector is a function of water institutions and other factors outside (exogenous to) the water sector. The main components of water institutions are water law, water policy and water organizations with subcomponents within each. The arrows show the interactions among water institutions, other factors outside water institutions and water sector performance. Some of these linkages have direct and immediate effect while others have indirect effects.

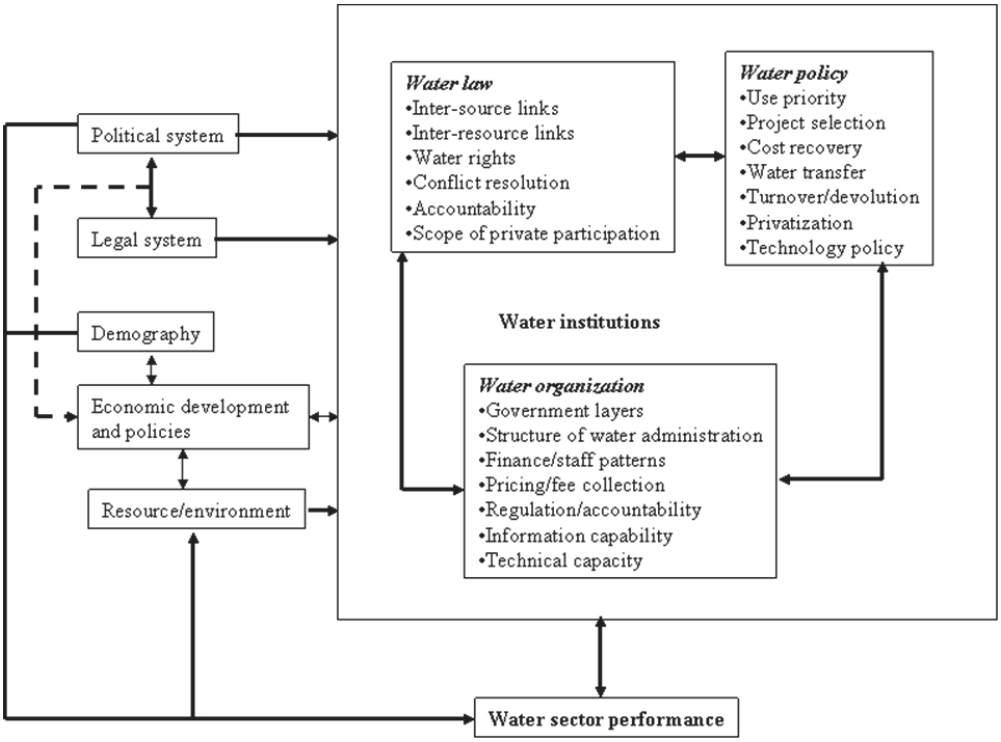

Figure 2.1: Factors affecting water sector performance and their interaction.
Source: Adapted from Saleth and Dinar (2004)

Blomquist et al. (2005), Dinar et al. (2007), and Blomquist et al. (2008) identify a number of political and institutional factors, which may be associated with the emergence, sustainability and success or failure of decentralization initiatives of river basins. The various factors identified by the framework are derived from the institutional analysis literature relating to water and other natural resource management and to decentralized systems of governance (Blomquist et al., 2005; Bromley, 1998; Easter and Hearne, 1993). The four major factors are: (a) contextual factors and initial conditions, (b) characteristics of decentralization process, (c) characteristics of central government/basin-level relationships and capacities, and (d) internal configuration of basin level institutional arrangements (Figure 2.2).

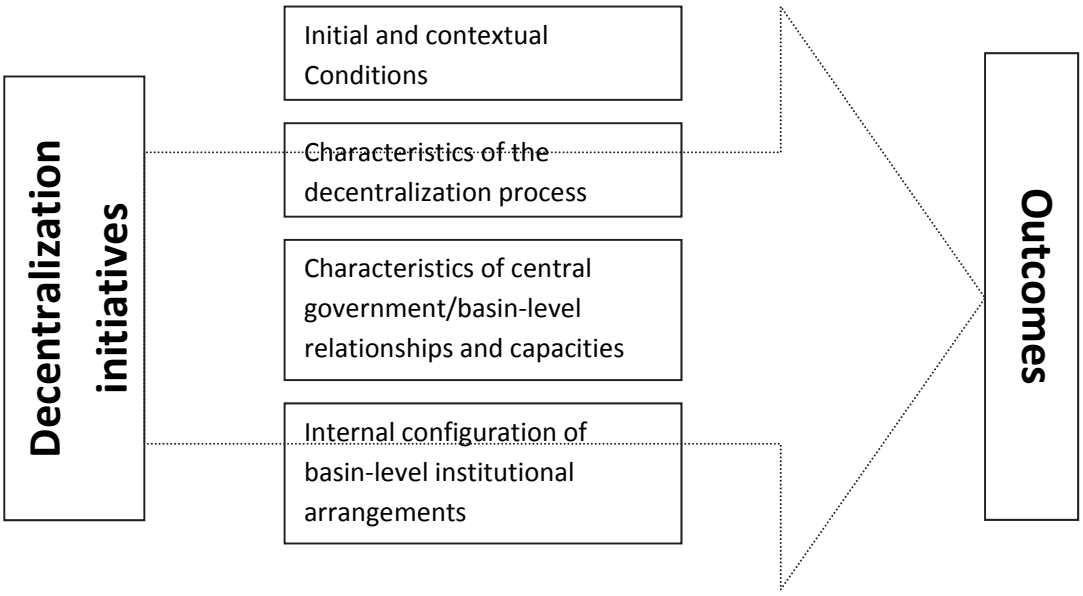

Figure 2.2: Institutional economics framework for analysis of decentralization performance. Source: Adapted from Dinar et al. (2007)

The various factors that influence the outcomes of decentralization are not directly linked to the decentralization initiative success or failure, but influence incentives and conditions that are linked to the success or failure of basin management as discussed below. Empirical evidences suggest that the initial conditions, which are primarily elements of the socio-economic setting that prevailed at the time when decentralization initiative was attempted, represent an integral component and determining factor in the outcome of decentralization efforts. According to Blomquist et al. (2005), the level of economic development of the nation is a key variable affecting the financial capacity of the central government to bear transition costs associated with decentralization. Zack and Knack (2001) point out that social and cultural diversity among stakeholders is an important factor, which may affect decentralization outcome through its communication and trust effects. Blomquist et al. (2005) argued that the ability of managing water resources will more likely depend on river basin stakeholders' previous experience with other public services. Dinar et al. (2007) indicated that stressed resource conditions (persistent water scarcity and quality) and the existence of multiple major problems can stimulate action towards decentralization reforms.

Devolution of authority and responsibility from the centre, and acceptance of that authority and responsibility at the local level is the second main components affecting the outcomes of decentralization reforms. Blomquist et al. (2005) report that bottom-up decentralization initiatives often lack a well-defined legal role and mandate. On the order

hand, Dinar et al. (2007) found that decentralization process, which is initiated by central government (top-down devolution), is likely to be inefficient and end in lower levels of decentralization performance. Empirical evidence has shown that a highly disputed decentralization initiative was associated with poorer performance (Dinar et al., 2007). In order to have an efficient decentralization initiative, responsibility should be given to a level where stakeholders are empowered to participate in decision making about the management of the scarce resource (Van Wilgen et al., 2003; Dinar et al., 2007; ACWR, 2006). Stakeholder participation in decentralization is likely to increase and be stable if local community governance institutions and practices are recognized and incorporated in the decentralization process. It has also been noted that a change in country's government during decentralization might produce changes in the decentralization policy, which can confuse the mission of government agencies involved in the decentralization process (Blomquist et al., 2005).

The success of decentralization initiatives seems to be a joint effort performed by the central and local level governments. The announced decentralization process can be symbolic (e.g. written documents advocating participation of local stakeholder while in practice the government has control over significant resource management decisions). This is expected to result in low performance of decentralization (Blomquist et al., 1995). Endowment with adequate resources (e.g. RBO budget) is important for successful decentralization but complete transfer of financial responsibility from central government to local authority might produce undesirable results (Dinar et al., 2007; Blomquist et al., 1995). The ability of local authorities to design their own institutional arrangements is more likely to attract more active involvement from basin-level stakeholders (Blomquist et al., 2005). The same authors while recognizing the complexity of the relationship between implementation time and success of decentralization, they argue that decentralization needs adequate time to stabilize.

Basin-level and local-level institutional arrangements established by basin-level stakeholders and/or central government officials (e.g. presence and recognition of basin-level governance institutions and forums and clarity of institutional boundaries) make up the final set of variables deemed critical in the successful implementation of river basin decentralization (Ostrom, 1990).

2.3 ANALYTICAL INSTITUTIONAL ECONOMICS FRAMEWORK OF THE STUDY

Among the various approaches described above the framework proposed by Blomquist et al. (2005), Dinar et al. (2007) and Blomquist et al. (2008) depicted in figure 2.2 above is chosen to be applied in this study to analyze performance of river basin decentralization processes experienced under varying institutional settings in Mozambique, South Africa

and Zimbabwe. This approach allows for micro level analysis as it is capable of analysing performance of decentralization at a single river basin level. To pursue the third and fourth objectives of the study stated in the introduction section, the following sections adapt the described framework and test its suitability through its application to the selected case studies.

The analytical relationships depicted in Figure 2.2 between river basin decentralization performance and institutional variables can be specified for empirical analyses purposes by the following model:

$$P = g(C, D, G, I, X) \quad (1)$$

Where P is a vector of river basin decentralization performance indicators and C, D, G, and I are vectors of measures of the four institutional factors defined in the analytical framework of Figure 2. We assess the river basin decentralization performance P using the following indicators: (a) the level of accomplishment of the river basin objectives, (b) the degree at which stressed resource conditions have been affecting the river basin stakeholders before and after the decentralization process and (c) the level of authority given to different stakeholders to manage river basin resources before and after the decentralization process. We expect high decentralization performance if the objectives of decentralization process were accomplished, if the condition of the stressed river basin resources has improved and if more river basin management decisions are made at lower levels after than before decentralization.

C is a vector of variables representing contextual factors and initial conditions involved in the reform process. The key pre-identified factors and conditions cited in the literature (Blomquist et al., 2005; Dinar et al., 2007) are: (a) the level of economic development within the nation and (b) the level of economic development within the catchment area, (c) the initial distribution of resources among basin stakeholders (d) the socio-cultural diversity among basin stakeholders, and (e) the local experience with self-governance and service provision. All other factors being equal, we expect economically developed basins to be more successful with decentralization than less developed basins. Moreover, holding everything else constant, we also expect basins with homogeneous societies and particularly those with strong formal and informal institutions to have a successful decentralization process compared to basins with heterogeneous societies and with weak formal and informal institutions.

Vector D represents variables measuring indicators of the characteristics of the river basin decentralization process. Following Dinar et al. (2007), we evaluate decentralization process using the following variables: (i) the type of devolution of decentralization (top-down, bottom-up and mutually desired), (ii) incorporation of

existing local governance arrangements and level of involvement of the river basin stakeholders in the decentralization process, (iii) the transaction costs of the decentralization process measured by several variables such as institutions created and dismantled during decentralization process, and (v) consistent central government commitment. Holding everything else equal, we expect better performance if decentralization follows a bottom-up approach or based on mutual agreement between central government and local stakeholders. Additionally, we expect high performance if new institutions created through decentralization were built from existing local organizations.

G is a vector of variables representing the characteristics of central government/basin-level relationships and capacities (such as the nature of distribution of river basin management responsibilities), According to Blomquist et al. (2005), the variables in this category are: (a) the extent of devolution of responsibilities and decision making; (b) financial autonomy and financial resources at the basin level, (c) basin level authority to modify and create institutional arrangements, (d) distribution of national level political influence among stakeholders, (e) characteristics of water right systems and (f) adequate time for implementation and adaptation. All other things being equal, we expect decentralization process to be successful when autonomy and or flexibility (technical and financial) are given to local river basin organizations. Additionally, holding everything else constant, decentralization process is expected to succeed if central government funds are managed by the central government and local-river basin funds fully managed by local-river basin organizations. Finally, everything else being equal, we expect river basin reforms to succeed if local stakeholders are able to create and implement institutional arrangements for resource management including cross-jurisdictional arrangements.

I is a vector of variables reflecting internal configuration of basin-level institutional arrangements, which include the following variables: (a) presence of basin-level governance institutions, (b) clarity of institutional boundaries, and their match with basin boundaries, (c) recognition of basin-level communities of interest by basin-level institutional arrangements, (d) availability of forums for information sharing, communication, and conflict resolution. Holding everything else equal, we expect the decentralization process to be successful when information sharing and communication among stakeholders are effective and in settings where forums for conflict resolution exist. X is a vector of other variables associated with other river basin specific attributes, such as river basin size, population, etc.

2.4 THE DATA AND RESULTS OF THE EMPIRICAL ANALYSIS

This study uses a case study approach and is based on both primary and secondary data. The units of analysis are the selected river basins, namely the IRB in SA, the Mzingwane basin in Zimbabwe, and the Mozambican portion of the Limpopo basin, which is under the management of ARA-Sul. The data were collected in the three selected river basins using a structured questionnaire, which is composed of five major sections, namely: (1) river basin organization identification, (2) river basin characteristics, (3) decentralization process, (4) decentralization performance, and (5) basin comparisons[3]. This study employed a non-random (purposive) sampling (Prinsloo, 2008) where respondents with best knowledge and experience in river basin decentralization were deliberately chosen to provide the information sourced in the questionnaire since the main objective of the study is to assess the impact of institutional factors on river basin decentralization and its performance. This technique is appropriate in case studies where a small sample composed of key informants is selected from the target population (Saunders et al., 2007).

The number of survey respondents varied among the three river basins. In the IRB, 25 key informants representing different stakeholder groups were interviewed. The interviewees included the Inkomati CMA senior staffs, agents from the Department of Water Affairs and the Department of Agriculture Regional Office in Mpumalanga, the local municipalities of Ehlanzeni District and Bushbuckridge, the Bushbuckridge Water Board, a private water and sewerage services company (Silulumansi-Sembcorp), the South African Local Government Association (SALGA), Irrigation Boards and water user associations (WUAs). Emerging farmers and other farmer organizations were also interviewed. Other industry players like, TSB Sugar, Eskom and mining companies like Fairview Mine, which is part of Barberton Mines were also interviewed. This ensured both spatial coverage as well as demographic and socio economic diversity of the respondents.

In Mzingwane river basin, the source of information was the WUAs. In total, 125 key informants from different WUAs were interviewed out of which 8 questionnaires were discarded due to unsuitability for incomplete information. Finally, in the Limpopo river basin, 21 key respondents were interviewed, mainly from current and former leaders of the National Directorate of water (DNA), ARA-Sul officials and WUAs. In the three countries, secondary data were collected from different governmental, non-governmental and private institutions related to water sector.

[3] The research efforts reported here are based on studies implemented by post-graduate students from the three countries involved as their master degree thesis research projects completed at the University of Pretoria and University of Zimbabwe and funded under this project by the WRC (Chibwe, 2013; Matsinhe, 2012; Musinake, 2012).

The survey respondents were not able to answer all survey questions and therefore, one questionnaire was filled in each basin using data provided by the different respondents and taken from secondary sources. That means the study has only three data points representing the three river basins for conducting the intended analysis. It was accordingly not possible to implement the quantitative analysis implied by the proposed analytical framework because of the limited number of observations given the number of parameters to be estimated in the above presented empirical model. As discussed in Chapter one, the second phase of the project plans to carry a continent-wide quantitative study for which data will be collected in all available SSA river basins using the questionnaire developed and tested in this study. The continental study survey will have sufficient data points to allow application of the empirical model specified above to analyze the impact of institutional factors on the performance of decentralization of water management in SSA river basins.

Our case study approach therefore used information gathered from the survey on the decentralization process and institutional factors discussed above to achieve objective three (describe the factors that are potentially related to the development of decentralized river basin management in the three basins) and objective four (test and assess the suitability of the adapted analytical framework for wider applications at regional and continental levels planned for the second phase of the project). The study survey findings on the river basin decentralization performance P as well as associated institutional variables (vectors D, C, G, I, and X in equation 1) are presented and discussed in more detail in Chibwe (2013), Matsinhe (2012), and Musinake (2012). In order to achieve objective three we create river basin decentralization process and performance indicators for the three river basins using river basin decentralization performance and associated institutional variables. Results of this analysis are presented and discussed in more detail in Chibwe (2013), Matsinhe (2012), and Musinake (2012). The remainder of this section compares the experiences of decentralization process and performance of the three case study river basins. We first discuss decentralization process followed by decentralization performance.

2.4.1 DECENTRALIZATION PROCESS

Table 2.1 below presents the summary of results of decentralization process in the three river basins discussed in more detail in Chibwe (2013), Matsinhe (2012), and Musinake (2012). Specifically, Table 2.1 summarizes for the three river basins results about: (i) length of the decentralization process, (ii) transaction costs of decentralization in terms of the number of institutions created and dismantled during the process, (iii) level of involvement of stakeholders, and (iv) type of devolution of decentralization process.

Survey results show that all three basins implemented decentralization but the number of years that decentralization has been underway varied between basins. While the length of time needed is difficult to establish, it has been argued that adequate time must be allowed for changes to complete and stabilize the decentralization process (Blomquist et al., 2005). Hence all basins are assigned a value of 1.0 (numbers in parenthesis in Table 2.1) because all of them have been undergoing decentralization for more than 5 years.

The results also reveal that decentralization has created local level institutions in the three river basins and therefore, all basins are assigned the value of 1.0. The level of involvement of river basin stakeholders in river basin decentralization process varied among the three river basins. River basin stakeholders appear to be more involved in the Inkomati compared to Mzingwane and Limpopo river basins. Therefore, IRB is assigned a value of 1.0 while the other basins are assigned the value of 0.0 due to the weak involvement of stakeholders.

Inkomati is assigned a value of 1.0 since it followed a bottom-up approach while other basins are assigned the value of 0.0 for following a top-down approach while the other basins. Inkomati scored 4.0 in the overall evaluation of the decentralization process compared to a score of 2.0 for Mzingwane and Limpopo river basins. While decentralization in all basins is supported by the creation of CMAs, the higher stakeholders' involvement through a bottom-up process towards mutually desired devolution followed are expected to be major forces contributing to successful decentralization in the IRB. The level of decentralization process is believed to increase in settings where local people participate in decentralization initiatives (Blomquist et al., 2005).

Nevertheless, the IRB has not yet been fully decentralized as only two WUAs are currently fully operational out of 27 irrigator boards that are supposed to be transformed to WUAs. Additionally, the weaknesses of decentralization process in IRB might be explained by the lack of financial resources managed by the river basin organizations since water tariffs are still collected by the Regional Office of DWA. Dinar et al. (2007) report that river basins with financial autonomy are likely to be more decentralized than river basins without financial autonomy.

Attempts to decentralize Mzingwane river basin seem to have resulted in de-concentration. This is because Mzingwane river basin organizations (ZINWA) are mainly government controlled at catchment and sub-catchment levels rather than managed by local stakeholders' organizations. This in addition to the top-down devolution approach and limited financial resources are more likely to be associated with poor decentralization outcomes in Mzingwane. A similar situation seems to prevail in the Limpopo where river basin organizations such as UGBL, HCEP and BLIS are mainly government controlled.

Table 2.1: Summary of Decentralization Process in the Three River Basins

Decentralization process	Inkomati River Basin	Mzingwane River Basin	Limpopo River Basin
Length of decentralization process (years)	7 (1.0)	11 (1.0)	18 (1.0)
Institutions created, dismantled during decentralization process	Decentralization created Inkomati CMA and two WUAs (Elands and Upper Komati). Twenty five irrigation boards are in process to be dismantled and to become WUAs. (1.0)	Decentralization dismantled the Department of Water and Development including its local representations and created and created Ministry of Water Resources and Rural Development, ZINWA, Catchment and Sub-catchment councils as well as WUS. (1.0)	Decentralization created Directorate for water and national water agencies at national level and created GBL, HICEP, BLIS and Water user associations at local level. (1.0)
Level of involvement of the river basin stakeholders in the decentralization process	Local stakeholders are involved in decentralization process. Examples include the involvement of commercial farmers and other stakeholders in drafting water laws as well as the diversity in the composition of ICMA board. (1.0)	Local stakeholders are not involved in decentralization process. Examples include the creation of ZINWA that was solely made by the government and the selection of stakeholders to river basin organization boards that are mainly performed by ZINWA and the government. (0.0)	Local stakeholders are not involved in decentralization process. Examples include the creation of ARA-Sul that was solely performed by the government and the selection of stakeholders to boards of basin level organizations (HICEP, BLIS, and UGBL) that is mainly performed by the central
Type of devolution of decentralization process.	Bottom-up (1.0)	Top-down (0.0)	Top-down (0.0)

Note: The number within parenthesis represents the score assigned for each decentralization process variable. Each variable takes a value of 1.0 if its results contribute for a creation of decentralized river basin and 0.0 otherwise.

2.4.2 DECENTRALIZATION PERFORMANCE

Table 2.2 below presents the summary of results of decentralization performance in the three river basins, specifically, (a) the level of accomplishment of the river basin objectives, (b) the degree to which stressed resource conditions have been affecting stakeholders before and after the decentralization process, and (c) the level of authority given to different stakeholders to manage river basin resources before and after decentralization. The results indicate that Inkomati and Mzingwane river basins have reached partially the RBOs objectives while in Limpopo the level of accomplishment of RBOs objectives appears to be unknown, suggesting a performance indicator score value of 1.0 for Inkomati and Mzingwane and 0.0 for Limpopo. All basins have improved the conditions of stressed river basin resources. However, decentralization of Mzingwane and Limpopo river basins has worsened the conditions of some stressed basin resources such as land degradation and river ecology. This outcome puts Mzingwane and Limpopo behind in performance (scoring 0.0) compared to the Inkomati (scoring a value of 1).

Decentralization seems to have allowed river basin organizations of the three basins to be involved in the management of basin resources and mainly water administration. Infrastructure financing, water quality enforcement and collection of water tariffs are still being performed by government in the three river basins. These results indicate that decentralization in these basins has been progressing since local RBOs are now responsible for the management of some river basin activities and therefore all basins are assigned a value of 1.0. Decentralization in the Inkomati appears to have performed better than the other two river basins as it achieved an overall performance evaluation score of 3.0 followed by Mzingwane, which scored 2.0 whereas Limpopo came last in performance. The fact that the Inkomati CMA has been receiving funds from the government to implement river basin activities seems to be one key factor of the better performance record. Also while stakeholders in the Inkomati and Mzingwane river basins have developed catchment management plans, the stakeholders of Limpopo do not seem to have accomplished any major river basin activity yet (Chibwe, 2013; Matsinhe, 2012; Musinake, 2012).

Table 2.2: Summary of Decentralization Performance in the Three River Basins.

Decentralization Performance	Inkomati River Basin	Mzingwane River Basin	Limpopo River Basin
Degree of accomplishment of original objectives of river basin decentralization process	The RBOs have the following objectives: improve water scarcity and water conflicts as well as assuring water quality. Decentralization process improved by 25% the problems related to water scarcity and conflicts and by 50% the problems related to water quality. (1.0)	The RBOs have the following objectives: reduce water conflicts and improve equitable allocation of water permits. Decentralization decreased water conflict problem by 75% and did not improve water allocation. (1.0)	The RBOs have the following objectives: improve water allocation and distribution and crop production. The level of achievement of these objectives is unknown. (0)
Comparing of the level of problems related to river basin stressed resources before and after decentralization process.	Decentralization initiative did not change the state of problems related to water scarcity, floods, environmental quality, land degradation (erosion, salinity, etc.) and river ecology but improved the availability of water and reduced water conflicts. (1.0)	Decentralization process decreased the problems related to water scarcity, water conflicts and water conservation and storage and increased problem related to river ecology and land degradation. (0.0)	Decentralization improved availability of water and increased problems related to land degradation and water conflicts. (0.0)

Level of authority given to different stakeholders to manage river basin resources before and after the decentralization process	Responsibilities regarding water administration, water quality enforcement and water quantity management are equally shared by both local organizations and government agencies after the implementation of decentralization process. Decentralization initiative did not improve the participation of local organization in management of infrastructure financing and setting water quality standards. Management activities related to awarding water rights, water allocation, modelling and forecasting water availability, monitoring and enforcing water quality and collecting water tariffs are performed by Regional Office of the Department of Water Affairs. (1.0)	Water administration is performed by both local government (25%) and local river basin organizations (75%). Decentralization initiative did not improve the participation of local organization in management of infrastructure financing, water quality enforcement and setting water standards. Decentralization changed water rights to two years renewable water permits. Management activities regarding to water allocation, modelling and forecasting water availability, monitoring and enforcing water quality and collecting water tariffs are performed by ZINWA. (1.0)	Management activities related to infrastructure financing, water quality enforcement and setting water standards are performed by central government. After decentralization, management activities related to water administration are performed by local government (25%) and river basin organizations (75%). (1.0)

Note: The number within parenthesis represents the score assigned for each decentralization performance variable. Each variable takes a value of 1.0 if its results contribute to an increase in performance of decentralization process and 0.0 otherwise.

2.5 CONCLUSIONS, IMPLICATIONS AND LIMITATIONS OF THE STUDY

This study showed that attempts to decentralize management of the Inkomati, Mzingwane and Limpopo river basins in SA, Zimbabwe and Mozambique, respectively have been supported by ratifications of water laws leading to creation of river basin level institutions (organizations and other mechanisms) to manage basin resources. Examples of local level organizations include the Inkomati CMA in SA, the Zimbabwe National Water Authority in the Mzingwane river basin and the Limpopo River Basin Management Unit in Mozambique. Establishment of systems for information sharing among stakeholders, commonly performed using basin meetings is one example of mechanisms which facilitate the management of river basin management.

None of the studied river basins can be considered fully decentralized and the decentralization processes varied among the three case study basins. The Inkomati was found to be more decentralized compared to Mzingwane and Limpopo river basins where the process appears lagging behind. Variations in key institutional factors seem to be the reason behind these differences. The positive outcomes of the IRB decentralization process are linked to the type of devolution (mutually desired process) followed, which resulted in larger involvement of local stakeholders, compared to the weak involvement of river basin stakeholders in the Mzingwane and Limpopo river basins due to the top down devolution approach followed.

Similar to the decentralization process, results of the evaluation of performance of the decentralization initiatives in the three river basins are mixed. Although RBOs in the three countries do not have financial management autonomy, the Inkomati shows the best performance, followed by Mzingwane, which seems to outperform the Limpopo river basin. Participation of stakeholders in the management of river basin resources has been a crucial factor determining these differences. It is important to note that the establishment of participatory mechanisms in decision-making involves shifting powers from central government to the basin level. While governments (e.g. policies and laws) of the studied river basins have shown high willingness and commitment to decentralized river basin management, concentration of power seems to be the key factor that negatively impacted the performance of the studied river basins. In Zimbabwean for instance, the government continued to concentrate management powers in the Zimbabwe Water Authority (ZINWA) in Mzingwane, and similarly, powers in managing the Limpopo basin remain concentrated in the river basin organizations (UGBL, HCEP, BLIS), which prevented participation of local stakeholders in river basin management and consequently reduced decentralization to de-concentration in these two river basins. It is also important to highlight that the process of decentralization reforms requires years, even decades and therefore central governments should be prepared to extend their commitment to decentralization reforms for many years to come in order to achieve successful decentralization of WRM.

A number of shortcomings however, limit the robustness of the results of this study. First, the analysis is based on only three data points representing the composite responses of

interviewed key informants in the three case study river basins. This did not allow implementation of the proposed analytical framework and empirical model, which requires estimation of a much larger number of parameters. Such analysis will be achieved by a continental study to follow that will survey sufficient number of river basins in SSA. Second, testing of the original questionnaire designed for implementing the proposed institutional economics analytical framework in this study suggested few necessary modifications to be made before adopted in conducting the bigger continental study. Removal of section 2 in the original questionnaire, information for which is more appropriately compiled from secondary sources is one key modification recommended by this study. Implementation of the original questionnaire in this study revealed that information related to financial status of the river basin is difficult to capture and hence questions about financial aspects have been modified in order to improve response rates and data quality.

Phase 2 of this project will undertake quantitative analysis of data to be collected in all available SSA river basins using the modified questionnaire. The second phase continental survey will be conducted by a South African consultant while the econometric analyses of the collected data will be led by the WSPC based at University of California, Riverside in collaboration with IWEGA based at Eduardo Mondlane University, Mozambique. The WRC-RG however, considered the above analysis of the process and performance of decentralization of water management in the three southern Africa river basins not sufficient for the objectives of Phase one of the project. The WRC-RG also thought that the intended continental survey and analysis will be of high relevance and policy value for higher levels of management at river basin level but will not provide enough information for assessing progress and performance of decentralization reforms and experiences at regional and national levels in the southern Africa context. It has accordingly been the decision of the WRC-RG to extend the regional analysis of Phase I of the project to address its current shortcomings.

The main objective of the expanded study in Phase one of the project is to conduct further analysis investigating progress and performance of decentralization of water management reforms in the region applying an adapted version of the above tested institutional economics analytical approach, methodology and questionnaire suited for the southern Africa regional and national contexts and experiences in implementing IWRM. This investigation will rerun the survey with the adapted questionnaire in the three countries sharing the IRB, namely SA, Swaziland and Mozambique. Through this extension of Phase I activities, the WRC-RG hopes to achieve the following main outcomes:

1. A methodology and suite of indicators that can be used to measure progress with regards to institutional decentralization
2. Initial testing of this methodology and modified survey instruments to understand its usefulness as well as to provide a baseline assessment before application
3. Apply the tested methodology and survey instruments to a suitable case study in the region

The IRB was recommended as a possible case study for completing the expanded phase analysis given the following distinct advantages:

a. It has international, national and local dimensions of river basin management decentralization
b. Institutions have been established within the various states sharing the river basin
c. There is a broad policy alignment in terms of intent toward implementing IWRM

The main goals of the expanded analysis of Phase I have consequently been defined by the WRC-RG to perform the following set of activities in pursuit of above objectives:

1. Review institutional challenges experienced within the IRB to provide a platform for better understanding and identification of the approaches and indicators that can be used as part of the methodology development (Chapter 3)
2. Review approaches and indicators towards evaluating institutional decentralization, and develop a revised methodology that is replicable in other similar river basin situations (Chapter 4)
3. Identify all currently operational water management institutions (CMAs, WUAs and other platforms) in riparian countries (SA, Swaziland and Mozambique) using the IRB as a reference point. The intention is to survey across the water sector, at various levels, so as to develop an understanding of the process gaps and challenges and make useful suggestions for future reform processes (Chapter 5)
4. Survey the institutional framework within the IRB employing a questionnaire and interviewing of key informants within each of the identified institutions. Criteria for identifying and sampling respondents within each institution will be developed (Chapter 5)
5. Analyze the results and produce a report on the process and performance of decentralization for water management in the three studied countries, contrasting the results and showing similarities and differences (Chapter 5)

Outcomes of above activities are presented and discussed in subsequent chapters as indicated against each.

CHAPTER 3: REVIEW OF INSTITUTIONAL DEVELOPMENT AND CHALLENGES FACING DECENTRALIZATION OF WATER MANAGEMENT WITHIN THE INKOMATI RIVER BASIN

3.1 INTRODUCTION

This chapter presents results of the first activity of the expanded Phase I of the WRC study following the WRC-RG recommendations discussed at the end of Chapter 2, which is to review institutional development and challenges experienced within the Inkomati river basin (IRB). This will provide a platform and baseline for better understanding and development of suitable approaches and indicators to be used in implementing the remaining activities of the expanded Phase one of the WRC study. The chapter starts with a scoping review of progress in institutional development in the IRB. Challenges experienced in the water sector in the three countries (SA, Swaziland and Mozambique) sharing the IRB are then discussed. The final section derives conclusions and implications of the study.

3.2 INSTITUTIONAL AND POLICY CONTEXTS

This section reviews existing institutional and policy contexts to understand process gaps and challenges associated with implementing water governance decentralization in the IRB. The institutional context is established by reviewing the regional and national policies and legal framework, including institutions and strategies guiding implementation of the decentralization process in the basin. The study will accordingly identify WMIs that are currently operational in the three riparian states that share the IRB. This is expected to contribute toward improved understanding and identification of institutional challenges and process gaps experienced during implementation of the decentralization process.

This scoping study employed desktop literature review complemented by one-on-one interviews with selected representatives of WMIs that are active in the IRB and senior management within DWA. The interviews were also used to identify other institutions operating in the water sector in the basin and also assist with identifying potential performance indicators.

3.2.1 DEFINING WATER GOVERNANCE INSTITUTIONS AND ORGANIZATIONS

We defined institutions and organisations for the purposes of this study in Chapter 2 from a river basin management perspective. The online Global Water Partnership (GWP) Toolbox defines river basin organizations (RBOs) as ‘’specialized organizations set up by political authorities, or in response to stakeholder demands……. to deal with the water resource management issues in a river basin, a lake basin, or across an important aquifer” (http://www.gwp.org/en/ToolBox/). The issues that RBOs may deal with are various, ranging from water allocation, resource planning and management, to education of basin stakeholders on IWRM, developing natural resources management strategies and programs of remediation of degraded lands and waterways (GWP, 2000). RBOs may also play a role in consensus building, facilitation and conflict management. Clearly this is a generic definition capturing all possible WMIs responsible for managing water resources at regional/ national and local

levels, including trans-boundary RBOs. However, implementation of these functions may take place at various levels such that the definition of water governance institutions takes cognisance of the international/ regional, national and local nature of RBOs.

Trans-boundary RBOs are aimed at improving IWRM and water governance at international level with a cross-boundary operational scope (waterwiki.net/index.php/river basin organizations). RBOs at this level give practical meaning to treaties that were historically aimed at managing shared rivers, and effectively represent centralized governance of water through riparian representation. Such RBOs vary in terms of type and function in accordance with the political context, the water resources challenges and the cultural features of the basin area (GWP, 2000). In addition to the trans-boundary RBOs Priscoli (undated) identifies regional RBOs orientated to the community with clear accountability lines among various actors; and a central knowledge and technical base to support its operations. These are decentralized water governance institutions that facilitate and encourage localized decision making. In particular, the role of water users in making decisions that impact on how water is allocated and used by various users.

In addition to the two forms of RBOs referred to above, another level of decentralization has a primary focus on localized involvement of stakeholders in water management. Makurira et al. (2003) refers to such structures that are operational in Zimbabwe as sub-catchment councils, equivalent to WUAs in SA, and basin water sub-offices in Tanzania (Sokile et al., 2005). In America such water management structures are referred to as watershed councils (Priscoli, undated).

It is clear from the above that RBOs may be trans-boundary, crossing borders of a number of states thereby performing water resource management functions that serve the interests of riparian states. Within specific countries, they can be national or regional, performing in-country integrated water resources management (WRM) functions, or localised focusing on sub-basin watersheds to manage water needs of represented private and public stakeholders as part of an IWRM framework. Examples of these types of statutory WMIs are found in a number of countries in Africa, including CMAs in SA, catchment councils in Zimbabwe, and ARAs in Tanzania and Mozambique. In various countries however, there might be a slight difference in terms of structure, functions and constitution of these institutions (Table 3.1).

Table 3.1: General characteristics of river basin organizations

Characteristics	Trans-boundary RBO	Regional RBO	Sub-catchment structure
Geographic scope	International scope between one or two countries	Focus on catchment level planning and operations	Localized sub-catchment focus
Levels of authority	Powers and mandate	Powers and mandate	May have statutory powers
Participation	State to state relationship, centralized	Water users involved as key stakeholders, de-centralized	Community / interest group/ sector involvement
Legal and policy framework	Treaty/ international agreement	National legal framework	Formal / informal
Issues/ service addressed	Basin-wide, multiple (IWRM) issues	Multiple IWRM issues	Water allocation and use, pollution control
Drivers for establishment	Water scarcity, droughts, floods, fragmented planning IWRM etc.	Water scarcity, droughts, floods, stakeholder involvement, fragmented planning IWRM etc.	Stakeholder involvement, water use

In addition to characteristics tabulated above other authors (Mostert, 1998) have differentiated between types of RBOs based on hydrological, administrative and coordinated models. The hydrological model implies that IWRM is done on the bases of hydrological boundaries with extensive basin-wide planning taking place. While in the administrative model water management becomes part of environmental management and is conducted by entities operating on administrative boundaries (such as provinces and municipalities). Regional and sub-catchment RBOs indicated in the table above fall within this administrative model of water management. While trans-boundary RBOs on the other hand, are likely to fall within the hydrological model. According to Mostert (1998) the coordinated model is an intermediary between the hydrological and administrative models. In this case river basin commissions may be established, that have a coordinating role.

3.2.2 OVERVIEW OF THE INKOMATI RIVER BASIN

A. LOCATION OF THE BASIN

The IRB is located in the north-eastern part of SA. It is an international basin shared between SA, Swaziland and Moçambique. The basin covers an estimated land area of about 46,700 square kilometres roughly occupying 2,500 square kilometres of the Kingdom of Swaziland, 15,600 square kilometres of the Republic of Moçambique, and 28,600 square kilometres of the Republic of SA (Carmo Vas and van der Zaag, 2003; Zaikowski, 2007). The Komati River rises in SA, flows into Swaziland and re-enters SA (DWAF, 2004) before converging with the Crocodile river at the SA/ Moçambique border, and then flowing into Moçambique (Basson et al., 2003). Several rivers form part of the IRB, with Sabie/Sand rivers, the Crocodile, the Komati rivers and the Uaneste rivers being the main tributaries flowing through the Kruger National Park into Moçambique (DWAF, 2004).

Although the IRB area covers three states, according to Basson et al. (2003) its dominant portion of the mean annual runoff originates in SA. The authors also mention that water resource management in both SA and Swaziland directly impact the river flow into Moçambique. For this reason, numerous bilateral and trilateral agreements have been signed by the three states.

The water laws of each country and the various international agreements are summarised and discussed in the following sections to illustrate the dual approach (individual – states applying their own internal laws, and collective – states entering into agreements to manage the basin) prevalent in the IRB to develop and manage the water resources in the basin.

B. STRATEGIC DRIVERS IN THE BASIN

In scoping the institutional arrangements currently operational in the IRB, it is important for one to consider fully the scope of institutions that exist, from trans-boundary level through to the national and local levels. As noted in the previous section, water resource management in the basin is given effect at these various levels and largely through the various national policies, legislation and strategies that give effect to institutions within each country. Therefore, institutional arrangements need to be understood against the various institutional roles and responsibilities, the area of jurisdiction within which they operate, and the legal basis which underpins this. In addition, the assumption is often made that all RBOs proposed by the various acts in the three riparian states have been established and are fully operational, while in reality, only a few RBOs have been established in the IRB. The following subsection considers in a summary form, critical socio-economic development drivers in each riparian state of the IRB.

STRATEGIC DRIVERS FOR MOZAMBIQUE

Among the most critical drivers for Moçambique is the continued growth of Maputo region and the subsequent increase in water demand. Specific development drivers include increasing water demands for irrigation, hydropower generation and water supply and sanitation. These developments clearly require support through water resource developments as well as improved water resource management to improve water security. To achieve this, at a national scale, Moçambique has developed a National Vision and Strategies (Visão e Estratégias da Nação – NV&S) for Agenda 2025 that was approved in December 2004. The NV&S aim to achieve a widely shared economic growth and improvement in living conditions throughout the country. The NV&S provide a comprehensive framework in which action plans for poverty alleviation can be integrated into the medium term Action Plan for the Reduction of Absolute Poverty (PARPA) and other Government plans such as the Government's Five Year Plan together with its implementing instruments, the annual Economic and Social Plan and the State Budget (medium term rolling three year budget, and annual budget). To complement the NV&S, the World Bank through the Country Water Resources Assistance Strategy (CWRAS) provides an enabling environment to Moçambique by prioritising water resources interventions. The CWRAS builds on the Poverty Reduction Support Strategy that recognizes the importance of water resources for the country's economic development and poverty reduction. Water related issues have received considerable attention in the national Second Poverty Reduction Support Strategy – PARPAII

(World Bank, 2007). Priority actions identified in PARPA II include: the implementation of effective rural development programs, the minimization of the negative impacts of climate variability, ensuring the sustainability of water supply services and the availability of water for agricultural production (World Bank, 2007). In particular, the focus is on development at district level, creation of a favourable environment for growth in productive sectors nationally, including improvements to the financial system and growth of small and medium sized enterprises as well as greater efficiency in increasing government income and its budgetary allocation.

STRATEGIC DRIVERS FOR SOUTH AFRICA

The South African economy in the IRB is largely driven by large scale commercial agriculture, forestry, and related industries, as well as some mining activities. Most importantly, the transfer of water out of the basin to support power generation in the Olifants catchment is a strategic requirement. Tourism in this water management area is significant and the effect of environmental management options and Reserve determination decisions can have significant impact on available water resources. Water plays a critical role in the economy of the region, and the fact that water resources are becoming increasingly constrained will certainly hinder development trajectories. This will require an increasingly innovative approach to water resource management that goes beyond pure resource development. While the bulk of the water is used for large scale irrigation, policy direction is geared towards developing smallholder irrigation and similar projects, designed to remedy structural inequities. At the same time, a careful balance should be struck between the needs of large-scale agriculture and forestry, the needs of the rural poor and the need to protect the environment (which has major potential tourism benefits).

STRATEGIC DRIVERS FOR SWAZILAND

Swaziland's economy is dependent on the water resources of the IRB. While tourism, industry and forestry are important economic sectors, in the agricultural sector sugar cane is a dominant water user, employer and drives the economy of the farming areas. The National Development Strategy (NDS) of Swaziland intends to formulate a Vision and Mission Statement with appropriate strategies for socioeconomic development for the next 25 years and to provide a guide for the formulation of development plans and for the equitable allocation of natural resources. Social development initiatives, such as poverty eradication and food security, human settlements and shelter, safe water and sanitation, health and human capital development, social security, gender issues are at the very heart of government policy in Swaziland. The development of a vigorous economy, the efficient utilisation of natural resources, and the development of infrastructure, research, and innovation are also key drivers (Government of Swaziland, 1999; Manyatsi and Brown, 2009).

3.2.3 TRANS-BOUNDARY WATER AGREEMENTS AND INSTITUTIONS

A. REGIONAL AGREEMENTS AND STRATEGIES

Trans-boundary agreements have been strengthened through the signing of supporting regional agreements. These regional agreements exist at two levels with an overarching framework, such as the SADC Treaty that establishes the normative principles for

cooperation across various domains. Under this framework more focused water and environmental agreements, policy and strategy serve to further strengthen the trans-boundary agreements that are put in place. In the SADC region increasing stresses on water resources due to uneven distribution, climate variability, and the need to support social and economic development, is exacerbated by institutional capacity and financial constraints. Given these challenges the SADC created policy platforms to foster cooperation and consultation, as well as support some form of policy harmonisation by states in the region. Key regional policies and strategies are briefly discussed below that provide the legal bases and guide the process to establish regional and trans-boundary water management institutions (WMIs) as a means to address some of the challenges mentioned here (TPTC, 2010).

REVISED PROTOCOL ON SHARED WATERCOURSES IN SADC

The Revised Protocol is based on the UN Convention and seeks to promote and facilitate the establishment of agreements and institutions for the management of shared Watercourses, Art. 2(a) (SADC, 2000). The principles that apply are basically those found in the UN Convention. Its overall objectives are to foster closer cooperation for judicious, sustainable and coordinated management; protection and utilization of shared watercourses and advance the SADC agenda of regional integration and poverty alleviation. In order to achieve these objectives, the protocol seeks to (SADC, 2000):

- Promote and facilitate the establishment of Shared Watercourse Agreements and Shared Watercourse Institutions for the management of shared watercourses.
- Advance the sustainable, equitable and reasonable utilization of the shared watercourses.
- Promote a coordinated and integrated environmentally sound development and management of shared watercourses.
- Promote the harmonization and monitoring of legislation and policies for planning, development, conservation, protection of shared watercourses, and allocation of the resources.
- Promote research and technology development, information exchange, capacity building, and the application of appropriate technologies in shared watercourses management.

Regional Agreements do tend to provide for context and uniqueness, and therefore, the Revised SADC Protocol emphasizes the unique features of the region and the needs regarding “regional integration and poverty relief.” (SADC, 2000)

REGIONAL WATER POLICY

The regional policy (SADC, 2005) follows pronouncements made by the SADC member states over the years, including the SADC Declaration in August 1992, and the SADC Treaty in September 1993, the Southern African Vision for Water, Life and Environment in March 2000, as well as the Dublin Principles. The regional policy framework emphasises nine thematic areas that holistically provide for the scope of IWRM in the region. These are:

- Regional cooperation in WRM,
- Water for development and poverty reduction,

- Water for environmental sustainability,
- Security from water related disasters
- Water resources information and management
- Water resources development and management
- Regional water resources institutional framework
- Stakeholder participation and capacity building
- Financing integrated water resource management in the Region (SADC, 2004)

At a regional level, the IWRM role falls within the ambit of the SADC Water Division. The role of this regional institution is to create a common understanding of issues and imperatives related to water resource management, and to provide the platforms for useful discourse around these issues. This policy therefore provides framework at both national and trans-boundary levels, emphasising the importance of integrated river basin management to achieve closer coordination. To achieve such coordination, regional water strategy and harmonised policies and strategies at national and trans-boundary level are also critical.

REGIONAL STRATEGIC ACTION PLAN FOR INTEGRATED WATER RESOURCE DEVELOPMENT AND MANAGEMENT (IWRDM)

The RSAP – IWRDM (SADC, 1998; SADC, 2005; SADC, 2011) promotes an integrated approach to water resources development and management and recognises the role of water as a key catalyst for sustainable growth and development. The initial RSAP-IWRM had 31 priority projects and was aimed at creating an enabling environment for IWRM. A review in 2004 lead to the rationalisation of the plan into four key thematic clusters, with a number projects aimed at implementation of the strategic objectives under each. These are water resources development planning and management, infrastructure development, water governance and capacity building themes.

Since the inception of the RASP-IWRM action plan, a number of challenges have been experienced in implementing the RSAP-IWRM, which included capacity constraints to accelerate and develop basin strategies, the harmonization of programmes and projects, difficulties with monitoring and evaluation, plus disparities in economic development amongst Member States, issues relating to sovereignty as opposed to the concept of regional beneficiation, and establishing representative stakeholder participation. Reviews of the RSAP have been initiated over time and has led to progressive development of the plans to meet current needs with RSAP III (SADC, 2011) being the most recently reviewed plan

REGIONAL INDICATIVE STRATEGIC DEVELOPMENT PLAN-RISDP (SADC, 2004)

Recognising that cooperation and integration between member states is fraught with a variety of challenges, the RISDP was developed to create a stronger alignment in priorities and through the development of policies and strategies that a more meaningful level of regional integration can be achieved, so as to attain the overarching goals of SADC. In brief the aims of RISDP are to (SADC, 2004):

- Review the main cooperation and integration areas;
- Define the priority integration areas for the next fifteen years;
- Set up a logical implementation program of the main activities necessary for the achievement of the regions broader goals;
- Ensure effective sectoral linkages and enhance synergy amongst sectors;
- Provide member states, SADC Secretariat and other institutions, regional and international stakeholders with coherent and comprehensive long term implementation agenda.

Whilst water is not explicitly mentioned within this plan it is a central and cross-cutting theme that weaves throughout the objectives and targets that are set. The Regional Strategic Water Infrastructure Development Program must be understood within the context of the RISDP.

REGIONAL STRATEGIC WATER INFRASTRUCTURE DEVELOPMENT PROGRAM (RSWIDP)

The RSWIDP is a SADC initiative towards projects that are water infrastructure related, that have definable poverty elimination elements with regional implications (SADC, 2006). This program fundamentally recognizes that water and related infrastructure plays a key role in socio-economic development. Therefore, this must be seen as complimenting the RSAP-IWRM. A number of bankable projects have been initiated under this program, which include the Movene Dam.

While water resource management in the three basin states is governed by respective in-country water policies and legislation, these water policies and laws have been harmonized with the Regional Water Policy (SADC, 2005) and aligned to the Regional Water Strategy (SADC, 2006). In this respect all represented countries are signatories to the SADC Protocol and the Regional Policy on Water which provides the legal basis to regulate water resource management issues in the region and how the water in trans-boundary river basins is shared.

TRANS-BOUNDARY AGREEMENTS

Over time there have been a number of multilateral and bilateral trans-boundary agreements established in the IRB in order to develop water resources, to effect joint water management, and/or to establish institutional arrangements. Some of these agreements have localised and issue-specific focus (on a variety of water resources and infrastructure concerns) whilst others have basin-wide integrated management focus. In many instances there is a complex array of agreements within any given basin creating various uncertainties and institutional challenges. However, where there is a single purpose agreement this has provided the basis for wider cooperation (DfID and WWF, 2010). A high level summary of the relevant trilateral and bilateral agreements is presented below:

TRILATERAL AGREEMENTS

As a result of increasing pressures being placed upon the water resources of the Inco-Maputo basin, the governments of Moçambique, SA and Swaziland signed an agreement to form tripartite technical committee (TPTC) in 1983. The agreement was ostensibly aimed at

addressing water shortages on the rivers of common interest, considering the existing storage capacities and the water requirements in each country. The Agreement established the TPTC as the technical advisory body with the function to make recommendations to the three governments with respect to water management issues (TPTC, 2008). The recommendations of the TPTC were accepted and agreed upon by the three ministers responsible for water in the three states concerned. The agreement recognises that in order to sustainably manage resources that the three parties need to work together such that any planned water resources development projects and water utilization projects (whether or not listed in Annex II "Reference Projects"), shall not commence if they, by themselves or in combination with existing projects, have the potential of a significant trans-boundary impact on the watercourse. It is also noted that these projects may only commence if the provisions of Article 4(1) of the revised SADC Protocol, on the procedure of notifying other riparian countries of planned measures, have been complied with (SADC, 2000).

BILATERAL AGREEMENTS

In 1992 the governments of Swaziland and SA signed the Bilateral Treaty on the establishment of the Joint Water Commission. The treaty enables joint water project development and management in the IRB. In addition, the Commission advises the two countries on all technical matters relating to the following (TPTC, 2008):

- Criteria to be adopted in the allocation of water between the two countries.
- Joint investigation in the development of water resources of common interest including the construction, operation and maintenance of any waterworks.
- The prevention and exercise of control over the pollution of water resources of common interest.

In July 2010, SA and Swaziland signed another agreement that aims to facilitate cross border water supply between the two countries. This agreement provides more practical obligations so that parties can enter into necessary contractual arrangements, can obtain the required servitudes, as well as arrangements that support the construction, operations and maintenance of cross border supply systems. Reporting in this regard is to be through the Joint Water Commission (TPTC, 2008).

In 1996, the Governments of Moçambique and SA signed a bilateral agreement on the 'Establishment and Functioning of the Joint Water Commission Concerning Water Resources of Common Interest Between the government of the Republic of Moçambique and the government of the Republic of SA'. The Commission acts as technical adviser to the two governments on all technical matters relating to the development and utilization of water resources of common interest. In 1999 an agreement was signed between Moçambique and Swaziland that established a Joint Water Commission that, as with other Commissions provides technical advice to the respective Governments. In this instance, this Commission deals largely with issues relating to the shared Umbeluzi River (TPTC, 2010).

TRANS-BOUNDARY WMIS

DFID and WWF (2010) identify four distinct types of WMIs that are not mutually exclusive and that practically reflect the types of trans-boundary agreements that are observed:

- *Water (basin) infrastructure authorities:* Established under a treaty between the parties for the development, financing and/or operation of joint water resources infrastructure (WRI) between two of more countries. An example of such an institution in the IRB is Komati Basin Water Authority, established by a treaty signed between SA and Swaziland to develop and manage water resource infrastructure.
- *Bilateral issue based bodies:* Established under agreement between two countries to engage water issues of common concern, such as water sharing, infrastructure planning, aquifer management, hydropower, water quality and/or flooding. A number of joint water commissions that exist in the IRB are worth mentioning here (Table 3.2).
- *Multi-lateral basin committees:* This is a technical committee, such as the TPTC, established under agreement to advise the parties on a range of trans-boundary water management issues and priorities, including the development of a basin agreement/plan concerning the allocation of water, trans-boundary objectives and institutions to be established to foster cooperation in the basin.
- *Multi-lateral basin organisations:* This is a basin institution established with a permanent secretariat by trans-boundary agreement, in order to advise the parties on water resources related issues of common concern at a trans-boundary level (DfID and WWF, 2010).

The states of the IRB have also established a few WMIs to operate and /or give advice on integrated water resource issues. It must be noted however, that some of the agreements were signed prior to the Revised Protocol coming into effect. The table below provides a summary of some of the institutions that have been established in the basin so far.

Table 3.2: Summary of trans-boundary institution in the IRB

Institution	Responsibility
Joint Water Commission (JWC)	Provides a technical forum for Swaziland and SA to discuss and advise the two Governments regarding resource allocations, resource development and infrastructure constructions, operations and maintenance, and the prevention and control of pollution.
	Provides a technical forum to advise the two Governments of Moçambique and SA on technical matters relating to the development and utilisation of water resources of common interest.
	Provides a technical forum to advise the Governments of Moçambique and Swaziland on technical matters relating to the development and utilisation of water resources of common interest, especially the Umbeluzi
Tripartite Permanent Technical Committee (TPTC)	Provides a technical advisory role with the function to make recommendations to the three Governments of Moçambique, SA and Swaziland regarding various water management issues.
Komati River Basin Authority (KOBWA)	Implements Phase 1 of the Komati River Basin Development Project. Phase 1 comprises the design, construction, operation and maintenance of the Driekoppies Dam in SA (Phase 1a) and the Maguga Dam in Swaziland (Phase 1b).
Inkomati System Operation Task Group (ISOTG)	The Tripartite Technical Committee (TPTC) sets up the Inkomati System Operation Task Group (ISOTG) to recommend operating rules for the Incomati River Basin with the Komati River basin as priority

This scoping review focuses on the river basin organizations that operate internally in the three riparian states that were established as part of the decentralization process. The summary of regional and trans-boundary policy, legislation and the types of institutions discussed above provides a backdrop for a brief analysis of the national water laws and institutions that are in place in each riparian state.

3.2.4 WATER RESOURCE GOVERNANCE AT NATIONAL LEVEL

International agreements and conventions need to be given effect through national legislation. The water laws in the three countries recognize both the need for international cooperation and integrated management, and the need to decentralize decision making in water resource management in the basin. This way the regional and international perspectives on water resource management are integrated in national legislation.

The water governance decentralization process in the IRB has however taken place overtime, and can be traced back to the beginning of the 1990s, when both the Moçambique Water Act (DNA, 1991) and the SA NWA – Act 36 of 1998 (RSA, 1998) were promulgated. These were followed in 2003 by the Swaziland Water Act – Act No 7 of 2003 (Government of Swaziland, 2003). These three pieces of water law call for in-country decentralization of water resource management that includes representatives of various water user groups. In SA these are CMAs established in terms of Chapter 7 of the NWA, and WUAs that are established in terms of Part 4 of Schedule 4 of the NWA. The NWA serves as a guide to establish these institutions, and therefore it does not set specific timelines for the establishment of these institutions. Naturally movement towards establishing the targeted institutions in each WMA has been very slow and has inevitably resulted in a review of the viability of the 19 proposed CMAs. This review has resulted in the number of CMA reduced to 9. Both the CMAs and WUAs are inclusive and stakeholder based statutory institutions tasked with the IWRM responsibility at a broader water management area level (CMAs) and at a local level (WUAs).

The Swaziland Water Act (Government of Swaziland, 2003) establishes a NWA (Part II), the Water Apportionment Board – WAB (Part IV) and River Basin Authorities – RBA (Part IV, Section 33 – 1 to 9), all with different roles, powers and functions related to integrated water resource management. Effectively this water law decentralizes water governance and management responsibilities to the lowest level. Currently, the WAB is the responsible authority managing water on behalf of the RBA pending their establishment, at the same time the process to establish the NWA is still work in progress. However, other reports (see Encyclopedia of Earth) indicate that water resources management in Swaziland is done on an ad hoc basis through several pieces of legislation, spread among a number of Ministries as well as other institutions outside the government, that are aimed at solving specific issues. These Acts include the Protection of Freshwater Fish Act of 1938, the Swaziland Electricity Act of 1963, the Water Act of 1967, the Water Services Act of 1992, the Komati River Basin Water Resources Development and Utilization Act of 1992, the Joint Water Commission Act of 1992, the Swaziland Environmental Authority Act of 1992, the Swaziland Administrative Order of 1998 and the Borehole Act of the Geological Surveys and Mines, to name a few.

The Swaziland WA of 2003 is an attempt to harmonize and integrate these various pieces of legislation.

The National Water Policy (NWP) of Moçambique was published in 1995. It was revised in 2007 (Government of Moçambique, 2007; Magaia, 2009) and has taken into consideration elements of the SADC Regional Water Policy and key IWRM principles. The Water Law of Moçambique (DNA, 1991) creates regional water authorities that have a mandate to perform water resource management of rivers having a basin as a single unit. This are called Regional Water Administrations (ARAs). Their responsibility mainly entails regional WRM. Currently however, the National Directorate of Water performs most of the water resource management functions, especially where the proposed regional WMIs are yet to be established. So far the decentralisation process has experienced slow progress with additional financial support still required to sustain the establishment of all regional water authorities. The key water legislations applicable in the three states are summarised in Table 3.3 below.

3.2.5 WATER MANAGEMENT INSTITUTIONS AT NATIONAL LEVEL

A useful point of departure for this initial institutional scoping is to recognise that there are a plethora of government departments, institutions and stakeholders that have an impact upon, or role, with regards to water management. Many of these are use, supply or services oriented. For the purposes of understanding the decentralisation process, this review focuses on those structures that have a very direct responsibility to manage water resources within each country. It must be noted that the full institutional framework for water, including water services and various water use actors becomes immensely complex in most instances, and detracts from the direct and real challenges being faced during the decentralisation process.

Moçambique: In terms of the policy, The National Water Council is the body that defines water policy whilst the DNA, as part of the Department of Public Works and Housing, is responsible for planning, regulatory and monitoring functions (Table 3.4). New regional, basin and local institutions are being established to manage water resources. Regional water administration agencies (ARAs) have been established and ARA-SUL is operational and is responsible for a suite of WRM and related functions including operation and maintenance of dams, monitoring, flood management, and water use licensing. UGBs are being established to manage water resources at a catchment scale. In order to create a more participative environment River basin management committees (CGBs) are being established as consultative bodies to work with the UGBs, and consist of government representatives, water users and representatives of civil society (TPTC, 2008; GWP, 2009).

There are four Basin Management Units (UGBs) under the ARA-Sul' area of jurisdiction that fall within the three provinces of Maputo, Gaza and Inhambane. These UGB's are the Limpopo Basin Management Unit operating in Gaza Macaretane, the Umbeluzi Basin Management Unit operating at Pequenos Libombos, the Save Basin Management Unit that operates at Maxixe in Inhambane province, and finally the IRB Management Unit operating at Corumana dam in Maputo province. At the time of writing this report, information on progress to establish the basin management units in ARA-Centro, ARA-Centro-Notre, and ARA-Zambeze was pending. However, localised water users can establish river basin

committees, although these have no direct management and operational responsibilities, except to facilitate stakeholders' involvement.

Table 3.3: Key water legislations in the IRB countries

Country	Legislation	Policy	Regulations	Challenges Overview
Moçambique	**Water Law (Act 16/1991)** The Water Law is more directed towards water supply than to WRM. The Water Law defines basically three main components of WRM, namely the: • Water Resources and Demand Inventory; • Water Registry; and • Water Development Plan.	**National Water Policy (1995)** The policy incorporates principles of Integrated WRM (IWRM). Lays the basis for equitable water allocation in that consideration is given to optimum and beneficial use of water. National Water Resource Strategy (2007) developed	Regulations on Licenses and Concessions for water use makes a distinction between two uses, namely Common Use and Private Use.	• Need for improved awareness and participation; • Need for improved capacity at institutional level; • Environmental flows not sufficiently mandated; • Groundwater management aspects not sufficient; • Water conservation and demand management not reflected.
SA	**NWA (Act 36/1998)** Focused upon IWRM and sustainable management as well as a strong focus upon transformation and redress. Enabling legislation.	**National Water Policy for SA (1997)** As the basis for legislation articulated a move towards IWRM, sustainable management, decentralised institutions, transformation and redress. National Water Resource Strategy (2004) set the framework for management of national resources. Recent shift towards Water for Growth and Development has been fundamental.	Various regulatory elements, however, are disjointed and recent efforts have been to establish a holistic regulatory framework.	• Key transformational aspects of policy and law have proven problematic to implement. • Implementation delays significant. • National Water Resource Strategy under review • Institutional impasses have, and are, creating increasing array of challenges that hamper implementation of law and policy.
Swaziland	**Water Act (Act 7/2003)** Sets out the framework for water use authorisations and allocations. Sets out institutional frameworks.	**National Water Policy** Being formulated. Host of related strategies such Swaziland Environmental Action Plan, 1997 and the National Development Strategy, 1999.	Still to be developed.	• Key NWP needed. • Regulation gap prevents real enforcement of law. • RBA still to be fully established. • Institutional capacity challenges are significant.

A central theme for this decentralisation is to create a more participative environment so that water users and stakeholders can provide localised inputs into WRM. However, indications are that at this stage this has been difficult in the sense that there is a lack of awareness, capacity and a lack of a sense that stakeholders can make meaningful input into WRM. It appears that much has to be done by the local institutions, over time, to create the necessary capacity and trust (GWP, 2009).

Table 3.4: Summary of WMIs established in terms of the Water Law

Institution	Responsibility	Discussion
National Water Council	A multi-sectoral institution, created as a coordinating and consulting body to inform the Council of Ministers on the most relevant issues related to water management policies.	
Ministry of Public Works and Housing (National Directorate for Water (DNA))	Sets policy frameworks and oversees implementation. • Promote the best use of the nation's water resources; • Propose the policies for the development of water resources and implement them; • Promote the inventories of water resources and water demand and its balance at the national and river basin levels, establishing and operating a related and adequate information system; and • Regulate the use of the water resource	Representatives on TPTC. Not clear as to how these members engage with water resource management up and down the various levels and between structures.
ARA-Sul	ARAs responsible for water development planning and management at regional level. Responsible for establishing river basin management units (UGBs) Approval of licenses and water use.	Capacity and financial constraints appear significant. Well positioned to discuss regional to local water resource management and operations, but not mandated.
River Basin Management Units (UGBs)	Localised water resource management. Advise and support ARA-Sul in water use and license requests. Collection of regional hydrometric data to support, planning and management	Established but face capacity challenges. Lack of guidelines and funds Incomati: UGB responsible for the Incomati basin. Ideally placed to liaise with CMAs and RBA in SA and Swaziland on operational matters.
River Basin Committees (CGBs)	Engagement and participation of stakeholders in water resource management. Inputs into operational plans and budgetary requirements of UGBs	Capacity challenges. Stakeholder inertia and reticence. Are instances where international stakeholder participation could prove useful, however, issues of sovereignty makes these processes challenging.

Swaziland: As with Moçambique and SA, Swaziland initiated a process to decentralise water resource management functions and to create a more participatory environment. Possibly less water constrained, in Swaziland many of the challenges relate to water services and supply. However, it has been noted that Swaziland also needs to manage resources carefully and has therefore, started to establish decentralised institutions. Swaziland has just completed its final

draft of the NWP where it clearly states the intention to establish institutions to decentralise responsibility and to enable stakeholder engagement (GWP, 2009).

The Swaziland Water Act establishes a National Water Authority (NWA) which comprises of government officials as well as representatives from key stakeholder groups. Broadly, the Authority has a full complement of water resource management functions including that of planning, policy and making recommendations on regulations, considerations and recommendations regarding the findings of the JWC and TPTC, oversight over the RBA, approval of resource development projects, and information management. It is unclear as to who oversees the NWA.

The WAB was established by virtue of the Water Act as an essential, but temporal measure to ensure continued WRM functionality whilst the RBA are being established and capacitated. Essentially, the WAB has the functions of the RBA in terms of authorising and enforcing the conditions of water use permits, as well as having the function to inspect the construction, operations and maintenance of water works and dams, as well as that of dam safety (Table 3.5).

RBA have now been established in the Usutu and Komati basins, but these institutions are still in their infancy and are under-resourced with limited capacity (GWP; 2009). Hence, the WAB is still responsible for the basin functions. This can create some institutional dilemmas with regards to roles and responsibilities, and whilst there is limited capacity this can create either overlaps or gaps in decision making.

The Ministry of Natural Resources and Energy is responsible for assessment, management, allocation and monitoring of water resources. Within the Ministry, the Water Resource Branch is responsible for the management of Swaziland's water resources and includes the planning, apportionment, and information management functions. Importantly, the DWA plays a secretariat role for the NWA and are a conduit for inputs to the Minister.

South Africa: The National Water Resource Strategy sets the framework for managing water resources in terms of water management areas, according to hydrological boundaries. The Inkomati Catchment Management Agency (ICMA) and the Breede-Overberg Catchment Management Agency (BOCMA) were established and are operational with gazetted catchment management strategies. The function of these two agencies in the first instance, as set out in the NWA is to advise on WRM issues, including water use authorisations, the development and implementation of catchment management strategies, to coordinate with all institutions and to facilitate stakeholder engagement (Table 3.6).

Table 3.5: Summary of WMIs established in terms of the NWA in Swaziland

Institution	Responsibility	Discussion
Ministry of Natural Resources and Energy (MNRE) (Water Resources Branch	Responsible for stream flow observation, planning of water resources and control of pollution. Also for determining, apportioning, development and management of the country's surface water bodies and is the custodian of the Water Act.	Appears still very supply oriented. Poor coordination between units and functional areas. Representatives on TPTC. Not clear as to how these members engage with water resource management up and down the various levels and between structures.
NWA	Prepare Water Resources Master Plan. Advise the Minister on policy and regulations. Review and consider recommendations from JWC and TPTC, and make recommendations to the Minister. Oversee the RBA. Approval of resource development projects Ensure Information management.	
WAB	Approval of applications for a abstraction permit or effluent control permit. To amend or cancel permits. To perform inspections and enforce permit conditions Inspection of waterworks and dam safety	Essentially an interim measure until all five RBA are established.
RBA	Responsible for water resource management at a basin level. Issue water permits Information management Impose restrictions Investigate needs for resource development Authority over Irrigation Districts, Project Boards and User Associations	Recently established. Will be well positioned to interact with Inkomati CMA and the Mozambican ARA-Sul/ basin management units. However, do not have the mandate. The relevant authorities are the Usutu RBA and the Komati RBA
Irrigation Districts	Enforce permits and ensure conservation of water Collection of water use charges.	More formalised structure and responsibilities than water user associations
Water user associations	To manage localised water resources in accordance with permit conditions Enforce permit conditions	
Project Board	Established for new developments requiring new capital input or organization. Objective of the board shall include the construction and/or operation and/or distribution of water to permit holders With the consent of the Minister and the Minister of Finance, to borrow money.	Established by Minister, if recommended by the NWA, and in consultation with the relevant River Basin Authority

The NWA allows for the establishment of committees, however, these have not been formally established. The existing CMAs have established a number of catchment based forums in order to facilitate stakeholder engagement and these have played a meaningful role in the development of the first catchment management strategies. The CMAs have also established a number of WUAs, although most still exist on paper rather than as operational structures. The two already established CMAs are also playing a valuable role in advising on various water use issues. However, funding constraints, coupled with the uncertainty created by the institutional re-alignment process has stalled the ICMA's institutional development trajectory in particular, and this has also caused some loss of legitimacy within the water management area.

The DWA has over recent years moved towards the development of firmer regulatory environment and removed dilemmas relating to conflicts of interest in terms of setting policy, regulating and developing the resource. This has resulted in the Department establishing a National WRI Branch, a Water Trading Entity and now moves towards the establishment of a regulatory Branch. These shifts have created some instability and cooperative government arrangements, which are mandated in the Constitution, have faltered.

Table 3.6: Summary of WMIs established in terms of the NWA in South Africa

Institution	Responsibility	Discussion
DWA	National level establishment of water resource management policy and regulate implementation.	Functional aspects between National Office, Regional Office and CMA (see below) still disjointed, particularly between Regional Office and CMA. Representatives on TPTC. Not clear as to how these members engage with water resource management up and down the various levels and between structures.
Inkomati Catchment Management Agency	Water resource management in the Inkomati WMA	Limited delegation of functions to date. Financial constraints. Has interacted with international partners such that, amongst other issues, the Catchment Management Strategy process involves these states. Has also involved them in Business Plan processes. No mandate to interact with other WRM structures in Moçambique and Swaziland.
Water User Associations	Localised water resource management and operations and maintenance of infrastructure.	Transformational issues remain a challenge. Implementation and billing agent agreements outstanding too. Localised interactions and inputs are really important especially where they are in close proximity to the international borders. No mandate to interact with international counterparts on water resource management issues.
Catchment Management Forums/ Committees	Localised participation and stakeholder engagement.	Few established and operational. Keeping these functioning has proven difficult. Issues include keeping stakeholders interested, getting poorer groups to meetings, empowerment differentials, and finances. Forums and Committees are instances where international stakeholder participation could prove useful, however, issues of sovereignty makes these processes challenging.

3.3 CHALLENGES FACING DECENTRALIZATION OF WATER GOVERNANCE IN THE IRB

3.3.1 PRELIMINARY ISSUES AND CHALLENGES

The slow pace of the decentralization process is a result of a variety of challenges experienced by WMIs in the three states. While most of these institutions are tasked with performing IWRM functions, the ability to perform these functions is dependent on a number of preliminary processes to support functioning of these WMIs. For the purpose of this review a selected number of processes and related challenges will be considered to determine the extent of success of the decentralization process. At this early stage of the performance review process, the

challenges identified are based on literature review and will be confirmed through interviews with selected managers in the basin. Some of these challenges are listed below, and reflect comments related to the regional (SADC) and the IRB context where information is available. While effective water governance is critical to managing water related challenges, the region is facing a number of governance related challenges in all three of the pillars of good water governance, namely: i) clear policy, legislation, strategy and instruments; ii) capacitated and effective bureaucracy; and iii) engaged civil society.

A. Political support. Lack of political appetite to decentralise is one of the major challenges facing the water sector. Poor relationships between central and regional authorities and the reluctance to implement real devolution in a bottom-up process has characterised the water reform processes in the IRB. Although policy, laws and guidelines are in place to support establishment and implementation of RBOs, often national and regional WMIs are reluctant to relinquish functions and related powers. Where this has been experienced political support has not been demonstrated. In SA for example, both the DWA Head Office and the Mpumalanga Regional Office of DWA have shown reluctance when it comes to transfer of functions and staff to the Inkomati CMA (Marcus Selepe; personal communication). This has also lead to lack of collaboration and effective communication between these two government institutions and the ICMA, regarding roles and responsibilities. Despite this there have been no political directives to guide the process and to ensure that the autonomy of the restructured and new institutions is entrenched. In Moçambique, one major constraint that hampers institutional capacity is a lack of strong leadership to guide the decentralisation process in the water sector.
B. Financial constraints. The issue of funding to support/sustain the decentralization process is critical and affects all three states in the IRB. While initial funding is provided to support the establishment of RBOs, such funding is limited to supporting the major RBOs with user associations left to fend for themselves. Where RBOs are established, lack of necessary powers and technical capacity derails implementation of the water resource management functions, making it difficult for RBOs to achieve financial autonomy. This is the case in SA, particularly in the IRB, where implementation of some water resource management functions such as water allocation and licensing requires that the ICMA is delegated not just the function but also the related powers. This means that the ICMA cannot achieve financial autonomy since the responsibility to administer water user charges resides within the DWA. In Moçambique, ARA-Sul and ARA-Centro regional water authorities are already functioning but require continuous support. The EU's support of ARA-Zambezi is scheduled to end in December 2007 (World Bank, 2007) and other support mechanisms need to be explored. In Swaziland the process to establish the RBA still needs to be completed and personal communication with Ms Sindi Mthimkhulu (2012) indicates that lack of seed funds are a major stumbling block.
C. Planning, coordination and monitoring. Coordination and alignment of strategies and plans is important to achieve IWRM. The objective is to achieve improved water management to

support the achievement of national social, environmental and economic goals. Deficiencies in the system in terms of poor co-ordination of policies, weak institutional arrangements, and the need for practical demonstrations of the benefits of IWRM through effective planning, monitoring and evaluation is critical. The review of the CMA establishment process by ten Brummelaar et al. (2009) indicates that the business planning process for the ICMA experienced a number of challenges. These include unforeseen delays due to absence of a business planning template and guiding documents from treasury, lack of synchronization with the DWA budgeting process, resulting in delays to transfer funds and delegation of powers and functions and staff. The lack of a structured co-ordination mechanism, supported by an effective communication plan, is a major shortcoming toward successful implementation of IWRM, in particular the roll-out of decentralized WMIs.

D. Institutional arrangements. All three countries in the IRB have reviewed the institutional arrangements for the implementation of IWRM. However, the process to establish these institutions seems to be too long and thereby hampering actual implementation of the IWRM framework. Moreover, managing water according to catchments or river basins means that the water management boundaries cut across existing administrative and political boundaries, creating overlapping jurisdictions and mandates, and making coordination across administrative boundaries essential and formidable (GWP, 2009). In some cases the creation of new institutions at the catchment level does not necessarily recognize the role of existing institutions (e.g. irrigation boards in the case of SA) which in terms of the new legislation are supposed to transform. Part of the challenge is to reconcile the new institutions with existing formal and informal institutions at the district, provincial, and central government levels. In Swaziland, except for the Komati river basin authority, other RBA proposed in terms of the Water Act have not been established due to lack of funding.

E. Human resources capacity. Lack of human resource capacity and skills to facilitate the establishment process, in particular in the national departments that are responsible for coordinating the decentralization impacts negatively on the process. A review document on lessons learnt compiled by ten Brummelaar et al. (2009) indicates that while secondment of personnel to the ICMA was delayed, it had a positive impact on the functioning of the CMA, since the ICMA was provided with an opportunity to appoint suitable staff. However, this also meant that the ICMA had to build capacity from scratch, and that key positions remain vacant due to lack of appropriate skills in the market. In Moçambique however, the DNA consequently finds it difficult to recruit staff and suffers from a capacity problem which is detrimental to the sector as a whole (World Bank, 2007). As a sector leader, the DNA finds itself overtaken by other decentralised institutions such as ARAs and the Fundo de Investimento e Patrimonio do Abastecimento de Agua (FIPAG) that have superior pay scales and employment benefits which are independent of the government public service (World Bank, 2007). This means that the sector leadership role that the DNA needs to play is compromised by lack of appropriate capacity. The Regional IWRM Report (GWP, 2009) indicates that capacity is weak in WMIs, and amongst stakeholders. In SA, this is exacerbated by a brain

drain of professionals to other countries. The study needs to explore these capacity issues further.

F. Trans-boundary basin management (versus in-country basin management): Most of the trans-boundary agreements that are in place in the IRB clearly incorporate the key principles of IWRM. However, the issue of equitable sharing of benefits between riparian states remains a challenge (GWP, 2009). Furthermore, in the absence of sufficient capacity to manage water resources effectively at a national and catchment levels, it is clear that difficulties will be experienced at international basin level. Despite this challenge, the water resource management role of the RBOs is critical to ensure that downstream water requirements are met, although often are outside the functional scope of the new institutions.

G. Stakeholder engagement. Appropriation/ownership by stakeholders of the new framework: One of the key roles of RBOs is to facilitate ownership of planning and decision making processes in order to achieve equitable access to water resources in the basins. However, in most cases equitable access requires reallocation of water to accommodate new users. This process sometimes results in stakeholders perceiving the role of RBOs as a means to take water away from them. This is especially so where stakeholders do not embrace the decentralization framework. At the same time where water users have different ideas on how to approach the decentralization process, authorities are not willing to change the approach to accommodate the local ideas. Nevertheless, stakeholders have a critical role to play in supporting the establishment process. Some authors have observed that there is clear evidence of greater awareness of IWRM among both stakeholders and decision makers (GWP, 2009). However, a challenge still exists to build an understanding of IWRM in other sectors in government, such as the economic and development planning sectors. The same authors acknowledge that financial constraints limit the extent of stakeholder participation in some countries due to long distances; poor transport and communication infrastructure also make stakeholder engagement and awareness building difficult (GWP, 2009).

Understanding the challenges identified and discussed above requires that a methodology with a set of indicators is developed and tested for implementation with the targeted RBOs in the three states in the IRB. It is worth mentioning that the list of challenges reflected above is by no means exhaustive, the process to test the performance indicators will provide the project team with an opportunity to identify additional challenges through direct interviews with relevant water managers in the basin.

3.4 SUMMARY OF FINDINGS AND WAY-FORWARD

The water resources of the IRB are shared between three basin states each of them has strategic social and economic development drivers that depend on the availability and equitable use of the water resources of the river. Mozambique for example is faced with continued growth of the Maputo region and the subsequent increase in demand for water for irrigation, hydropower generation and water supply and sanitation. SA also relies heavily on the IRB to meet its large

scale commercial agriculture, forestry, industry and hydropower generation, as well as mining activities. Similarly, Swaziland relies on the same water resources and its strategic drivers include tourism, industry, forestry, and agriculture to meet its social and economic development needs. However, it must also be noted that any water resource development planned and implemented by SA and Swaziland have a direct impact on the amount of water flowing into Mozambique.

Meeting the strategic development needs summarised above, clearly puts a lot of stress on the Inkomati water resources and requires that the three states harness water flows wisely to cater for these demands. To this effect, various bilateral and trilateral agreements have been put in place to facilitate the sharing of the water resources of the Inkomati. Some of the agreements have resulted in trans-boundary bilateral and tripartite committees and RBOs. Examples of these trans-boundary structures (committees and organisations) include water (basin) infrastructure authorities such as the Komati Basin Water Authority established under a treaty between SA and Swaziland to develop, finance and/or operate joint WRI between the two countries. Multi-lateral basin committees such as the tripartite technical committee (TPTC) have also been established under agreement to advise the parties on a range of trans-boundary water management issues and priorities, including the development of a basin agreement/plan concerning the allocation of water, trans-boundary objectives and institutions to be established to foster cooperation in the basin.

In addition to the trans-boundary structures, each of the three countries also has specific water laws that guide water governance and management at a country level. These laws follow an IWRM approach and are aligned to the SADC regional water policy, the SADC Protocol on the management of trans-boundary water resources and other regional and international laws developed to coordinate systematic development and management of water resources. Within each country these water laws guide the decentralisation process and give effect to the establishment of institutions to facilitate IWRM. While progress has been made to establish these WMIs, preliminary research indicates that this process continues to face several challenges, including:

- Political support and appetite for change.
- Financial constraints, in particular to support and sustain the decentralisation process.
- Planning, coordination and monitoring, including information management and reporting on the state of the water resources.
- Institutional arrangements and duplication of roles between the new institutions and the departments that have been responsible for the implementation of WRM in the basin.
- Human resource capacity, including lack of skills to guide the decentralisation process while at the same time facing the need to implement integrated WRM.
- Trans-boundary basin management, especially conflicting priorities among states and the need to meet strategic social and economic developments needs in the three countries.

- Stakeholder engagement and communication, in particular the need for extensive engagement and empowerment of water users, a process that requires significant financial resources to accomplish.

The most important challenge is the slow pace of the decentralisation process in the three basin states despite clearly defined water laws. There is certainly a need for more research work to verify and confirm the above identified preliminary challenges and propose options to improve the situation. Moreover, given the national drivers in each country and the trans-boundary arrangements summarised above, a number of questions need to be answered that relate to the role of decentralised WMIs in the basin to facilitate IWRM. Examples of the decentralised water management institutions are the ARA-Sul in Mozambique, Inkomati CMA in SA, and Komati River Basin Authority in Swaziland. A full list of institutions is to be compiled as part of undertaking the remaining project activities toward more comprehensive evaluation of the performance of these in-country water institutions and the progress they are making with regard to successful implementing of IWRM.

CHAPTER 4: REVIEW OF METHODS AND INDICATORS AND DEVELOPMENT OF A METHODOLOGY AND PROTOCOL FOR MONITORING PERFORMANCE OF DECENTRALIZING RIVER BASIN MANAGEMENT

4.1 INTRODUCTION

As indicated at the end of Chapter 2, the second activity and task in the expanded Phase I of the WRC study is to provide a review of existing indicators and develop an appropriate methodology and approach to assess performance of water management decentralization. This chapter presents a review of the literature on existing approaches and identifies indicators that are currently in use to measure the impact and assess performance of river basin management decentralization. The literature review serves the purpose of informing development of a performance assessment methodology using selected indicators identified during the literature review. The performance assessment methodology aimed for should be replicable, allowing for regular use by RBOs to assess progress in water governance decentralization. The focus of this chapter is therefore on reviewing existing methodologies and performance indicators and development of a framework and indicators for assessing performance of decentralising water governance on key IWRM functions to be applied to the three countries of the chosen Inkomati basin case study.

Section 2 of the chapter provides the overall background and contextualises WRM as a shifting concept. Section 3 illustrates using the SA context case while Section 4 gives a brief review of the literature on performance approaches and indicators. Section 5 selects preferred indicators for piloting and further development of the assessment framework and Section 6 concludes.

4.2 WATER RESOURCE MANAGEMENT AS A SHIFTING CONCEPT

Water resources are managed with a specific intention or objective and these objectives clearly differ from country to country, and of course within country from location to location. These intentions are broadly provided in existing and developing policy and legislation, and this clearly is a construct of political intent (Swatuk, 2005) as well as the key socio-economic drivers. The shifting needs of society have changed over recent decades, and increasing demands for water resources have resulted in shifts in WRM objectives, and hence our managerial approach has required appropriate paradigm shifts. As observed by numerous authors, most African countries have reviewed and put in place progressive water laws in the past decade, in line with the principles of IWRM. Decentralization of water management is one of the key elements of the concept of IWRM, and according to Sokile et al. (2005) most countries in SSA have adopted decentralisation.

Furthermore, regime shifts were underpinned by political and economic dimensions that played out within the water arena, and which reacted to support the current development needs.

Internationally, four key periods can be identified and these are no different within the Southern African context (Pegram, 2009).

a. Infrastructure and resource development

b. Improved WRM

c. Integrated WRM

d. Water for growth and development

4.2.1 INFRASTRUCTURE AND RESOURCE DEVELOPMENT

Up until the 1980's policy was dominated by the need to provide the necessary infrastructure towards ensuring food security, and therefore, water was controlled, managed and used to support the development of irrigation schemes. In countries where agriculture formed the larger part of the social and economic fabric of a country, it had a key role in cementing the water policy framework. This was clearly the case in Southern Africa.

The focus for supporting this was through the development of projects that were often strongly engineering-oriented. As the drivers were largely supply focused the scientific and social studies to consider impacts of large infrastructure were minimal, as were public participation processes. Similarly, WRM policies were largely focused on ensuring supply and were strongly focused on the irrigation sector.

In the last part of this period, there was significant growth in the industrial and mining sectors of economies and as a result shifts in understanding of consequent impacts upon water resources started to become increasingly important.

4.2.2 IMPROVED WATER RESOURCE MANAGEMENT

From the mid-1980s through the mid-1990s perspectives on WRM started to take significant shifts. This was a period of improved scientific understanding of the increasing water quality challenges that countries were facing, due to discharges from large agricultural, industrial and mining developments. Countries were starting to understand the environmental results of almost unchecked agricultural and industrial development and, in response, started to develop the management regimes to address these impacts. In the South African context, major changes in legislation were not affected, but incremental steps were taken to change approach to address growing environmental concern. Therefore, where previously there was little control on water quality problems, end of pipe standards were introduced as were Receiving Water Quality Objectives and the concepts of assimilative capacity.

Similarly, considerable progress was made in terms of understanding aquatic ecosystems and what was required to ensure aquatic ecosystem health. Linkages were made between habitat, both in-stream and riparian, as well as water quality and flow requirements to provide a more holistic understanding system health. However, with developing and diversifying economies the evolving water resources problems were of a more complex nature and required a more integrated approach and this required new policy approaches.

4.2.3 INTEGRATED WATER RESOURCE MANAGEMENT

As a result, of the previous period of increasing water quality problems from unchecked development (agriculture, industry and mining), the 1990s heralded new policy approaches based on the IWRM philosophy. This was supported by the significant political changes during this period and within the Southern African sub-region really provided the space for this, where other countries around the world have not had this opportunity.

IWRM encapsulates each of the four Dublin Principles:

- Principle No. 1 – Fresh water is a finite and vulnerable resource, essential to sustain life, development and the environment
- Principle No. 2 – Water development and management should be based on participatory approach, involving users, planners, policy-makers at all levels
- Principle No. 3 – Women play a central part in the provision, management and safeguarding of water.
- Principle No. 4 – Water has an economic value in all its competing uses and should be recognised as an economic good.

These four principles have been embraced by Southern African planners and inform and underpin the character and content of current water reforms in the region (Swatuk, 2005; van der Zaag, 2005).

It is clear that SA was in a fortunate position, in this regard, as it was able to formulate policy and legislation based upon the experiences of others and to encapsulate the principles of IRWM. It must also be noted that various related reforms have galvanised the need for better localised governance through more integrated planning. Fundamentally, seeing water resources as a national good, with the government as custodian or trustee, and also recognising the inter-connected nature of basins and resources, has been critical especially where water resources are stretched.

Certainly, across the region the premise appeared to have been that if we can get the institutions (laws, regulations, organisations) right, water will easily flow to where it is needed, and we could, in a joined-up manner, manage scarcity. However, as Blomquist et al. (2005) note these processes are complex and indeed require a series of iterations, often which involve getting things wrong, before we indeed get things right.

However, the shifts and concepts described above did not emerge from a vacuum, and can only be understood as social and political constructs shaped by the interplay of institutions, networks, interests and visions of the future (Mosse, 2004; Swatuk, 2005). Van der Zaag (2005), observed that the momentum for IWRM in Southern Africa switched pace after 1997 when water ministers from the SADC and the European Union met and frankly discussed the challenges of sharing international rivers, where *"…consensus was reached over the need for integrated water resources management"*.

A key aspect of the IWRM philosophy was to recognise the importance of more localised institutions and a stronger participatory approach. Hence, countries have initiated the establishment of CMAs and WUAs. A key functional element of these structures would be more localised and integrated planning towards improved IWRM. These strategies have both technical water resources aspects (such as resource protection, resource development, allocation and/or water quality, plans) and institutional enabling aspects (institutional, financial, stakeholder and information plans). The challenge has proved to be the much needed alignment between the various strategies at national, provincial and local government level. Implementing such a complex planning framework has stretched capacities and has been a major factor that has seriously impacted upon ability to deliver.

4.2.4 WATER FOR GROWTH AND DEVELOPMENT

In the last few years, IWRM as the catch-phrase of the last decade has started to appear somewhat idealistic, and countries began recognising that they need to appropriately adapt the philosophy to their needs and capacities. Although there are clearly key common elements to IWRM, the approach needs to be tailored appropriately. In a developmental state like the case of SA, the need to undergo reforms across the water sector as well as to support a country's continued growth and development is extremely challenging and often the planning and implementation has not been sufficient. The vast majority of development planning takes place outside of the water arena, and water managers and planners are caught trying to provide and support this development in a meaningful and sustainable way. Countries are starting to realise that unless this issue is taken on, water could indeed constrain or catalyse growth. This need is underlined by concerns around ensuring continued water security, energy security and food security so as to effectively support continued growth and development.

Planning frameworks most often exist at national, provincial and local levels, however, effective planning at these various levels is imperative and represents a significant challenge. It is essential that these various planning tools support national development objectives and reflect the broader political-economy of both country and region. At the same time, there is an emerging recognition that national development strategies need to ensure that they are framed within a water resource reality, considering current and future requirements.

Despite these countries adopting the decentralisation approach Swatuk (2005) has identified some challenges experienced by these countries relating to the management of river basins. The challenges include inequality in access to water, poor river basin infrastructure and service delivery, declining quality and quantity of the river basin natural resources. Clearly most of the challenges are a symptom of either lack of enabling framework to facilitate decentralization or failure on the part of management authorities to implement the existing framework. This has lead to African river basins experiencing limited positive impact despite water governance decentralization being implemented. A preliminary review of WMIs in the SADC reveals the following salient challenges to effective implementation of the water governance decentralization process (see Chapter 3 for more details on this):

Weak political support: Lack of political appetite to decentralize as one major challenge facing the water sector in the region. Financial constraints: Most decentralization processes are characterized by lack of appropriate financial support. Institutional arrangements: Managing water according to catchments or river basins implies cutting across existing administrative and political boundaries, creating overlapping jurisdictions and mandates, which presents difficulties with respect to coordination across administrative boundaries. Integrated planning and coordination: The lack of a structured co-ordination mechanism, supported by an effective communication plan is a major shortcoming toward successful implementation of IWRM, in particular the roll-out of decentralized WMIs.

Although the concept of IWRM has gained favourable internationally and in SA, there has been lack of systematic tools, methods and indicators for assessing the performance of IWRM and the decentralisation process. In what might be nuanced manoeuvres, there is an increasing shift and momentum within IWRM and the water discourse towards more objective approaches where it is imperative to have a system to monitor performance (World Bank; 2010). Within this momentous shift, it also becomes important to not only have systems in place but also to develop a set of indicators which can be used to measure the decentralisation process and the performance of the new institutions.

4.3 SOUTH AFRICA AS THE CASE FOR CURRENT CONTEXT

Over a decade ago DWA (and other stakeholders) in SA embarked upon a process to reform the sector, to revise not only the rules of the game, but quite critically to restructure the institutions that were involved in the game. Primarily, these institutional shifts involved the department's focus to move to policy and regulation, the establishment of CMAs to guide WRM in designated WMAs, and the establishment of WUAs to perform operational functions in support of localised management. Fundamentally, this was a shift to catchment based WRM. This was aligned to international trends and a number of drivers can be identified in support of this (Government of South Africa, 1997):

1) Achieving integrated management of the catchment so that the impact of actions in one part of the catchment on another part of the catchment can be mitigated or managed and the river system, associated wetlands and aquifers, can be managed as part of a whole. This approach also allows the integration of land use and other sectoral development plans with the management of the entire river system.
2) Facilitating the participation of stakeholders in decision making and management of water resources. The complexity of water resources management under stressed water conditions means that government alone is no longer sufficient to manage the resource. The participation of stakeholders not only gives a sense of ownership to decision making but also brings to bear the extensive local knowledge of a wide range of people. The participation of stakeholders is, however, not without its challenges.

3) The establishment of CMAs allows for a separation between the policy and national strategy functions of DWA and the operational functions of the CMA.
4) It reduces the span of control of the organisation (i.e. the national department) and allows the CMA to focus on specific functions related to the character and priority problems of the water resources within a clearly demarcated area, thus allowing the delivery of a more focused and effective service.
5) CMAs are often in a position to be more innovative in remuneration packages, recruitment and retention than government departments are, which is particularly important when dealing with fields such as WRM where there are shortages of technically competent and experienced staff.
6) Where there is an intention to recover costs of water resources management from water users, the establishment of CMAs increases the likely levels of payment, particularly where improved service delivery and local accountability is realised.

To date, nine CMAs have been legally established of which two (the Inkomati and the Breede Overberg CMAs) have been operationalised. This statistic burdened the efforts of departmental staff and stakeholders in terms of the preparatory work that had been completed in the other WMAs.

Advisory Committee processes had been completed in the Crocodile West Marico and in the Mvoti to UMzimkhulu WMAs. Governing Board nominations were also being sought in these two areas. The Gouritz, Olifants-Doorn, Thukela and Mhlatuze WMAs, having had their CMAs gazetted as established were about to embark on their Advisory Committee processes. The Berg WMA had gazetted its CMA establishment proposal for public comment, and the stakeholders and DWA staff in Limpopo and Levuvhu-Letaba WMAs have made significant progress towards their CMA establishment proposals. The Olifants WMA had developed its CMA establishment proposal with its stakeholders historically and need to revisit this with its stakeholders. Whilst this appears almost 'historic' in nature, what it reflects is a considerable amount of effort by DWA staff and by stakeholders to shift institutional processes along the policy trajectory.

From a WUA establishment perspective, processes have been slow and shifts in the requirements for transformation and establishment proposals and constitutions have caused these processes to further slowdown. Complex administrative systems for approvals further exacerbated this, until the delegation of certain WUA establishments to the Chief Director: Institutional Oversight, although challenges still exist. However, disagreement over the billing agent and implementation agent agreements has also caused deterioration in the relationship between these institutions and DWA. In June 2010, of 270 Irrigation Boards, only 83 have been transformed into 52 WUAs. Some 23 new WUAs had been established. Since then, progress has been minimal due to the institutional realignment process (DWA, 2010).

These processes were then halted due to the institutional realignment process, which was initiated in 2007. Whilst this process did clear damage in terms of the amount of stakeholder

buy-in into CMA and WUA establishment, it did provide the department with an opportunity to rethink the overall governance arrangements. This was also supported by the release of a revised governance framework for public entities by National Treasury (NT) and the Department of Public Service Administration (DPSA).

The drive to finalise the revised National Water Resource Strategy (NWRS) and the growing pressures upon water resources and the water sector, have contributed to the need to revitalise and finalise the institutional realignment process. This has also been supported by the establishment of a number of working groups that include departmental staff and external experts. In March 2012, the Minister confirmed that CMAs need to be established and there is considerable agreement within DWA that WUA processes need to be fast-tracked, whilst understanding that there are still areas of concern that require redress (DWA, 2011). The DWA Regional Offices are in support of this and noting that these processes have a direct impact upon their roles and responsibilities, this is a major step forward. Clearly, the maintenance of a sound and constructive relationship between the CMA establishment process and Regional Offices is vital.

The current model for CMAs defines nine CMAs with jurisdiction in revised WMAs that closely approximate and cover the primary drainage regions of SA, so that there is a more appropriate hydrological coverage. These changes in WMA do partner areas of limited capacity with those of greater capacity, and from a governance perspective there are also clear advantages in terms of securing sound governing boards. In addition, these larger WMAs enable more financially viable CMAs to be established.

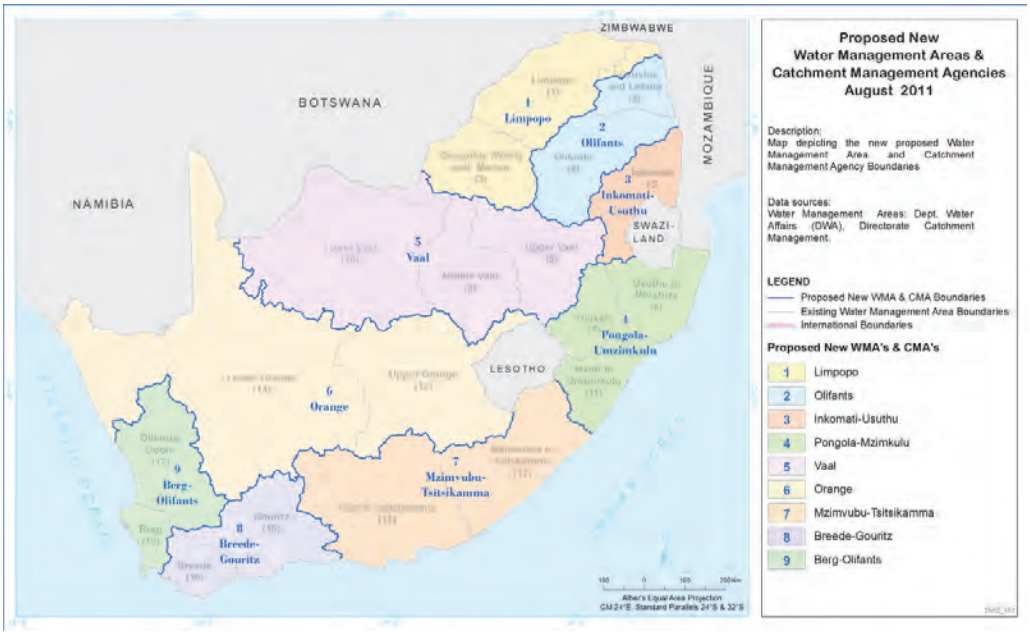

Figure 4.1: The revised Water Management Areas in South Africa (DWA 2011)

From a WUA perspective, the DWA is recognising the important role that these institutions play, and that the slow progress needs to be redressed. There is also increasing recognition that CMAs should play a far stronger role in establishing and overseeing these institutions.

A number of key considerations for CMAs are clear from a synthesis of policy and legislation (Government of South Africa, 1997; DWAF, 1998; Pegasys, 2005):

- *Institutional Governance*: Significant questions arise when one considers how we ensure effective and efficient governance regimes within institutions. This is clearly a key performance area. To date challenges have arisen from the outset and Advisory Committees should be managed to adhere to government policy regarding governance structures. In addition, there has been much reconsideration of the need for these committees and this has yet to be adjusted in the legislation. As it stands the current thinking on this matter reflects the establishment of one national Advisory Committee that advises on the structures and representation on all nine CMA Governing Boards and assists in providing guidance in working towards the governance framework established by NT and DPSA, which needs to be carefully considered. A policy position towards CMA Governing Board structure needs to be finalised, and then carried through into the NWA. Furthermore, in establishing new CMAs there is a real threat that Governing Boards stray into operational issues. Support to Governing Boards should reinforce the governance framework, and importantly, should ensure that the Board does not make this mistake. These issues have implications on how we reflect upon Governance performance.
- *Functional performance*: The role of the CMAs and the targets that they aim to achieve needs to be clarified. This has a clear impact upon how we monitor performance and the success achieved through institutional reform processes. The transition from DWA to CMA in terms of how powers and duties are delegated is not just a question of some administrative process, but rather a complex institutional-political process that influences how we proceed with developing the operational capabilities of both CMA and WUA.
- *Organisational development:* During the initial years this needs to be fast-tracked to develop core capacity, which includes stabilising financial controls, key systems as well as initial staff appointments. The role of departmental line functions in this regard must not be underestimated and can have positive and negative influences on progress.
- *Staffing*: The various Human Resource and transformational aspects need to be initiated early in the process to prevent any later delays. This includes matters such as engaging the Unions and the Bargaining Chamber regarding staff transfers, as well as developing Memoranda of Understanding between the CMAs and DWA. Regional Office and Head Office line function support for this is critical. Again, this is a key performance area that is essential in order to reach further functional development.

- *Supporting tools*: Based upon the experiences from the Inkomati and Breede Overberg CMAs a CMA "starter pack" of policies, protocols and systems can be developed and provided to support new CMAs. In effect this should smooth operational and functional development.
- *Financial sustainability:* The process to ensure that these institutions obtain the financial security they need to support their development has often been far too drawn out. In the SA context the two already operational CMAs are still dependent upon funds provided through DWA, albeit revenue collected within their WMAs. It is a fundamental financial principle that these institutions should as quickly as possible be delegated the billing and collection function as they are the closest to the customer and are directly dependent on this funding stream.
- *Stakeholder engagement*: Stakeholder support should not be underestimated and needs to be carefully considered before engaging in any institutional process going forward.
- *Project management*: Previous establishment processes tended to be systematic and often procedural. There are ways to streamline and better coordinate tasks to ensure that these institutions are established in a more effective and efficient manner.

From the various experiences related to WUA transformation and establishment processes a number of key considerations are clear (DWA, 2013):

- Administration: Processes to transform WUAs has taken in some cases years with approval processes being log-jammed. Internal administrative processes can hold institutional progress hostage and can cause serious institutional stress.
- Roles and responsibilities: These may vary from institution to institution, as well as from context to context. There is in fact a lack of agreement as to the roles and responsibilities of these more localised institutions such that their existence is often questioned. In effect, this challenge can be placed at the door of there being no overarching policy framework that sets out there institutional roles and responsibilities as well as the oversight and regulatory framework that is required.
- Transformation: There is still no common understanding of transformation objectives and how these are to be achieved. This not only relates to the nature of the institution and how we change the racial and gender disparities, but also how we transfer ownership of key infrastructure that not only empowers emerging sectors, but provides a financial basis.
- Financial support: Many of these localised institutions require financial support in order to establish and initially operate the institution. In this region where water is scarce, infrastructure is not always in place or in a good state of repair, and many communities are facing extreme financial stress, the concept of subsidies and financial support is absolutely imperative. These do need to be considered in cooperative ways with various government departments.

- Planning and reporting: The business planning and reporting frameworks need to be reinforced so that WUAs submit their business plans and annual reports as required by the NWA.

There have been, therefore, a range of institutional dilemmas faced within SA. The current WRM context has been further dogged by challenges in a range of flagship projects that, together with the institutional arrangements, were intended to fundamentally change the WRM context (DWA, 2013). These include:

- Legislative review: The NWA does require amendment to address a suite of issues that hamper implementation.
- National Water Resource Strategy: The much overdue revision of the NWRS has been completed and is now out for public comment.
- Water allocation reform: Whilst, the progress has been extremely slow, some progress has been made towards putting in place a suite of tools that can be used to undertake the process of compulsory licensing. These are complex processes and a number of them are now being undertaken.
- Licensing backlogs: Project Letsema has been undertaken to address the mounting backlogs of licence approvals.
- Waste Discharge Charge System: After a lengthy delay the DWA is now moving towards implementation of this system which supports the polluter pays principal.
- Infrastructure management: There are growing concerns regarding the operation and maintenance of infrastructure and that insufficient funds are being allocated to address the refurbishment backlogs.
- Revenue management: Improvement in the systems and the coordination with Regional Offices is seeing some progress in revenue collection, however, there are still considerable challenges ahead which will influence institutional sustainability.
- Compliance Monitoring and Enforcement: Recognised as a key element of the regulatory environment, this function was under-resourced for many years. More recently, staff have been appointed and a stringer resourcing has seen some improvement in approach.

With the above in mind one starts to distil a number of key themes that require focus when looking at WRM performance, which include: policy and legislation, institutional aspects, water use allocations, infrastructure management, finances and revenue, and regulations. These issues, amongst others, need to be considered in framing the indicators of performance.

4.4 REVIEW OF METHODS AND INDICATORS

Decentralisation is an approach aimed at facilitating IWRM, and this means that any approach to assess progress so far must align to the principles of IWRM. Several studies have been done and papers written to assess and develop a performance framework to facilitate effective river basin planning and management. Some key approaches to developing and implementing performance

indicators are reviewed briefly in this section of the report. Also it must be noted that the list of approaches reviewed in this document are by no means exhaustive and that the idea is to develop a general understanding of what has been done so far to assess performance of river basin organisations.

Lorenz et al. (2001) differentiates between performance indicators and models. Indicators are defined as variables or sets of aggregated variables that give information on the process, system or state, while models are defined as a means for predicting the future of a river basin that is subject to and impacted by variability, socio-economic development and implementation of various policies. According to these authors, the indicators and the models are concepts and tools that could potentially help summarise and communicate a large amount of information on a river basin scale. Indicators describe complex interactions and processes in river basins, while models predict the economic, environmental and ecological effects of management measures (Lorenz et al., 2001). Other authors discuss a number of characteristics that are key to effective performance assessment (Arriens et al., 2005). These characteristics and related indicators are discussed as part of a paper presented at the 2nd Regional Meeting of National Water Sector Apex Bodies held in Bangkok in April 2005 by Asia-Pacific nations. The focus of the paper was on presenting a set of performance indicators for consideration and to gain consensus on testing the proposed indicators (Arriens et al, 2005). A number of characteristics and types of indicators are discussed in the paper; however for the purpose of this review a summary of the salient features is provided below.

The authors differentiate between types of performance indicators, such as measures of effectiveness and efficiency. Effectiveness indicators measure the degree to which services provided are responsive to the needs of stakeholders, while efficiency indicators measure the ratio of the service to the cost associated with the service provided (Arriens et al, 2005). Further, the authors identify and discuss characteristics inherent in indicators such as qualitative and quantitative nature of the measured output. Qualitative indicators assess the perceptions and subjective judgements of participants with regard to the issues under investigation. For this reason qualitative indicators are seen as unreliable and difficult to verify since they represent subjective views of respondents. Quantitative indicators on the other hand are concerned with verifiable numbers. For example an assessment that seeks to determine the number of water users that pay for water used in a river basin or the number of water licenses issued are quantitative measures. Therefore Arriens et al. (2005) argued that quantitative measures stick to cold and hard facts and that for this reason there is no question as to their validity.

In line with the above characteristics, Arriens et al. (2005) also list seven WRM themes each with a number of possible outputs and indicators. Some indicators are aimed at measuring effectiveness, while others measure efficiency. To provide a picture of the proposed indicators, a list of selected indicators are briefly summarised in the Table 4.1 below.

Table 4.1: Selected indicators (Arriens et al., 2005)

WRM Theme	*Output*	*Indicator*
Water sector coordination	An independent water sector body with clear mandate, powers and functions is in place	Title of law or regulation creating the body
IWRM	National water policies specifying institutional responsibilities and levels of governance	Policies and laws implemented
Water service delivery	Responsibilities for service delivery delegated to autonomous and accountable service provider	Number of service providers
Organisational systems and processes	Skills and training of staff appropriate for their functions	Number of technical staff trained
Financial aspects	Cost recovery policies formulated and implemented	Irrigation services – yes or no
Advocacy	Public awareness	Public awareness programmes exist
Stakeholder participation	Stakeholder are involved in the development of water policies, laws, etc.	Number of stakeholders in RBO

Other authors (Hooper and Ward, 2006) describe basin management performance indicators that are selected based on their relevance to IWRM aspects such as water allocation, water use efficiency, mission accomplishment, conflict resolution and social welfare in the river basin. The indicators are categorised into six benchmarks that include:

- adaptive decision making,
- reduced water allocation conflicts,
- functioning information management system,
- stakeholder welfare,
- mission accomplishment (meeting of set RBO objectives), and
- water use efficiency.

The said authors also identify four performance indicators that fall under the decision making benchmark. These include consensual and coordinated decision making, clear roles and responsibilities of stakeholders in decision making, optimum water use among stakeholders as a result of effective decision making in the basin, and an effective decision review system (Hooper and Ward, 2006). According to the authors, water allocation, water use efficiency, and conflict resolution indicators are critical for the assessment of the effectiveness of the basin' social decision system, in particular achieving effective coordination between various sectors to achieve societal goals. The information management system represents a benchmark that supplies knowledge to the decision system and improves its ability to be a learning, adaptive organization. The key implementation indicator of the information management system is the

report on the state of the river basin. The fifth benchmark is the water use efficiency that provides evidence that the social decision system referred to above has generated land and water use practices that produce higher economic returns per volume of water used (Hooper and Ward, 2006). The social welfare of the basin community represents the sixth benchmark and focuses on the improvements in the water allocation decision system and the role played by basin stakeholders in the decision review process. However, the authors also recognise that the water allocation decisions can produce both negative and positive welfare outcomes, i.e. the decision system often produces winners and losers. For this reason it is suggested that care is needed to develop an indicator which can capture the types and the degree of impacts on the well-being/ welfare of the basin community (Hooper and Ward, 2006).

According to Hooper and Ward (2006) the information required to measure performance against the indicators can be collected from secondary sources, including published reports of RBOs and performance reviews of water resources systems. However, the authors also acknowledge the fact that often these data are not accessible, especially where there is no formal RBO. This may impact on the reliability and validity of information collected against indicators. Arriens et al. (2005) suggests that reliability is critical since it reflects the accuracy and consistency of indicators used, while validity means that information generated is close to the reality being measured on the ground.

Some authors have proposed a methodology for river basin management in small watersheds that takes two processes into consideration: consultation to support planning activities in which stakeholders and the public participate, and the engineering level process that scopes technical implementation and analysis of planning specifications (Sieker et al, 2006). The indicators should be able to pass information in both directions, thereby providing concise descriptions of the effects of various basin scenarios to decision makers. According to Sieker et al. (2006) while any indicator may be chosen, the intention of developing a catalogue of indicators should not be to compile a database containing hundreds of possible indicators, but rather to carefully select the number of indicators in accordance with set objectives.

Other authors approach the issue of river basin organisation performance from an econometric/ statistical perspective. The Dinar et al. (2005) study on institutional and policy analysis of river basin management decentralisation uses a questionnaire that has 47 questions. The questions yield 226 variables that are divided into four groups as follows: **a.** general data variables, **b.** institutional set-up variables, **c.** finance variables, and finally **d.** performance indicator variables to assess performance of the RBO. Under the performance indicator element, the questionnaire uses 14 questions to solicit information on performance of river basin organisations. The responses to the questions (performance indicators) however, do not yield answers that produce direct responses on actual performance. The final output with regard to the performance of RBOs is based on a statistical analysis that links the four groups of variables indicated above. The results of the statistical framework explain two types of relationships that are discussed in Dinar et al. (2005). The first is a relationship that explains the characterisation of the decentralisation

process such as for example, the period it took to decentralise and the extent of participation during the process. The second is a relationship that explains the level of progress and success of the decentralisation process resulting from variables that measure incremental improvement resulting from a comparison between before and after decentralisation. The authors indicate that although the two relationships are estimated separately using statistical procedures, the linkage between the two is achieved when characteristics of the river basin organisation are used to explain both the nature and performance of the decentralisation process. The results of testing the Dinar et al. (2005) approach at the southern Africa regional scale are presented and discussed in Chapter 2 whereas the continental study at SSA river basins has been undertaken by the WSPC of UC as mentioned earlier.

On the same topic of assessing IWRM performance in river basins, two comprehensive but clearly defined methodologies are provided by Cap-Net and International Network of Basin Organizations (INBO). The methodology developed by Cap-Net includes a set of indicators that are grouped according to water management functions setting clear parameters to enable *measurement of progress on the implementation of integrated water resources management, and reporting on an annual basis to management and to stakeholders* (Cap-Net, 2008). The indicators are tabulated stating each integrated WRM function, the primary water management objective, expected progress indicator and finally the unit defining the expected outcome in each area of performance. Functions included in the table are *stakeholder participation and decision making (water governance), basin planning, water allocation, water pollution control, financial and economic performance, floods and drought management.*

The INBO indicators on the other hand, are grouped into two areas: governance and technical performance indicators. The governance indicators include various themes from political and legal aspects, institutional and organisational framework, finance mechanisms, participation, programming, to information and communication system aspects (INBO and ANBO; 2010). The technical indicators assess programme outputs and quality of progress made in river basin organisations.

A GWP Southern Africa Regional IWRM Assessment Report (GWP, 2009) assessed progress on implementation of the integrated WRM approach in the SADC region. The approach to the study was developed based on the thirteen GWP toolkit[4] elements and nine SADC Regional Water Policy themes (SADC, 2006). The two are consolidated into eight focus areas in order to provide an assessment of progress with the implementation of IWRM. The indicators in the approach used are categorised into two main areas, namely: Enabling framework and management instruments. The enabling framework has four main sub-categories of indicators, while the instruments are divided into five sub-categories. Without going into detail, the sub-categories include *policy and legislation, water resource planning, institutional and monitoring &*

[4] http://www.gwptoolbox.org

information for the enabling framework, and *environmental sustainability, allocation and efficiency, infrastructure, stakeholder engagement, and finance* as instruments (GWP, 2009). It must be noted however, that the objective of the study was to assess progress of IWRM implementation at a regional level. The assessment therefore focused on the SADC as a region, with twelve countries taking part in the process.

Additional work on performance indicators has been done by the GWP and INBO (2009) where indicators were subdivided into three different but interrelated sub-sets:

- *Process indicators,* which monitor the basic progress of implementing the actions outlined in the strategy. This includes monitoring implementation processes and also the tracking of inputs, e.g. the people, money, and equipment needed to achieve actions.
- *Outcome indicators,* which monitor the direct results of actions.
- *Impact indicators,* which monitor progress towards achieving goals and objectives.

The advantage with the subdivision above is that a clear understanding of the linkage between goals, objectives, actions and targets help management make decisions on the type of indicators to be used to monitor performance. Also this is in line with the suggestion by Booth et al. (2002) that preliminary approaches to choose indicators must take into consideration the *purpose* of each of the proposed indicators, since the aim is to track progress towards specific objectives and outcomes. Indicators should be clear and relate to the targets and actions defined in the strategic objectives. For this reason, the quality of the indicators can only be assessed in terms of the role they are expected to play (Booth et al., 2002).

In addition, these indicators provide a sense of progress by understanding the key aspects that are required towards effective and efficient WRM. These indicators are then not data based as are many indicator systems, but aim to provide a pragmatic snapshot that can then indicate not just what has been achieved, but also what still needs to be achieved. The suggested system should then provide a progressive sense of achievement. This is particularly relevant in the Southern African context, for a number of reasons:

- Policy and legislative reforms take time, but implementation takes even longer,
- Institutional processes are largely in a state of flux,
- Complexity of issues and difficulty in reaching clear decisions about how to proceed hamper progress, and
- Capacity is often stretched so that the data required for more data intensive systems is extremely difficult to obtain.

Within this context we have tried to work towards something that is pragmatic, easily completed, and provides direction as to things that need to be achieved.

4.5 PROPOSED PERFORMANCE INDICATORS

The objective of this phase of the project is to assess performance of the decentralisation process and the implementation of IWRM principles by in-country river basin management institutions in the three selected countries. Achieving this objective requires that a methodology with a set of indicators is developed and tested for implementation by the targeted RBOs in the three states (Mozambique, South Africa and Swaziland). The methodology discussed below is framed in line with indicators developed by GWP. Additional aspects of the methodology such as progress indicators and units defining actual performance on implementation of specific IWRM functions are taken from the Cap-Net approach.

In addition to the inherent characteristics discussed below, there are two reasons for choosing the approach and indicators proposed above. The first is that the GWP and Cap-Net indicators are based on aspects of water governance and IWRM. The second and perhaps the most important reason is that, these indicators have been tested in a number of RBOs and in the case of the GWP indicators at regional scale in the SADC. Since the countries targeted for the performance review are part of the SADC region, it makes sense to explore further the extent to which progress has been made at in-country level toward implementing the decentralisation process by applying an approach similar to the regional one. Such a process is likely to be successful if the existing methodologies and indicators are used with minor adaptations to suit existing in-country river basin organisations.

In line with the reasons discussed above, the proposed indicators are selected for their simplicity, practicality, relevance and reproducibility. Indicators must be simple, focusing on two aspects essential for effective river basin management and therefore support the achievement of the main IWRM objectives. The INBO and Cap-net indicators are categorised according to these two aspects:

1. E*nabling framework that define rules created by legislation and policy*
2. *Management instruments that define practises necessary for successful implementation of decentralisation process in river basin* (GWP Toolbox: Knowledge Sharing Tool).

It is our view team that the selected indicators are easy to interpret[5] and pragmatic enough to allow for easy measurement within specific time intervals. The indicators are also pragmatic enough and show elements of concreteness to facilitate basin planning and enable managers develop objectives and measures that are easy to report on. Lastly the selected indicators render themselves relevant and applicable to all RBOs, since they are based on the IWRM approach. For this reason they are likely to be reproducible as a tool to allow for continuous assessment, monitoring and reporting by the relevant RBO. Since both INBO and Cap-Net performance indicators have a focus on trans-boundary RBOs, not all indicators proposed below will be applicable in the context of in-country river basin organisations. Therefore, a selection of

[5] Interpretation also refers simplicity and immediateness of the indicators, and hence the instant availability of information.

specific indicators is necessary to ensure that RBOs are assessed based on what is relevant to their specific situation.

4.5.1 ELEMENTS OF THE PROPOSED APPROACH

The selected indicators are divided into 4 main themes each with one or more indicators capturing elements that describe the enabling framework, the management instruments, and the operational instruments. These can be seen at different scales with the enabling framework being more national in nature, the management instruments touching national and regional scales, whilst the operational instruments encompassing both regional and local levels.

The four main themes and their sub-indicators are described briefly below. The list is by no means exhaustive, and the focus of the assessment is on elements that are critical for the success of the decentralisation process and effective WRM. The performance survey should also generate information based on actual planning and implementation with managers of RBOs providing a critique of the framework and suggesting ways to improve it.

Table 4.2 presents assessment indicators associated with the enabling framework, and a brief description of each element is provided below. The indicators that have been chosen are generic in nature and do not attempt to answer questions regarding specific WRM issues. For this reason, detailed information on for example, the performance of RBOs on water quality monitoring and the related technical measures to address any challenges in this regard will not be reported on at this stage.

The enabling framework constitutes the first category of indicators that aim at assessing the environment within which RBOs operate to determine the extent to which it is conducive to achieving IWRM objectives. The first column on the left of Table 4.2 captures the country and RBO under review, and the rest of the table illustrates both the primary categories and selected indicators per category.

Table 4.2: Enabling framework indicators

Enabling Framework								
	Policy & legislation	**Institutional Framework**		**IWR Planning**		**Monitoring and information**		
	Mechanisms for participation, clear mandate	Arrangements	Capacity	Infrastructure/ supply; catchment development plans	Disaster/ climate change	WR Monitoring and information	Strategy implementation	IWRM Impact
Mozambique (DNA/Ara-Sul)								
Swaziland (MNRE/ RBAs)								
South Africa (DWA/ ICMA)								

- ***Policy and legislation*** (including in-country cooperation and mechanisms to achieve stakeholder participation and enable decision making). It is important to note that RBOs vary with regard to the type of functions they perform. For this reason, the area of policy and legislation will also look at existing mandates given to the various RBOs targeted for the assessment. The primary aim is to assess the extent to which policy and legislation in the countries enables effective and efficient functioning of the RBOs. Also critical is the understanding of the extent to which the various RBOs have the necessary authority or are delegated responsibility to effectively implement their mandates.
- ***Institutional framework***. This covers issues of institutional arrangements, roles and responsibilities and the capacity of these institutions to strategise in a coordinated manner, implement integrated WRM plans is critical to achieve integrated river basin management. Institutional capacity also relates to the organizational framework and the implementation capacity within that framework, as well as mechanisms for dispute resolution in the context of IWRM. The performance of the targeted RBOs will be assessed with regard to the role they play in facilitating the establishment of new institutions and its role in ensuring that the roles and responsibilities of the various institutions are coordinated to meet basin-wide objectives.
- ***IWR Planning***. Assesses whether RBOs in the case study basin have put in place strategies and plans that set out infrastructure requirements, IWRM plans (catchment strategies and development plans), including the assessing the extent to which

management support instruments have been put in place to ensure effective implementation. This element of the assessment also explores availability and extent of implementation of disaster management and progressive approaches to address challenges resulting from climate change.

- ***Monitoring and information management***. This element is about having good data collection and analysis systems as a foundation for IWRM. As indicated in Table 4.3 below, this theme includes water resources and information management around strategy implementation and monitoring of impact of the IWRM process. Efficiency and effectiveness in managing water resources requires that information management systems and tools are put in place and implemented.

Table 4.3: Management instruments required to ensure successful implementation of the decentralisation process

	Allocation and efficiency		**Infrastructure**		**Stakeholder engagement**	**Finance**	
	Water allocation/ authorisation	Water use efficiency	Development	Operations	Engagement of sectors, etc.	Pricing (users)	Sustainable/ adequate finance
Mozambique							
Swaziland							
South Africa							

Following the understanding of the enabling environment above, the focus of this element (management instruments) of the approach is on assessing progress with regard to the implementation and management of the various elements of the IWRM. Performance assessment elements under the management instruments include the following:

- ***Water allocation and efficiency***. This component assesses the demand side management, water allocation plans and the extent to which these have been implemented in the basin, including water quality, water use/ efficiency and availability issues, legal water use and authorisations.
- ***Infrastructure management***. This covers development and operation of water resource infrastructure in the basin.
- ***Stakeholder engagement***. Since decentralisation is about ensuring river basin stakeholders are directly involved in the process to develop basin plans and decision making, this element assesses structures and processes designed to facilitate stakeholder awareness and engagement to effect social change in the river basin.
- ***Finance***. Water allocation may not succeed if it is not accompanied by relevant components that support sustainability such as water pricing and collection of user

charges. Effective implementation of the decentralisation process means that adequate funding is generated through collection of necessary user charges.

Table 4.4 describes the operational instruments that support effective WRM at the more localised level and relate to functional, planning and reporting, institutional coordination and regulatory aspects.

Table 4.4: Operational instruments

	Functional		**Planning and Reporting**		**Institutional Coordination**	**Regulation and Oversight**	
	Delegated powers and duties	Implementing agent	Coordinated planning	Annual reporting	Inter-governmental and sector engagement	Compliance Monitoring	Enforcement
Mozambique (Ara-Sul/ RGBs)							
Swazila/ WUAs)							
SICMA/ WUAs)							

Performance assessment elements under the management instruments include the following:

- ***Functional.*** This element assesses whether roles and responsibilities have been clarified and formalised through delegated powers and duties, as well as the possibility of implementing agent agreements or contracts being in place to perform a variety of WRM functions.
- ***Planning and reporting***. It is key to have coordinated and connected planning regimes and this becomes easier as one gets closer to more localised levels. This supports collective action and more integrated solutions. Regular and structured reporting is a key part of taking up responsibility and being accountable for delivery and includes not just vertical reporting, but also reporting horizontally.
- ***Institutional Coordination***. The use of intergovernmental platforms is important to support coordinated activities and joint ownership. This underpins the integrated planning, which provides the basis for coordinated activities.
- ***Regulation and Oversight***. The development of a regulatory framework and its subsequent implementation are key to providing the stability required to develop resources and support socio-economic growth. Compliance monitoring is essential and provides the basis to enable enforcement when needed. Clear actions are required with no ambiguity. Stakeholders do need to understand this framework and the various consequences

Our approach to gathering information on the decentralisation process will employ interviews, desktop research and review of documentation made available by the relevant RBOs. The tables described will act as dashboards to paint a picture of progress or none so far. This will be accompanied by a narrative description of the progresses per RBO. The narrative will capture results to determine the extent to which the RBOs decentralisation processes have facilitated the meeting of *process, outcome and impact* indicators.

4.5.2 HOW TO SCORE THE PROPOSED APPROACH

These above 12 areas cover the key aspects necessary to drive the decentralisation process as highlighted in the GWP toolbox and the SADC Regional Water Policy. We propose a scoring scheme that will involve colouring of areas that are being assessed. The colour red indicates that little has been achieved, orange signifies limited achievements, and green signifies substantial achievements. The arrows reveal trends, with ↑ indicating a positive trend towards improvement, ↔ indicating little movement (either improvement or degeneration) from the current status, and ↓ indicating a downward trend from the current status. Each RBO surveyed will have results represented in tables indicated above. In addition, a narrative will also be written to capture and explain the outcome as depicted in the tables.

4.5.3 POSSIBLE QUESTIONS TO CONSIDER UNDER EACH ELEMENT OF ASSESSMENT

In order to complete the tables and to compile a short narrative a number of questions are required and we give some guiding examples below for the following aspects considered under the various headings in Tables 4.2-4.4.

1. Enabling framework (Table 4.2)

Policy and legislation: Is the policy and legislation in place and does it reflect the principles of IWRM? Is the mandate and functions of the RBO clearly defined in the policy and legislation?

IWR Planning (e.g. infrastructure/supply; catchment development): Does the planning reflect traditional supply side/infrastructure based approaches, or does it reflect catchment based processes and the integration of water and economic planning?

WR Planning (e.g. disaster/climate change): Does the water resources planning deal with disaster management planning and planning for climate change?

Institutional Arrangements: Are effective institutional arrangements in place to support IWRM?

Institutional Capacity: Does adequate institutional capacity (finance, human resources, etc.) exist to implement IWRM?

Monitoring and Information (e.g. WR monitoring and information): Is there adequate monitoring of water resources (quality and quantity)?

Monitoring and Information (e.g. strategy implementation): Is there effective monitoring and information on the implementation of the IWRM strategy?

Monitoring and Information (e.g. impact): Is there effective monitoring of the impact of IWRM implementation?

2. Management Instruments (Table 4.3)

Environmental sustainability: Are environmental impact assessments conducted on water resources infrastructure development projects, are environmental water requirements met, and is water quality managed effectively?

Allocation and Efficiency (e.g. water allocation/authorization): Are effective allocation and authorization mechanisms that support the principles of IWRM in place?

Allocation and Efficiency (e.g. water use efficiency): Are water use efficiency (water conservation and demand management) initiatives being implemented?

Infrastructure (e.g. development): Is there sufficient infrastructure to meet needs and to ensure availability of supply during droughts?

Infrastructure (e.g. operations): Is water infrastructure being effectively operated and maintained?

Stakeholder Engagement: Is there effective stakeholder engagement in place?

Finance (e.g. pricing for users): Are there clear tariff policies for raw and treated water, and is there effective billing and revenue collection?

Finance (e.g. sustainable/adequate finance): Is there adequate, sustainable finance available to support the implementation of IWRM?

3. Operational Instruments (Table 4.4)

Delegated powers and duties: Have any powers and duties been delegated by the Minister? Are institutional roles and responsibilities clear?

Implementing agent: Have any implementing agent agreements or contractual arrangements been put in place?

Coordinated planning: Is there interaction over the various planning tools? Do we see your institutional concerns reflected in the various plans?

Annual reporting: Are annual reports being produced and circulated?

Intergovernmental and sector engagements: Are intergovernmental relations formalised? Are there 'working groups' that meet? Are there broader engagement processes that involve the key sectors?

Compliance monitoring: Is there is regular and on-going compliance monitoring? Who undertakes this monitoring and how is it reported?

Enforcement: Are enforcement actions taken? Are administrative enforcements actions taken? Are their civil or criminal cases?

4.6 SUMMARY AND CONCLUSIONS

The short review of approaches and indicators, above, shows that a lot of work has been done to determine progress and answer important performance questions at river basin level. Most of the studies and papers briefly referred to above capture relevant IWRM aspects that serve as requirements for basin management, and therefore critical for assessing progress and the impact of river basin organisations. Booth et al. (2002) suggests a process to choose indicators and argues that understanding the purpose of the chosen indicator is critical and should inform tracking of performance associated with the indicator. Sieker et al. (2006) suggest that any indicator may be chosen that enables passing of information to enable decision making in line with set objectives in the basin. Clearly, indicators must be defined as part of a coherent strategic process that takes into consideration the monitoring and evaluation requirements necessary for tracking progress. In this instance indicators must be viewed as building blocks that provide the baseline needed to inform planning for IWRM.

Indicators identified by Hooper and Ward (2006) are elements of IWRM and are relevant for assessing RBO performance. These indicators are divided into seven benchmarks: a societal decision system indicating the level of coordination between sectors to achieve societal goals through consensus. Four indicators fall within this societal benchmark. An information management system is a second indicator that supplies knowledge to enable an effective decision system. The third indicator is a water use efficiency indicator represents the sixth benchmark that provides evidence relating to the effectiveness of the social decision system. Finally, the social welfare benchmark captures the well-being of basin communities following implementation of the indicators above. Dinar et al. (2005) uses a statistical approach to assess performance of decentralised river basin organisations. Variables that depict the characteristics of the decentralisation process and those that capture incremental progress are used to estimate and compare the before and after status of decentralisation. Indicators described by INBO/ANBO (GWP and INBO, 2009) and Cap-Net (2008) are aimed at assessing the performance of river basin organisations that have a trans-boundary rather than in-country focus. This is an important point to note since this review and development of indicators assignment focuses on assessing performance of in-country river basin organisations. For this reason, less time and space is dedicated to providing a summary of these indicators.

The GWP Southern Africa Report on the progress of the IWRM implementation processes uses a set of indicators developed based on the GWP Toolkit. The indicators have been used in several countries in the SADC and are designed to provide insights on the enabling framework and management instruments applicable at river basin level. Although the indicators were used to assess IWRM at a regional scale, similar indicators are likely to be effective when applied to assess performance of river basin organisations that operate at a country level.

A methodology framed in line with indicators developed by GWP has been developed for testing and use for this study with some elements adapted from the Cap-Net approach, such as progress indicators and units defining actual performance on implementation of specific IWRM functions. Two reasons for choosing the approach and indicators proposed above are: (1) GWP and Cap-Net indicators are based on aspects of water governance and IWRM, and (2) perhaps the most important reason is that, these indicators have already been tested in a number of RBOs and in the case of the GWP indicators at regional scale in the SADC. Since the countries targeted for conducting the performance assessment intended here form part of the SADC, it makes sense to explore further the extent to which progress has been made in these countries toward implementing the decentralisation process applying an approach similar to the regional one with minor adaptations to suit existing case study RBOs.

The adapted INBO and Cap-net indicators are categorised according to two aspects: (1) enabling framework that define rules created by legislation and policy, and (2) management instruments that define practises necessary for successful river basin governance decentralisation. The selected indicators are considered easy to interpret, pragmatic enough, with elements of concreteness to facilitate river basin planning and enable managers develop measures that are easy to report on, and are likely to be reproducible as a tool to allow for continuous assessment, monitoring and reporting by the relevant RBO. Since both INBO and Cap-Net performance indicators have a focus on trans-boundary RBOs, not all indicators proposed will be applicable in the context of our case study in-country RBOs. Therefore, a selection of specific indicators is necessary to ensure that RBOs are assessed based on what is relevant to their specific situation.

The selected indicators are divided into 4 main themes each with one or more indicators capturing elements that describe the enabling framework, the management instruments, and the operational instruments. These can be seen at different scales with the enabling framework being more national in nature, the management instruments touching national and regional scales, whilst the operational instruments encompassing both regional and local levels. The four main themes and their sub-indicators proposed are not exhaustive, and the focus of the assessment is on elements that are critical for the success of the decentralisation process and effective WRM.

The enabling framework constitutes the first category of indicators that aim at assessing the policy, legal and institutional environment within which RBOs operate to determine the extent to which it is conducive to achieving IWRM objectives. The second category of indicators captures performance assessment elements under management instruments, which include water use

efficiency, infrastructure management, stakeholders' engagement and financing. The third category covers operational instruments with performance elements ranging from planning and monitoring, functional and institutional coordination, and legislation to enforcement and compliance. To collect information needed for construction of the proposed indicators guiding examples of types of questions to be included under each were provided.

CHAPTER 5: IMPLEMENTATION EXPERIENCES AND PERFORMANCE OF WATER GOVERNANCE DECENTRALIZATION IN THE THREE COUNTRIES OF THE INKOMATI RIVER BASIN

5.1 INTRODUCTION

The purpose of this study is to assess the experiences with and performance of water governance decentralisation and implementation of IWRM principles by in-country river basin management institutions in the three southern African countries sharing the Inkomati river basin (IRB), namely: SA, Mozambique and Swaziland. To achieve this, an assessment framework methodology and indicators have been developed and presented in Chapter 4. This chapter reports results of the pilot testing of the developed methodology and the changes that need to be made before application to the three case study countries. The adapted assessment framework and indicators' set were then employed to carry the assessment survey in the IRB countries and results of the survey data analysis are presented and discussed in the following sections.

This chapter thus is organized in five sections. The next section provides the context and background to the case study. Section three discusses changes made to adapt the developed methodology to the case study situation and presents the adapted approach and methods. Results of the empirical analyses of the collected data are presented and discussed in section 4 and section 5 concludes with implications of the study.

5.2 BACKGROUND TO THE CASE STUDY BASIN

The IRB[6] has been chosen to conduct the study where three states are involved in management of the basin common resources. It is one of 15 international river basins covering approximately 47,000 km^2. The Inkomati River flows in the eastern part of SA, through the north of Swaziland, into the southern part of Mozambique where it discharges into the Indian Ocean. The IRB comprises 28,700 km^2 (61%) in SA; 15, 500 km^2 (31%) in Mozambique and 2,600 km^2 (6%) in Swaziland (Carmo Vaz and Pereira, 2000).

The river basin is made up of 7 catchments (Figure 5.1), namely: Komati (11,200 km^2), Crocodile (10,470 km^2), Sabie (7,050 km^2), Massintonto (3,430 km^2), Uanetze (3,930 km^2), Mazimechopes (3,970 km^2), and Incomati (6,690 km^2) (JIBS, 2001; van der Zaag and Carmo Vaz, 2003).

[6] Note: since the WRC and research team are based in South Africa, the South African name for the basin is used in this study

Figure 5.1: The IRB and its catchment areas (taken from Consultec and BKS Acres 2001)

5.2.1 WATER RESOURCE AND ITS USES IN THE IRB

There are an estimated two million people living in the river basin; however domestic use accounts for only a small proportion of water use in the basin. The economic activities in the IRB include irrigated agriculture, afforestation, mining, and tourism. Table 5.1 below shows the estimated water resource uses in the IRB in 2002, of which irrigation agriculture (868 Mm^3/year) and forest plantation (521 Mm^3/year) sectors are the main water consumers, followed by inter-basin water transfers. SA and Swaziland have extensive areas of irrigated agriculture (including sugar cane in Swaziland) and exotic tree plantations, both of which are consumers of large quantities of water. There are two bulk water transfers in the IRB including; the transfer from the basin by SA of roughly 132 Mm^3 per annum as cooling water for thermal power generation and the transfer by Swaziland of 136 Mm^3 per annum from the Komati, mainly for irrigating sugar cane.

Table 5.1: Estimated consumptive water use (Mm^3/year) in the IRB in 2002 (Source: JIBS)

	Country			Total (Mm^3)
	Mozambique	South Africa	Swaziland	
Water Generated	***171***	***2937***	***479***	**3587**
Domestic and Municipal	4	98	8	**110**
Industry	11	35	1	**47**
Forest Plantations	2	473	46	**521**
Irrigation	150	670	48	**868**
Inter-basin Transfer	0	132	135	**267**
Total (Mm^3)	**167**	**1408**	**238**	**1813**
% of water use	9	78	13	**100**
% of water generated	97	48	50	**51**

The IRB comprises of 22 large dams, mostly located in SA. Secondary data collected for this study indicates that in 2014:

Mozambique's side of the basin has no urban centres and thus supports a rural population, from groundwater (10%) and the remainder directly from surface water. The water infrastructure in the basin includes: 3 reservoirs, 1 dam and a number of pump stations. About 80% of the water is used for irrigation of 25 000 hectares of land, 3% for industry use, some hydropower use, 2 % for domestic use, and 10% provision for the environment.

On the South African side of the basin 1600 million m^3 is utilised for irrigation agriculture. The majority (92%) of water in the basin is surface water, providing 3207 million m^3 of water per annum. Infrastructure on this side of the basin includes 1182 million m^3 stored in dams. Infrastructure on the Swaziland's side of the basin includes 1 canal, 12 reservoirs (23.41 million l), 1 dam, 4 water treatment plants (15 million l) and 1 pump station.

5.2.2 TRANSBOUNDARY AGREEMENTS IN THE IRB

The uses of water in the IRB have been negotiated since 1964 when the governments of SA and Mozambique signed an agreement in Lisbon on waters of common interest. However, 1982 became the ground-breaking year when a drought struck southern African countries. As a result, major efforts were taken towards the management of the shared water course and a number of bilateral and trilateral agreements on the sharing of the waters of common interest were signed (Ramoeli, 2002). The most important of these agreements signed since 1983 are:

- **In 1983:** Agreement on the establishment of the Tripartite Permanent Technical Committee to discuss matters pertaining the water resources of common interest;
- **In 1992:** Treaty on the Development and Utilization of the Water Resources of the Komati River Basin, 13 March 1992;

- **In 1992:** Treaty on the Establishment and Functioning of the Joint Water Commission, 13 March 1992;
- **In 1996:** the establishment of a Joint Water Commission to provide a forum through which the management of shared water course issues are discussed and advice given to the respective governments;
- **In 1998:** Southern Africa Development Community (SADC) signed the SADC Protocol on shared watercourses, calling for cooperation between riparian countries on shared watercourses;
- **In 2002:** The Tripartite Interim Agreement on Water Sharing of the Maputo and Incomati Rivers (the IncoMaputo agreement) was signed. This is the first elaborate water-sharing agreement based on the principles of IWRM; and
- **In 2003:** a protocol on Shared Watercourse Systems to foster closer cooperation for judicial, sustainable and coordinated management, protection and utilization of shared watercourses and to advance regional integration and poverty alleviation.

The utilisation of the Inkomati River water course is based on a principle of equitable use as explained in the Interim IncoMaputo agreement (IIMA), Article 7(1), "*the three countries (parties) shall be entitled, in their respective territories, to optimal and sustainable utilisation of and benefits from the water resources of the Incomati and Maputo, taking into account the interest of the other parties concerned, consistent with the adequate protection of the water courses for the benefit of the present and future generations.*"

The IIMA also outlines the agreed flow regimes and maximum utilisation of the water in the Inkomati, in Article 4 of Annex 1 (see Table 5.2).

Table 5.2: Utilisation of the Inkomati water course (August 2002) (taken from Aurecon and DHI, 2010)

	Mozambique	South Africa	Swaziland
First Priority Supplies*	19 million m3/a (up to 87.6 million m3/a reserved)	336.6 million m3/a	22 million m3/a
Irrigation Supplies	280 million m3/a	786 million m3/a	261 million m3/a
Afforestation Area	25 000 ha	364 975 ha	32 442 ha
Afforestation Runoff Reduction	25 million m3/a	475 million m3/a	46 million m3/a

*The first priority Supplies include water required for domestic, livestock and industrial use.

5.3 APPROACH AND METHODS OF THE STUDY

A performance assessment methodology has been developed in Chapter 4 proposing a set of indicators to be validated and employed in this study to evaluate water governance decentralization experiences in the IRB. The developed methodology adapted the GWP framework for analysis of IWRM implementation including elements from the Cap-Net

approach, such as progress indicators and units defining actual performance of specific IWRM functions. The GWP outlines the following three *overriding principles* of IWRM:

- *Economic efficiency in use:* water must be managed for maximum possible efficiency;
- *Equity in water:* water must be managed to recognise the basic right of all people to have access to water of adequate quantity and quality for the sustenance of human well-being;
- *Environmental and ecological sustainability:* water must be managed in a manner that the present use of the resource does undermine or compromise the use by future generations.

The framework and approach to IWRM recommended by GWP also includes the following three complementary elements (criteria) within the above principles (GWP, 2000):

- *the enabling environment* – where IWRM being the foundation of national policies, legislation and regulations;
- *the institutional roles and functions* – where the roles and functions of the various administrative levels and stakeholders are designed and outlined to address IWRM principles; and
- *the management instruments* – where IWRM underpins operational instruments for effective regulation, monitoring and enforcement and thus allowing decision-makers to make informed choices.

The three *criteria* further provide details and information on *change areas* related to the IWRM principles. The recommended approach was based on the thirteen GWP toolkit[7] elements and nine SADC Regional Water Policy themes (SADC, 2006). This recommendation was adapted for implementing the study with additional change areas from the literature, resulting in following 13 change areas utilised to assess the performance in the IRB:

Under the enabling environment criterion

1. Policies – setting goals for water use, protection and conservation.
2. Legislative framework – the rules to follow to achieve policies and goals.
3. Financing and incentive structures – allocating financial resources to meet water needs.

Under the institutional roles criterion

1. Creating an organizational framework – forms and functions.
2. Stakeholder participation
3. Institutional capacity building – developing human resources.

Under the management instruments criterion

1. Water resources assessment – understanding resources and needs.
2. Plans for IWRM – combining development options, resource use and human interaction.

[7] http://www.gwptoolbox.org

3. Demand management – using water more efficiently.
4. Conflict resolution – managing disputes, ensuring sharing of water.
5. Regulatory instruments – allocation and water use limits.
6. Economic instruments – using value and prices for efficiency and equity.
7. Information management and exchange – improving knowledge for better WRM

A hierarchical approach was utilised to apply the above performance assessment framework. This hierarch, shown in Figure 5.1, comprises of principles, criteria, change areas/measures.

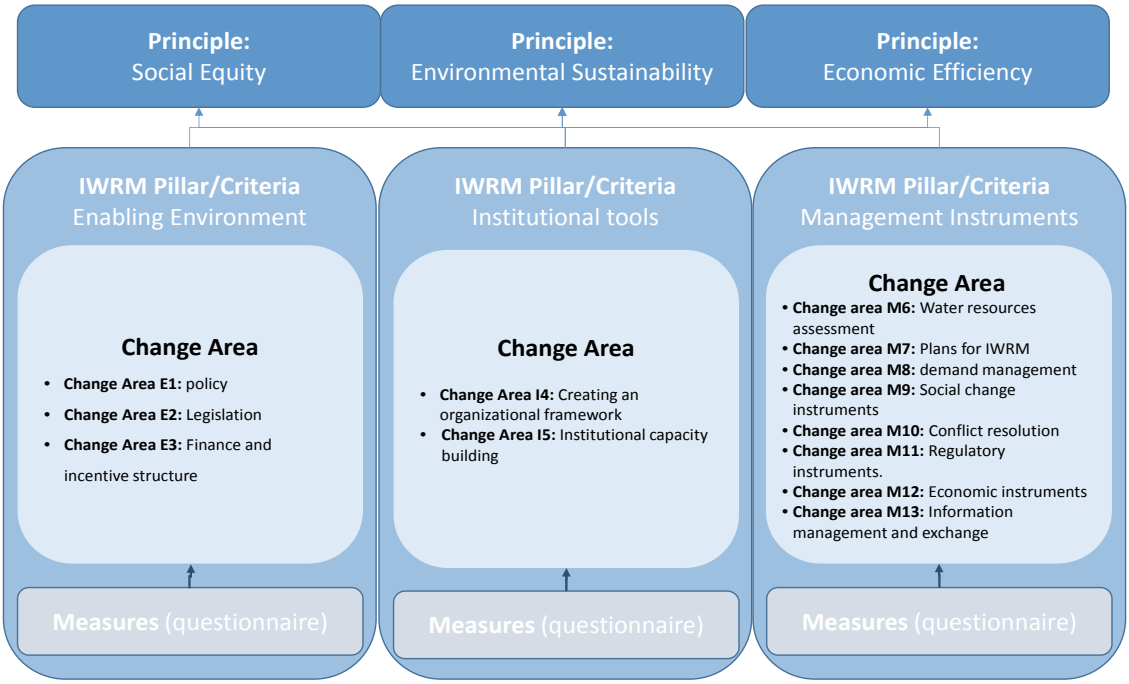

Figure 5.2: Hierarchy approach utilised in the performance assessment of IWRM in the IRB

The approach used in this study serves to test the questionnaire (Annexes A and B), facilitate further refinement of the preferred approach and method (see Annex F for discussion of lessons learned from the pilot testing), and clarify the variables that are most relevant to the basin.

5.3.1 THE DATA, SURVEY DESIG AND SAMPLING PROCESS

Data was collected from both primary and secondary sources. Secondary data was collected from reports and published literature on the IRB and primary data was collect through a survey utilising a structured questionnaire. Respondents were purposefully selected representing key informants to address the objective of the research, which aim to assess effectiveness of decentralisation and progress in implementing the IWRM change areas in the study countries. Two groups of respondents were targeted, firstly those who are directly involved in the water governance decentralisation process as part of state and local government institutions (hereafter

referred to as Level 1 or L1 respondents). The second group of target respondents were stakeholders who are impacted by or impact on decentralised decision making in the basin, including water users and interest groups residing in the area of operation (hereafter referred to as Level 2 or L2 respondents).

5.3.2 STAKEHOLDER ENGAGEMENT PROCESS

Given that basin stakeholders are a critical part of the study, a stakeholder engagement protocol was developed and implemented (see Annex D). An initial stakeholder list was compiled for the three countries, but the list continued to grow as stakeholders provided recommendations of other individuals/organisations that may have insight relevant to this study.

Respondents who participated in the study were categorised into those shown in Table 5.3. It is clear that the majority of respondents were from public organisations, water management institutions (WMIs) and commercial users. A total of 26 respondents, 7 L1 respondents and 19 L2 respondents, participated in the study. Table 5.3 also shows that a much higher number of respondents were from SA, followed by Swaziland and a small sample from Mozambique. During the fieldwork assessment in Swaziland, the 7 respondents which were included in the study were shown to be the most important stakeholders who should be included in the study. The respondents indicated that interviewing additional respondents, other than these 7, would not provide any additional useful information. The number of Mozambique respondents was limited by the time constraint of this study, as gaining agreement to participation took significant time. The full list and other details of individuals included in the sample is shown in Annex E.

Table 5.3: Organisation categories of respondents which were included in the IWRM performance assessment

Organisation Category	Mozambique	South Africa	Swaziland	TOTAL
1. Departments and Spheres of Government (Lever 1)	2	4	1	**7**
2. Water Resource Management Institutions (CMA,WUA, WB) (Level 2)	1	3	2	**6**
3. Conflict and Dispute Resolution Bodies (e.g. Water Tribunal) (Level 2)	0	0	0	**0**
4. Commercial Users (energy, forestry, agriculture, etc.) (Level 2)	0	4	3	**7**
5. Emerging Users(Level 2)	0	1	1	**2**
6. Environmental Interest Groups (conservation areas, consultants, activists) (Level 2)	1	3	0	**4**
7. Developmental Interest Groups (Level 2)	0	0	0	**0**
8. Other (Level 2)	0	0	0	**0**
TOTAL	**4**	**15**	**7**	**26**

Data was collected through two questionnaires, one targeted to government institutions (state, local government) (Level 1 questionnaire) and one targeted management institutions and other stakeholders in the basin (Level 2 questionnaire). The interviews were targeted at the management level, specifically staff members with background and knowledge in the process of WRM in the IRB. The questionnaires comprised a series of structured questions (measures) related to one or more IWRM change areas. Data from these questionnaires provided the information which was analysed for the IRB.

5.4 RESULTS OF THE SURVEY DATA ANALYSIS

Data was analysed using the Statistical Package for Social Sciences (SPSS). Since the L1 and L2 samples are relatively small, caution should be taken in drawing definitive conclusions for IWRM at a country scale. However, the sample from SA and Swaziland could be viewed as sufficiently representative to infer conclusions for IWRM performance in the basin itself. Where possible, the study attempted to support statistical results with evidence from secondary data sources.

Data analysis structured the responses in the questionnaire into the relevant change areas which were utilised in the performance assessment, i.e. all questions were categorised into one of the 13 change areas in the hierarchy. The study also refers to River Basin Organisation (RBO) as a collective term for the decentralised water resource management institutions (WRMIs) across the 3 countries. However, the term in Mozambique is referred to as ARA (Administração Regional de Águas in Portuguese); CMAs in SA and River Basin Authorities (RBA) in Swaziland.

5.4.1 IWRM ENABLING ENVIRONMENT

This section of the report details the extent to which the 3 countries basin institutions have been able to foster an enabling environment for decentralisation and for implementation of IWRM. The decentralisation/IWRM enabling environment is fostered through developing and implementing the policy, planning and legal framework needed to guide and coordinate WRM, development and use.

GWP (2000) indicates that a well-structured and effective IWRM enabling environment will ensure the rights and assets of all stakeholders in a water basin are protected, as well as facilitating the protection all public assets (i.e. such as intrinsic environmental values).

The IWRM enabling environment thus provides the “rules of the game’” for water resource governance in a basin (GWP, 2000). Assessment of the IWRM enabling environment in the IRB includes assessment of performance of:

A. IWRM in water policies;
B. IWRM in in water legislation;
C. IWRM financing and incentive structures.

5.4.1.1 POLICIES: SETTING GOALS FOR WATER USE, PROTECTION AND CONSERVATION.

A water policy provides the water imperatives (vision) for management of water resources and services, with formulation of a water policy providing all stakeholders in the sector with the opportunity to contribute and provide input into determining and formulating these imperatives.

Adopting an integrated approach to WRM will often require far reaching reforms to the national and local water policies of a country, followed by legislative reform (UNEP, 2012).

The assessment of the performance of decentralisation and IWRM in the water policy which governs the Inkomati River Basic organisation and stakeholders include:

- Using secondary data, to review IWRM principles in the water policy of the 3 countries in the basin;
- From primary data provided by the respondents in the survey, determining:
    - existing policies in the IRB.
    - the extent to which these water policies in the three countries contribute to the decentralisation of WRM.

The focus of the review of secondary data is on the NWP of the country. Other national water-related policies such as water allocation, flood and drought control, pollution control, etc. are not included in the review of literature. Similarly it was not possible to review the policy documents of all the River Basin Authorities, hence information on these is only provided by the respondents in the study.

WATER POLICY IN MOZAMBIQUE

After independence in 1975 the new constitution of Mozimbique was enacted, with far reaching impacts on the structure of WRM in the country (Matsinhe, 2012). The consitutional development process was followed by a review of the current new water policies and legislation. The first significant new policy which was developed and that impacted on the Mozambiquan water sector was the NWP, promulated in 1995.

The policy was developed to shift government responsibility from direct implementation to a more facilitative role (Water Aid Mozambique, 2010). According to the policy, the role of the Government was not to be involved in the delivery of services but rather to define water priorities, provide guidelines and minimum levels of services, delivery information and promote and regulate water activities in the country (Ibraimo, 1999).

The policy outlines that WRM will be decentralised to autonomous entities at the basin level and water supply and sanitation to provincial level programmes (Ibraimo, 1999). The policy views IWRM as the means to optimise the benefits of water in the community, taking into account environmental impacts and conservation of the water resources for the future.

In 2007 the Palestinian National Authority (PNA) was revised in the context of the Millennium Development Goals (MDGs) and the experiences of ten years of sector reform, and became the Water Policy (Water Aid Mozambique, 2010). Fundamental parts of the Water Policy are:

- Water is an economic good
- Promotion of participatory WRM
- Regular updating of knowledge on water resources and water uses
- Preparation and regular updating of river basin plans.

WATER POLICY IN SOUTH AFRICA

Similar to the policy reform of Mozambique, with the advent of a democratic government in SA in 1994 the country embarked upon a water reform process which culminated in a number of new water policies including the White Paper on Water Supply and Sanitation (1994) and the White Paper on a NWP for SA (1997). Both of these policies remain the leading policy documents in the water services and WRM sectors of the country.

As both these documents were developed and promulgated after the ICWE and UNCED, both are underpinned by the four Dublin Principles and IWRM. It is clear that SA was in a fortunate position as it was able to formulate policy and legislation based upon the experiences of others and to encapsulate the principles of IWRM. SA has adopted the principles of IWRM into their national policy framework.

The White Paper on Water Supply and Sanitation (WS&S) (DWAF, 1994) which outlines the objectives of the water services sector in the country includes the key IWRM principles of:

1. *integrated development* of water services;
2. provision of water services to reflect the *economic value of water,* without undermining long term sustainability and economic growth; and
3. provision of water services with consideration and protection of e*nvironmental integrity.*

At least three of the principles outlined in the 1994 White Paper relate to social equity in the sector, namely that *basic services are a human right;* priority in planning and allocation of public funds will prioritise those who are *presently inadequately served* and national funding for provision of basic services will be *equitably distributed among regions*. Finally, the White Paper on Water Supply and Sanitation WS&S also indicates that, to address Constitutional imperative, water services provision in SA should be implemented at local level wherever possible (DWAF, 1994).

Water policy was strengthened by the development and gazetting of the White Paper on NWP (DWA, 2013), which set out new integrated policy positions for protection, use, development, conservation, management and control of SA's water resources (Karodia and Weston, 2005). The White Paper clearly indicates that, in its formulation, it has taken cognisance of international

water policy development and trends and that it has taken note of a number of landmark international events which have influenced the direction of WRM including the World Conference on Water and the Environment (Dublin, 1992); the UNCED Earth Summit – Agenda 21 (Rio de Janeiro, 1992); the Drinking Water and Environmental Sanitation Conference on the Implementation of Agenda 21 (Noordwijk, Meeting of Ministers, 1994) and the Global Water Partnership meeting in Stockholm, 1996).

The White Paper on NWP (DWAF, 1997) introduces the concept of integrated approaches to WRM, including decentralised management of water resources in the country. The policy mandates that *WRM functions which should be approached in an integrated manner include resource allocation and protection, use and conservation, monitoring, planning, development and operation. The complexity of an integrated approach to WRM reinforces the need to assess competing water-uses on the basis of optimum rather than simply beneficial use. It has been concluded that the most appropriate unit in which this can be done is either the catchment, part of a major catchment or a water system in which a number of catchments are linked. Whatever arrangement is introduced, it must be clear that it will remain subject to national authority* (DWAF, 1997). The 1997 White Paper is also clear that the 3 IWRM principles underpin water policy in the country, mandating that:

- Social equity: in line with Constitutional requirements, the objectives of the 1997 White Paper is to promote equity in access to, and the benefits from, the nation's water resources. Water equity can be found throughout the 28 Water Principles which underpin the water policy of the country, with the principle of equity also being central to the water law reform process.
- Environmental sustainability: in line with Section 24 of the Constitution which states that any development and use of natural resources (including water resources) must be environmentally sustainable, the 1997 White Paper includes a number of resource controls and protection measures to ensure this constitutional impetrative, including the setting aside of water for the Ecological Reserve, resource protection, source directed controls and their enforcement and water conservation.
- Economic efficiency: Principles 7 of the 1997 White Paper mandates that the objective of managing the quantity, quality and reliability of the Nation's water resources is to achieve optimum, long term, environmentally sustainable social and economic benefits to society from their use.

Secondary data thus indicates that the two chief water policies of the country have a strong and explicit foundation on the IWRM principals. The question that remains is to what extent these principals have been applied in practice in the country over the past 20 years.

WATER POLICY IN SWAZILAND

The reform of the Swaziland water policy began with the development of the NWP in 2000. Financial assistance for this process was provided by the United Nation Development

Programme (UNDP). In 2006, the Regional Water Policy and Strategy document was approved and the National Water Authority (NWA) held back the process to finalise the document. In 2007, NWA created a multi-stakeholder Working Group to assist with the finalisation process of water policy.

The final draft of the NWP document was approved in the year 2009, with an aim to provide a clear demarcation of responsibilities of various stakeholders and institutions involved in the integrated development and management of water resources in Swaziland (Ministry of MNR&E 2009). The overall objectives of NWP are to (MNR&E, 2009):

- Promote integrated planning, development and management of water resources with particular emphasis on roles and responsibilities of stakeholders;
- Increase access to water for previously deprived sectors of the society without prejudicing existing water users;
- Ensure provision of adequate and good water quality for all and accessible to all citizens;
- Ensure that trans-boundary obligations are met at all times.

WATER POLICY IN THE IRB CASE STUDY

All three countries in the case study have seen changes to water policy in the last 20 years, with the inclusion of IWRM principles into these primary national water policies and a process of decentralisation initiated.

POLICIES IN THE BASIN

Six out of the seven of L1 respondents in the survey indicated that policies were in place for; (1) water allocation) (2) pollution control and (3) water monitoring. A smaller group (4) of the L1 respondents indicated awareness of water policies for flood and drought control. A particularly high percentage of L2 stakeholders indicated they were also aware of a number of policies which are in place for water allocation (74% of respondents). Analysis of country details for policies is shown in Table 5.4 below:

Table 5.4: Number of L2 Stakeholders Responses on Awareness of Water Policies within Mozambique, South Africa, Swaziland

Policies	Country (N=19)			Total (%)
	Mozambique n=2 (%)	South Africa n=11 (%)	Swaziland n=6 (%)	
Water allocation	1 (50)	8 (73)	5 (83)	**14 (74)**
Water monitoring	1 (50)	10 (91)	2 (33)	**13 (68)**
Water Pollution	1 (50)	7 (64)	3 (50)	**11 (58)**
Flood & drought control	1 (50)	5 (45)	4 (67)	**10 (53)**

Water allocation policy: About 50% of Mozambique, 73% of SA and 83% of Swaziland L2 respondents were aware of a water allocation policy in the basin. When respondents were asked

to further explain of their answers, the South African respondents *indicated that the allocation policy is defined by (1) the verification and validation (V&V) process; (2) the licensing process; (3) the process of Reserve determination and (4) implementation of the Water Resources Classification. The water allocation policy for the basin is then outlined in the water allocation plan for the ICMA.* The Swaziland respondents *indicated that the decentralisation process is still in its infancy; however they indicated that the policy for water allocation is part of the national policy, legislation and process and is part of the KOBWA Development strategy*.

Water monitoring policy: 68% of L2 respondents were aware of this policy in the basin. Off the three countries, SA had a higher percentage (91%) of L2 respondents who were aware of water monitoring policy, followed by Mozambique (50%). A much lower percentage of L2 respondents (33%) on the issue was observed in Swaziland. When respondents were further asked to explain, respondents from SA indicated that that ICMA is *currently actively participating in water monitoring programmes for the catchment. Water monitoring will also form part of the Reserve Implementation. Necessary monitoring requirements must be implemented by ICMA to achieve compliance and enforcement* (ibid. ICMA) and that there is a *long record of this especially for reserve implementation and international treaties*. The Swaziland respondents indicated that the water monitoring policy is currently being implemented and is included in the Water Act (WA) of 2003.

Water pollution policy: 58% of L2 respondents indicated the presence of a pollution control policy in the basin. A higher percentage was from the South African respondents (64%), followed by both Mozambique and Swaziland with 50%.

Flood and drought control policy: approximately only half (53%) of the L2 respondents were aware of such a policy in the basin. Country level analysis showed that 50% of the Mozambique respondents were aware of such a policy, while 45% of the South African and 67 % of Swaziland respondents were aware of such a policy. The South African respondents explained that the flood and drought policy is linked, to some extent, to dam operations, while the ICMA outlined that *flow management forms part of the Inkomati Catchment Management Strategy (ICMS). Flows are managed through the Crocodile River Operations Committee. This is yet to be extended to other river systems.* The Swaziland L2 respondents on the other hand, indicated that the flood and drought control policy is currently included in the WA of 2003, forms part of the draft IWRM plan being developed by the DWA and forms part of the new Water Policy of the country.

INTEGRATED WATER RESOURCES MANAGEMENT IN POLICY

When L1 respondents were asked whether these policies included IWRM principles, five of the seven L1 respondents indicated that the policies were in line with IWRM principles. The IWRM principles believed to be included in the policies. South African responses with regards to IWRM being included in the policies are as follows:

Water as an economic good: *The Principle has more emphasis in the Water Allocation Policy, where it is highlighted that water is also a right but needs to be conserved and shared in an equitable manner.*

Stakeholder participation: *This principle is catered for in all the policies, stakeholder involvement is key in IWRM as it embraces the bottom up approach in decision making or water governance.*

Role of women in water: *This principle is catered for in all the policies especially in the Water Allocation and Reform policy, gender equity is crucial in IWRM.*

Water as a finite and vulnerable resource: *The Principle is more emphasised in the Water Allocation Policy, where it is highlighted that water is also a right but needs to be conserved and shared in an equitable manner in order to provide for water security. The Principles is included in the Bulk Water Agreement signed among Mbombela Local Municipality, Semcorp Silulumanzi and Manchester Irrigation Board.*

L2 respondents were also asked whether they felt these basin policies included IWRM principles, with 79% of respondents indicating that this was the case. From a country perspective, 50% (Moz); 90% (RSA) and 100% (Swaz) of respondents indicated that they believed the basin policies are included in these principles. When those who responded positive on the above question were requested to expand on which of the IWRM principles were included in the policy, the results are those shown in Table 5.5.

Table 5.5: L2 respondents detail on inclusion of IWRM principles in policy in the IRB

Principle	Country		
	Mozambique	**South Africa**	**Swaziland**
Water as an economic good	1. Economic good principles are included in Law 016/91 Water Law of August 2001. This document regulates criteria of water uses in terms of business of water in Mozambique (Agriculture and Hydropower generation)	1. Best Beneficial Use is the key underlying principle of the Water Allocation Plan. It is recognised that access to water and current water allocations are not meeting the domestic and eco0mic needs of stakeholders (ICMA) 2. With a strong commercial agricultural sector in the basin – that sector is a key decision maker.	1. Economic good of water is included in the WA of Swaziland and Water Policy 2. Water is not sold in Swaziland, but used for economic development

Principle	Country		
	Mozambique	South Africa	Swaziland
Stakeholder participation	1. Stakeholder participation is included Law 016/91 Water Law of August 2001 & Resolution 53/2004 of Dezembro 1st. The Interim Tripartite Agreement among Mozambique, RSA and Kingdom of Swaziland for Cooperation about a Protection and Uses of Water Resource in Incomati and Maputo Rivers also addresses these principles.	1. Collaboration and identification of stakeholders is done; communication engagement is done as well. 2. A key strategic direction for the ICMA is to establish and maintain structures and process that are inclusive, transparent and consensus-based. The responsibility for facilitating the stakeholder centred design of the system lies with the ICMA. 3. Stakeholders are involved in catchment river forums and are involved in the drafting of the Catchment Management Strategy, etc. 4. Stakeholder participation is excellent as it takes place from grass roots (local catchment forums) all the way to an ExCo and Governing Board level (whether there is seamless communication across this hierarchy is another question though).	1.There are stakeholder participation forums for discussions of water 2.Stakeholder participation is outlined in the WA
Role of women in water		1. The Principle is implied through the equity-centric focus of the Inkomati Catchment Management Strategy. 2. Currently a catchment woman indaba is being organised 3. There is a strong representation of women in the decision making process and within the institutions that manage water.	1.Role of women in water is not explicit 2.Role of women decision making is a challenge
Water as a finite and vulnerable resource	1.Included in the Water Resource Management Strategy	1. Resource Protection/Resources Directed Measures and Regulating Water Use/Source Directed Controls are key strategies for the ICMA in order to achieve the interrelated objectives of sustainability and equity. 2. The Principles is included in the Catchment Management Strategy 3. The Principles is recognised amongst stakeholders, at least at the forums. There is general recognition that the Inkomati is already largely a closed system.	1.The Principles is discussed in detail at forums

It is clear from the L2 responses that stakeholder participation is viewed as a key principle in the various WRM policies in all three countries.

POLICY CONTRIBUTION TO DECENTRALISATION

Finally, respondents were asked whether they felt current policies contributed to the decentralisation of WRM in the country and basin. Five of the seven L1 governmental respondents and just under two-thirds (63%) of L2 respondents felt that policies were contributing to the decentralisation process. Country analysis showed that 50% of Mozambique, 55% of South African and 83% of Swaziland of L2 respondents specified that water policies are assisting the decentralisation process. When asked to expand on this issue, respondent's comments included that:

In SA, they mentioned that policy contributions to decentralisation are mainly through Catchment Management Strategy, long-term strategic action programmes to achieve catchment water-use that is sustainable, equitable, and efficient. Respondents further mentioned that the Local Water Board does adhere to the policies that contribute decentralisation. However, due to the limited delegation of powers to the Inkomati Catchment Management Agency (ICMA), the policies only contribute to a certain extent. In Swaziland, respondents mentioned that policy contributes to decentralisation through the establishment of the RBO. While in Mozambique, policies are contributing through improved co-operation between Partners in WRM (IRB) and through the creating of Committees such as REMCO, TPTC, and CBI.

L1 respondents showed a strong belief that national government had been instrumental in crafting these policies, while fewer respondents (4) indicated that the public and basin stakeholders were instrumental in crafting these policies. When the L1 respondents were asked of the decentralisation process period, those from SA and Mozambique indicated that the decentralisation process had been ongoing for the past 20 years. While the Swaziland L1 respondents explained that the decentralisation process was currently ongoing with very little activity yet occurring.

It seems clear from the above analyses that respondents are familiar with national and basin level policies but were not clear as to where these policies emanate from, as comments were largely related to how the policy was being implemented in the basin.

5.4.1.2 LEGISLATIVE FRAMEWORK: THE RULES TO FOLLOW TO ACHIEVE POLICIES AND GOALS

The legislative framework of a country provides the foundations for implementation of IWRM, providing the rules to follow to achieve IWRM policies imperatives and goals (GWP, 2004). Assessment of inclusion of decentralisation and IWRM in the legislations which govern the Inkomati RBO and stakeholders will include:

- Using secondary data, a review of IWRM principles in the water legislations of the 3 countries in the basin;
- From primary data provided by the respondents in the survey, determining:
    - existing legislative mandates given to various organisations/stakeholders in the IRB that are targeted for the assessment.

- the extent to which legislation in the three countries enables effective and efficient functioning of the RBOs.
- The extent to which the various authorities have the necessary authority or are delegated responsibility to effectively implement their mandates.

IWRM IN WATER LEGISLATION OF MOZAMBIQUE

The Mozibamique water policy was preceded by the promolgation of the new Water Law (DNA, 1991). The national law establishes (GWP, 2008):

- that water resources are public domain
- the competences of the Government to manage water resources that are public domain
- the principles for WRM
- the general regime for water use
- the rights and obligations of water users, with a distinction established between waters of free use and those whose use is dependent on a licence or concession

The Water Law introduces the crucial principle of water for common and private use. Common use aims at meeting the domestic, personal and family water needs, including the drinking of cattle and small scale irrigation. Water for private use needs authorization that can be given by law, licence or concession, under the following general principles and constraints (Ibraimo, 1999; GWP, 2008):

- water supply for domestic use has priority over all the other private uses;
- no private use will be allowed if they conflict with the water requirements for environmental conservation;
- conflicts resulting from water scarcity to satisfy different requirements will be solved in function of the socio-economic value of each use.

According to the new WA, the National Water Directorate within the Ministry of Public Works and Housing (MOPH) is responsible for formulation and implementation of water policy in the country, as well as the planning and management of water resources and the provision of rural water supply and sanitation and reporting (Limpopo River Awareness Kit, undated). However, activities related to irrigation and drainage is the responsibility of the National Directorate for Agricultural Hydraulics (DNHA) within the Ministry of Agriculture and Rural Development (MADER).

The MOPH has provincial directorates of Public Works and Housing (DPOPH) within each of which is a Department of Water and Sanitation (DAS). DPOPH plays a facilitative and supervisory role at Provincial level. The sector is still highly centralized, with funding proposals and new sector initiatives coming from central government.

Article 18 of the Water Law, requires the establisment of regional water authorities (*Administração Regional de Águas – ARA*) to direct regional WRM. The ARAs maintains

financial and organisational autonomy, but reports to the National Water Directorate (Limpopo River Awareness Kit, undated). There are currently five RWA envisaged in the Act, namely (Figure 5.2):

- ARA Sul, that covers the south border of the country to the basin of the Save river;
- ARA Centro, that covers the basin of the Save river to the basin of the Zambezi river;
- ARA Zambezi that covers the basin of the Zambezi river;
- ARA Centro Norte – that covers the region from the basin of the Zambeziriver to Lurio river and
- ARA Norte – that covers the basin of the Lúrio river to the northern border.

Figure 5.3: Regional Water Authorities of Mozambique (taken from Limpopo River Awareness Kit, undated)

ARA-Sul is the water agency responsible for the river basins in southern Mozambique, including the trans-boundary Inkomati River. The Water Law of 1991 provides for a limited role of stakeholders in WRM, with the chief manner for this stakeholder participation being through the Basin Committees (GWP, 2008). These Basin Committees have a consultative role only.

The decentralisation approach to WRM has been applied in Mozambique; however, according to the literature there are still challenges. The ARA-Sul (2011) indicated that the following are still required under the decentralised management of river basins: 1) improving stakeholder participation; 2) implementation of IWRM; 3) enforcement of the role of Regional Water Agencies; 4) some users still extract water without formal permission (ARA-Sul, 2011). According to the UN report on the Statue of Application of Integrated Approaches to WRM, Mozambique was one of the approximately 25% countries that reported they faced management obstacles relating to legal IWRM frameworks in the country (UNEP, 2012).

IWRM IN WATER LEGISLATION OF SOUTH AFRICA

The water legislation of SA is based on the principles of efficiency, equity and sustainability. Although, decentralisation is a prominent feature in the country's water reform process, the pace and outcome of decentralisation has not been satisfactory to stakeholders (Segal, 2009). For example, less than fifty percent of the proposed CMAs have been established, but are not fully functional (Lotz-Sisitka and Burt, 2006). Outlined in the NWA of SA are that the Minister is trustee of the water resources of the country, with water forming part of a public trust. The Act makes provision for a suite of water uses, some of which require water authorisation in the form of registration of use or licensing (See Box 1).

Box 5.1: Water allocation regulatory system as outlined in the NWA

The NWA introduces a new water allocation regulatory system for SA, with effectively 3 levels of allocation; namely water rights for the basic needs and ecological Reserve, water to meet international obligations and water use allocations. Figure 5.6 shows that the water use allocation system where all water uses must be licensed unless it is listed as a Schedule 1 water use, is an existing lawful use (ELU), is permissible under a general authorization (GA), or if a responsible authority waives the need for a license.

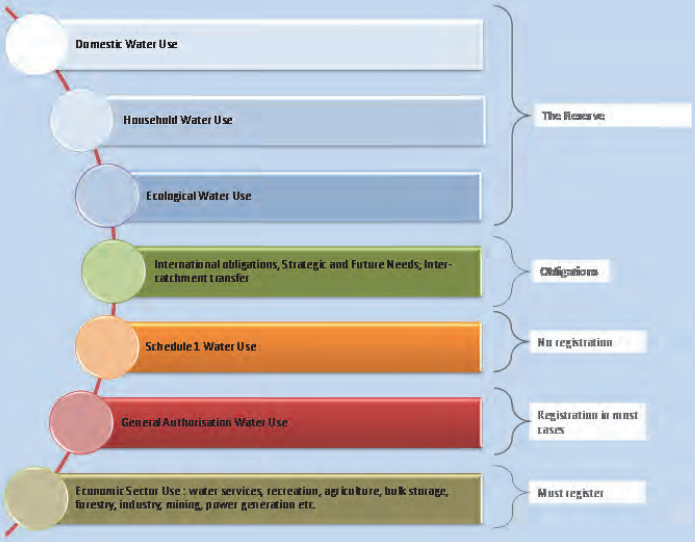

Figure 5.4: Water use categories in SA, showing water authorization requirements for each

Section 22 of the NWA defines the hierarchy of permissible water use shown in Figure 5.6, which also provides a hierarchy to prioritise access to the resource, to include (RSA, 1998):

- **The reserve:** – the only water right recognized in the NWA, consisting of the right to (1) the basic human needs reserve (BHN) and the (2) ecological reserve.
- **Schedule 1 water use –** according the NWA is the allocation of small quantities of water for use for domestic purposes; for use in emergency situations and for recreational purposes (DWAF, 2004).
- **General Authorization (GA) water use:** – according the NWA is the conditional authorized allocation of larger (than Schedule 1 use) volumes of water for a specific type of water use or category of water user (DWAF, 2004).
- **Licensed Water Use (WUL):** – all water use which is detailed as a recognized water use in Section 21 of the NWA and which exceeds the GA regulation are required to apply for a WUL. Licenses give existing and prospective water users authorization to use water, or to access water resources for beneficial purposes.

An important challenge of IWRM in SA is to balance these various water use authorizations between water users to ensure equitable access and use of the resource.

The DWA is the regulator of water in the country and has the responsibility to development and enforce IWRM policy. This includes development and enforcement of water resources and water services policies, legislation, strategies and regulations.

The NWA, based on the IWRM principle of decentralisation, calls for the establishment of RBOs to take responsibility for WRM at a regional or catchment level. The role of RBOs is to ensure

that water resources are protected, used, developed, conserved, managed and controlled in accordance with national policies, guidelines and standards, through the active participation of local communities and other stakeholders (DWA, 2013).

The National Water Resource Strategy2 of 2013 indicates that slow delegation of functions to decentralised management institutions such as RBOs, with the associated authority and responsibility, and delays in the transfer of funds have impeded the effective functioning of the RBOs. Only two RBOs are currently operational in SA: the Inkomati RBO in Mpumalanga and the Breede-Overberg RBO in the Western Cape (DWA, 2013). Due to the slow progress in gazetting, and a number of issues related to this process, the Minister announced in 2012 that the number of RBO to be establishment in SA will be reduced from the originally planned nineteen to nine RBOs (Figure 5.7) (DWA, 2013).

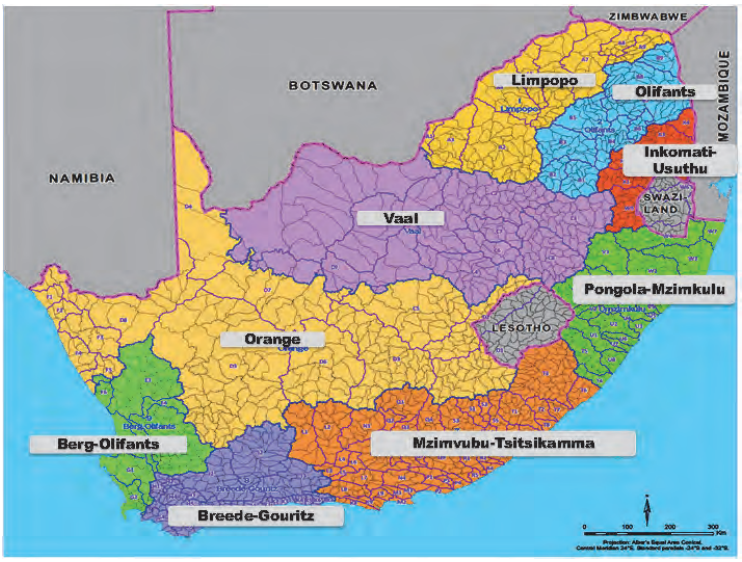

Figure 5.5: CMAs in South Africa (taken from DWA, 2013)

The NWA also introduces, as part of the IWRM decentralised WRM process, the establishment of Water User Association's to perform operational functions in support of localised WRM. From a WUA establishment perspective, processes in SA have been slow. Currently only a limited number of WUA have been formulised and transformed. This is due to a number of complex factors including reluctance on the part of some Irrigation Boards to transform and complex and laborious administrative systems for approvals of WUAs. In June 2010, of 270 Irrigation Boards, only 83 have been transformed into 52 WUAs. Some 23 new WUAs have been established. Since then, progress in decentralisation of WRM through the establishment of RBOs and WUA has been minimal due to the DWA conducting an institutional realignment process.

In addition to the mandate responsibility for localised management of water resource by RBOs and WUA in SA, the Water Service Act mandates for the decentralisation of responsibility for

management of water services to Water Service Authorities (WSAs) and Water Service Providers (WSPs) (Shreiner and Hassan, 2011). WSAs are metropolitan municipalities, an authorised district municipality or an authorised local municipality which is responsible for ensuring provision of water services within their area of jurisdiction. A WSP on the other hand, is an organisation or any person who has a contract with a Water Services Authority or another water services provider to sell water to, and/or accept wastewater for the purposes of treatment from, that authority or provider (bulk water services provider); and/or has a contract with a Water Services Authority to assume operational responsibility for providing water services to one or more consumers (end users) within a specific geographic area (retail water services provider).

The decentralisation of water services in SA have fared much better than that of decentralisation of WRM, in that many of the municipalities in the country have embraced their role as local WRMIs and have made significant progress in management of water services at this level. This decentralisation process has not been without its own difficulties.

Integration of the role of WSA/WSPs and localised WRMIs has also been slow, largely due to the slow progress in formalising of the decentralised WRMIs.

IWRM IN WATER LEGISLATION OF SWAZILAND

Swaziland has five principle river basins (the Lomati, Komati, Mbuluzi, Great Usutu and Ngwavuma) whose total annual renewable water resources amount to 4.5 billion m3, 42% (1.87 billion m3) of this water originating in SA (UNESCO, undated) (see Figure 5.8).

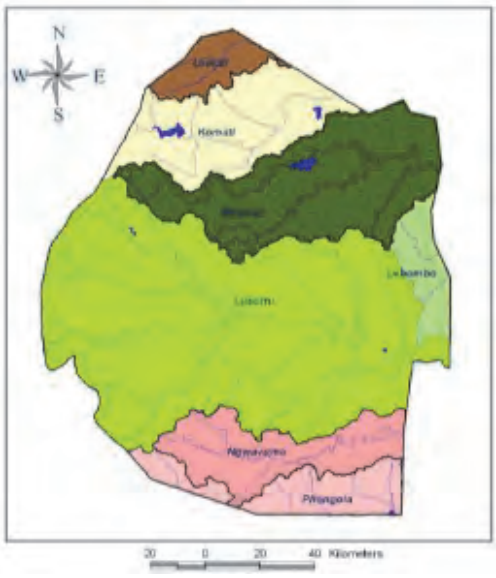

Figure 5.6: River basins in Swaziland (taken from Brown, 2011)

Until recently, management of water resources in the country was through several uncoordinated pieces of legislation, spread among a number of Ministries and other non-government

institutions. However, this changed in 2003 with the enactment of the new WA, which replaces the WA of 1967 (Zaikowski, 2007). The Act declares all water found naturally in the country as a national resource[8] and makes it a requirement for anyone utilising the water to apply for a permit, except for persons or communities who use the water for primary purposes[9] (UNEP, 2012).

The institution in Swaziland responsible for regulation of the new WA is the Department of Natural Resources. Like SA, the development of the Swaziland WA of 2003 was in a fortunate position to be formulate based upon the experiences of others and to encapsulate the principles of IWRM such as improve catchment management through enhanced stakeholder participation and decentralisation of WRM (Government of Swaziland, 2003). The new Act legislates the establishment of:

i) **A National Water Authority (NWA):** envisaged to be a highly participatory body corporate whose role is to supervise the activities of the Basin level structures and to provide policy advice to the DWA.

ii) **River Basin Organizations (RBOs):** mandated to manage dams and rivers based on resources by issuing water user permits amongst other responsibilities. There are currently five RBOs in Swaziland, including Lomati, Komati, Mbuluzi, Usuthu and Ngwavuma.

iii) **Irrigation Districts (IDs)**: are gazette body corporates of a $^{2}/_{3}$ majority of water users in a district that are mandated by the Act to control the operation and maintenance of works in the district and the distribution of permitted volumes of water in accordance with permits. The ID can also perform functions at the conveyance of the Minister. The ID is governed by a board of directors.

iv) **Water User Associations (WUAs)**. At the approval of the ID board a WUA of holders of permits in an area or watercourse/river system can be formed. The objective of the WUA is to maximise the benefits from their permitted water and promote efficient use thereof. The ID board may also delegate to a water user association certain powers.

Since the adoption of the new WA of2003, Swaziland has adopted a more decentralized designation of powers to guide the future of water development and management in the country, apart from the Act outlining the establishment of decentralised management institutions. However, the literature indicated that the overall transformation and decentralisation process in the country has been slow and not yet taken place, largely due to a lack of funding.

[8] This was further deep rooted in the 2005 Constitution that declare, in its section 210, water as a national resource and vests the ultimate responsibility for its protection in the State. The section 215 of the 2005 Constitution, rules out any private right of property in any water found in Swaziland.

[9] Defined as "the use of water for domestic requirements, sanitation, the watering of animals not exceeding 30 head of cattle or the irrigation of land not exceeding one-quarter hectare adjoining or occupied with a homestead of not more than 10 persons but does not include the use of water by a local authority for distribution to the inhabitants of the area"

WATER LEGISLATIVE INPUTS FROM STAKEHOLDERS IN THE IRB

Legislation in all three countries decentralises WRM authority to RBO in the form of Regional Water Authorities (*Administração Regional de Águas – ARA*) in Mozimbique; CMAs) in SA and Regional Basin Authorities in Swaziland.

LEGISLATIVE MANDATE FOR ESTABLISHMENT OF RBOS

Survey respondents were asked whether legislation outlined the requirements for establishment of RBOs and if so, does the legislation mandate the responsibilities of these RBOs.

Analysis of the survey results show that 6 out of 7 L1 respondents (86%) specified that legislation for the establishment of RBOs does exists in the IRB. One of the South African respondents indicated that *DWA is currently reviewing the NWP positions which are embedded in the National Water Resources Strategy. There is also a chapter on review of institutional arrangements and establishments like RBO and catchment management forums. It's through these management forums that decentralisation, successful or not, will be measured*. The Swaziland L1 respondent did not answer this question.

Legislation mandate for RBO responsibilities and the Ministers delegation powers

Respondents were also asked whether there was a legislative mandate for RBOs responsibility for flood/drought control, water resource planning, pollution control, water monitoring, stakeholder participation, water allocation, or none of these responsibilities.

Table 6 and 7 below shows the number of L1 respondents who indicated legislation mandates for RBO responsibilities and the minister power to mandate responsibilities of RBO. All the L1 respondents did largely agree that the mandated responsibility of the RBO and the minister power included water resource planning, pollution control, water monitoring, stakeholder participation and water allocation functions with numbers ranging from as high as 5 (71%) to 6 (86%). The exception was on responsibilities for RBO to perform the flood/drought function, with only a small group of respondents (43%) agreeing on the flood/drought function to be performed by RBO.

The country analysis indicated that South African L1 respondents were not in agreement on the legislation mandates for RBO to perform flood/drought and water allocation functions. However, more respondents felt there was a legislative mandate to the RBOs for the pollution control, water monitoring and stakeholder participation functions. A strong emphasis was also indicated by South African respondents on the minister power to per perform all six functions. Mozambique and Swaziland on the other side, though a small sample size, L1 respondents believed that both RBO and the minister had legislative mandate for all the responsibilities.

Table 5.6: Number of L1 respondents indicating mandated responsibilities of RBO in legislation

Responsibility	Country (N=7)			Total (%)
	Mozambique (n=2)	South Africa (n=4)	Swaziland (n=1)	
Flood/drought control	1	1	1	3 (43)
Water resource planning	2	2	1	5 (71)
Pollution control	1	3	1	5 (71)
Water monitoring	2	3	1	6 (86)
Stakeholder participation	2	3	1	6 (86)
Water allocation	2	1	1	4 (57)

Table 5.7: Number of L1 respondents indicating Ministers power to mandate responsibilities of the RBO

Responsibility	Country (N=7)			Total (%)
	Mozambique (n=2)	South Africa (n=4)	Swaziland (n=1)	
Flood/drought control	1	2	1	4 (57)
Water resource planning	2	3	1	6 (86)
Pollution control	1	3	1	5 (71)
Water monitoring	1	3	1	5 (71)
Stakeholder participation	2	3	1	6 (86)
Water allocation	2	3	1	6 (86)

Figure 5.9 below shows the L2 respondents who indicated that the legislation mandates for RBO responsibilities. The Mozambique L2 respondents agreed that the legislation in the country provided the RBO with responsibilities for all the functions, except for the pollution control responsibility. Review of the 1991 WA indicates that the functions of the Regional Water Authorities are:

a) Participate in the preparation, implementation and revision of the basin **water plan**;
b) The administration and control of the public water domain and the creation and maintenance of the register of waters;
c) Collect water tariffs;
d) The **licensing and authorization** of water use;
e) Collect and keep updated hydrological data required for management of river basin;
f) Deal with conflicts;
g) Monitor policy and regulate unauthorized **sources of contamination**.

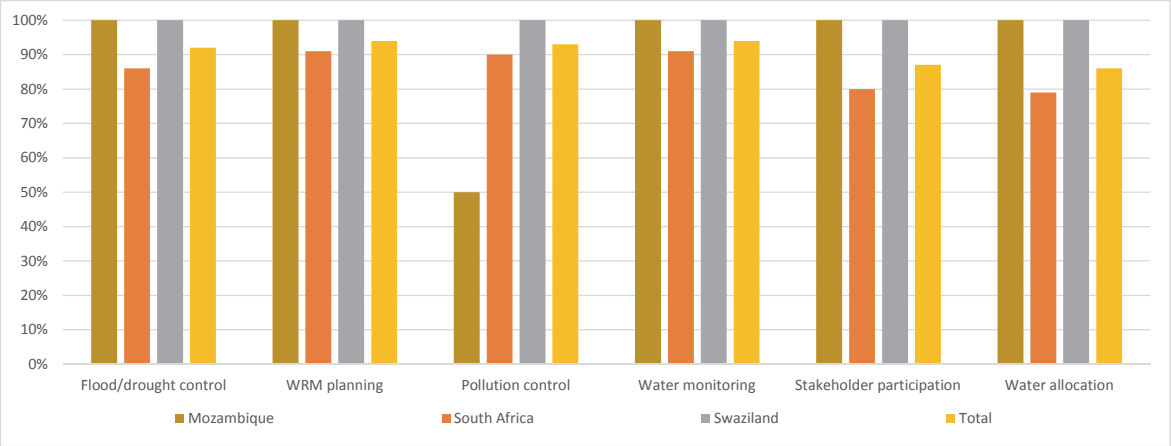

Figure 5.7: Positive responses from L2 respondents as to whether the RBO was mandated responsibility by the legislation to perform 6 key management functions

Country analysis of L2 respondents, further shows that from South African respondents were relatively certain that the RBO has the mandated function of water resource planning and water monitoring (91%); pollution control (90%); flood and drought control (86%) and stakeholder participation (80%). Fewer (<80%) of the respondents indicated the RBO had a legislative mandate for the water allocation function in the basin. The responses from both levels of SA do concur, with respondents largely indicating that the legislative mandate for water allocation was not that of the RBO. This is interesting as currently RBOs do not have a mandated role in water allocation, as this remains the responsibility of the central government. However, the legislation does grant the Minister the power to devolve responsibility of any of the functions to a RBO (as shown by respondents in Table 5.7).

The Swaziland L2 respondents all attributed the RBO with legislative responsibility for the six functions under review and felt that the legislation provided the Minister with the power to delegate these six functions to the RBO. This is in agreement with the response from the L1 respondent (as shown in Table 5.7).

On reviewing the new WA for Swaziland (2003), the Act assigns responsibility, with the approval of the Minister, the functions to:

a) keep a data base of basin information, including water availability and water demand data, and to monitor and keep record of changes in water conditions in the basin;
b) issue, amend and renew or suspend **water permits**;
c) impose water restrictions on all water users in times of **water shortage**;
d) investigate the need for water resources development and management and to advise the Authority on the need to appoint Project Boards;
e) investigate the need for inter-basin transfers, to negotiate it with other basin authorities, and to advise the Authority in respect thereof;
f) arbitrate user disputes;

g) monitor and control **water quality** and **enforce effluent regulations**;
h) subject to the approval of the Authority, to levy and collect rates and charge to defray part or all costs of the River Basin Authority;
i) have authority over Irrigation Districts, Project Boards and User Associations.

The Minister may alter, expand or reduce any of these functions from time to time.

5.4.1.3 FINANCING AND INCENTIVE STRUCTURES: ALLOCATING FINANCIAL RESOURCES TO MEET WATER NEEDS

Countries need smart financing approaches and appropriate incentives to achieve IWRM goals (GWP, 2004). Funds firstly need to be available for the basin management to operate on a sustainable manner (GWP and INBO, 2009). It is only once these funds have been identified and made available that basin management structures can fulfil its purpose. Most basin organisations have limited financial autonomy and depend heavily on allocations from central government budgets, as is the case of the CMA in SA.

According to the GWA and INBO (GWP, 2009) the financing for basin management covers three distinct areas:

1. **Stewardship of the resource**: includes (1) financing for institutional or non-structural activities (often referred to as 'soft' interventions) that make things happen and (2) funds for the routine tasks and maintenance that must be done to keep the basin healthy;
2. **Developing and maintaining infrastructure**: includes (1) developing and managing water resources infrastructure (i.e. building storage dams and dykes, etc. and (2) developing and providing infrastructure for water services;
3. **Operations of the basin organisation**: includes finance for operations of the basin organisation, whatever form these organisations take.

Because basin management is a public good it will mainly be funded from public sources. There are generally 3 types of revenue available to a basin management organisation, namely (GWP, 2009):

1. **taxes**: which are an indirect source of funds and may be raised in many different ways from citizens and businesses;
2. **tariffs** (and other charges): recovered directly from citizens and businesses that benefit from the services provided by the basin organisation. Can take the form of user charges for water use, payments for pollution (polluter-pays principle) and other charges;
3. **transfers:** include grants, and charitable and voluntary contributions.

In addition, financing for basins can be shared by more than one country in certain cases.

Once the funds are planned and available for the RBO, it is important to develop and implement the other appropriate financial systems which could support the activities of these organisations,

such as the 'polluter-pays' and 'user-pays' principles, both of which are key elements of the IWRM approach and key aspects of the policy and legislative framework of the case study countries.

Literature on the financing of IWRM in Mozambique shows that water revenues, where collected, are making an increasingly important contribution to WRM in the country (UNEP 2012). According to the UNEP (2012) Mozambique indicated that *"It is acknowledged that three out of five RBOs show positive increases on their revenues, and this is mainly due to: i) investments in water infrastructure which has attracted more development investments; ii) increasing registration of water users in the basin organizations' jurisdictions; iii) water users have been strongly sensitized on the economic value of water and the need to pay in line with the current water legislation; and iv) the revision of water tariffs*".

Currently in SA, the two RBOs are entirely funded through taxes collected by the national fiscus (Pearce et al. 2014). In future, RBOs are expected to balance this funding from central government with funds from the collection of water tariffs/charges in the river basin. Raw water charges are currently determined by DWA, while bulk water and local user charges are determined by Water Boards and local government. These charges are managed by various strategies and regulations. In future, it is expected that the RBO will determine raw water charges, but DWA will continue to regulate and monitor these charges.

The vision for the Swaziland RBOs is to be self-sustaining entities (Manyatsi and Brown, 2009). The WA mandates a RBO to develop its own water pricing structure and stipulates that a RBO can "levy and collect rates and charge to defray part or all costs of the River Basin Authority". Manyatsi and Brown, (2009) indicated that the implementation of a pricing mechanism to cover RBO operational and developmental plans will likely be met with some resistance until demonstrable benefits are observed on how the collected funds are effectively utilised. It is thus likely that national government will, for many years, have to provide for shortfalls in income generation by RBOs.

WATER FINANCE INPUTS FROM THE STAKEHOLDERS IN THE CASE STUDY

RBO COLLECTION OF TARIFFS/CHARGES

From a charge/revenue generation perspective, respondents in the Inkomati survey were asked whether RBOs collected user charges/revenue. Table 8 below shows the number of L1 respondents on the collection of user charges/revenues by RBOs. A small group of L1 respondents (43%) indicated that RBOs were collecting user charges/revenues in the IRB, while the other L1 respondents (57%) gave a negative or don't know response on the issue.

Table 5.8: Number of L1 respondents on the user charges or revenue collection by RBO

Responses	Country			Total (%)
	Mozambique	South Africa	Swaziland	
Yes	2	1	0	**3 (43)**
No	0	2	1	**3 (43)**
Don't know	0	1	0	**1 (14)**
Total	**2**	**4**	**1**	**7 (100)**

The country analysis indicated that both the South African L1 respondents were split 50% positive and the other 50% negative or unsure on this issue. Mozambique L1 respondents indicated that the RBO collected charges/revenue and when further asked to elaborate more on the issue, *they indicated that the charges/revenues were chiefly on a monthly basis with the destination of the funds being national government and the RBO*. These results support the results of the UNEP (2012) study.

Swaziland L1 respondents indicated that the RBOs were not collecting user charges/revenues, simply because the RBOs are not yet established in Swaziland. Figure 5.10 below shows the L2 respondents on the water charges/revenues collection issue. The large majority of L2 respondents (69%) disagreed on the RBOs to be collecting user charges or revenue in the IRB. While only a small group of respondents (26%) agreed and (5%) did not know whether RBOs were the primary collectors of user charges or revenues in the IRB.

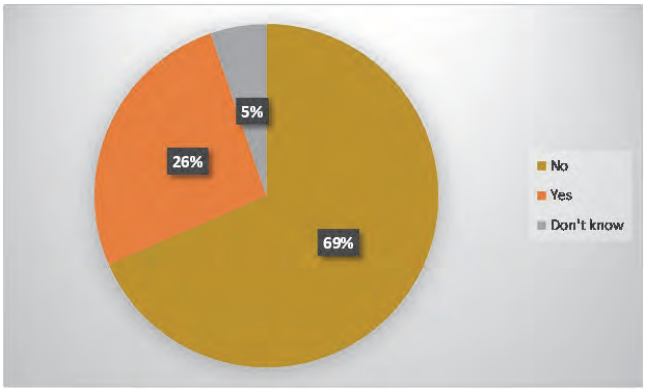

Figure 5.8: Percentage distribution of L2 response to whether a RBO collect water charges/revenue

The country analysis on the L2 responses supported the L1 respondents, showing a large percentage of L2 South African (73%) and Swaziland (83%) respondents indicated that water user tariffs/charges were not collected by the RBO. When further asked them to elaborate more on the issue, *they specified that these funds were being collected monthly or on an annual basis and the destination of the funds was largely to national government.* Mozambique L2 respondents concur the responses given by the L1 respondents and indicated that the RBOs collected charges/revenue on a monthly.

CHANGE IN RESPONSIBILITY FOR TARIFF COLLECTION

Respondents were also asked to provide some indication of changes in responsibility for tariff collection from the time before the RBO was established to the current RBO situation.

Table 5.9 shows that Mozambique L2 respondents felt there had been a shift of responsibility from the national government to the RBO. This supports the finding of the UNEP (2012) study, where respondents in that study indicated that there had been a positive increase in revenue in the RBOs of the country. However, the South African respondents showed no major shift in responsibility (in fact very few respondents answered this question).

Table 5.9: L2 respondent assessment of the shift in responsibility of water tariff collection before and after the establishment of the RBO

Organisation	Country					
	Mozambique		South Africa		Swaziland	
	Before	After	Before	After	Before	After
Not applicable	100%					
National			55%	55%	83%	17%
Provincial			18%	18%		
National agency			9%			67%
RBO		100%				

Financial capacity of local stakeholder institutions

At a local financial management level, respondents have indicated that a number of local WRMIs have been development in the IRBs. Respondents were asked whether these local institutions have sufficient financial capacity, with 5 of the six L1 respondents indicating that these local stakeholder WMI have insufficient financial resources to implement IWRM. Only a very small (29%) percentage of L2 respondents indicated that they thought these local institutions had sufficient financial capacity. This can largely be attributed to the 56% of South African L2 respondents that felt there were sufficient financial resources for local institutions.

5.4.1.4 SUMMARY OF KEY FINDINGS RELATED TO THE IWRM ENABLING ENVIRONMENT IN THE INKOMATI CASE STUDY

Based on the secondary and primary data collected in this study, it is clear that all three countries have water polices and legislations, which are based on the IWRM principles. It is thus seems that it is not the policy or legislative framework that may be hampering progress of IWRM and decentralisation in these countries, but the cause could rather be the implementation of the policies.

Respondents from all 3 countries largely agreed that water policies were in place for water allocation and that policies in the basin were in line with IWRM principles. Respondents were also aware of water monitoring and pollution control policies. Furthermore, respondents felt current policies contributed to the decentralisation process in the country.

Stakeholder participation is seen as a key aspect of the various water management policies in the 3 countries. Respondents largely recognised that legislations mandated RBOs responsibility for water monitoring and stakeholder participation in the basin. Water allocation responsibilities were largely recognised as not being delegated to RBOs, however respondents acknowledge that the Minister had the legislated mandate to delegate any functions to the RBOs, which are largely financed from the national fiscus.

5.4.2 IWRM INSTITUTIONAL ROLES

The development and structuring of the most appropriate institution for management of water in a river basin is crucial for the formulation and implementation of IWRM policies and programs (GWP, 2004). A number of factors determine what an appropriate institution is in a given context. For example; stage of development, financial and human resources needed and available, traditional norms, etc. (GWP, 2004). A review of the river basin institution involves consideration of a whole range of formal rules and regulations, customs and practices, ideas and information, and interest or community group networks (GWP, 2004). Key considerations when reviewing the institutional roles of IWRM management in a river basin of this study are:

- the structure of the **organisational framework** including issues of institutional arrangements, roles and responsibilities;
- the extent of and means for **stakeholder participation** in the IWRM institution;
- the **capacity** of these institutions to perform their assigned IWRM functions. Institutional capacity also relates to the organizational framework and the implementation capacity within that framework, as well as the capacity to implement mechanisms for dispute resolution in the context of IWRM.

This section of the report outlines the extent to which the 3 countries in the case study have been able to establish the political, social, economic and administrative systems needed for managing the development and use of water resources.

5.4.2.1 CREATING AN ORGANIZATIONAL FRAMEWORK: FORMS AND FUNCTIONS

According to GWP (2004) creating an organization framework for implementation of IWRM in a river basin starts with the reform of institutions for better water governance and then requires that practitioners consider the required organizations and institutions, from country to basin level and from regulator to water users. The IRB has seen the formation of a number of international and local organisations/fora to support trans-boundary cooperative management of the basin. The Tripartite Permanent Technical Committee (TPTC) is a collaborative committee between the three countries in the IRBs.

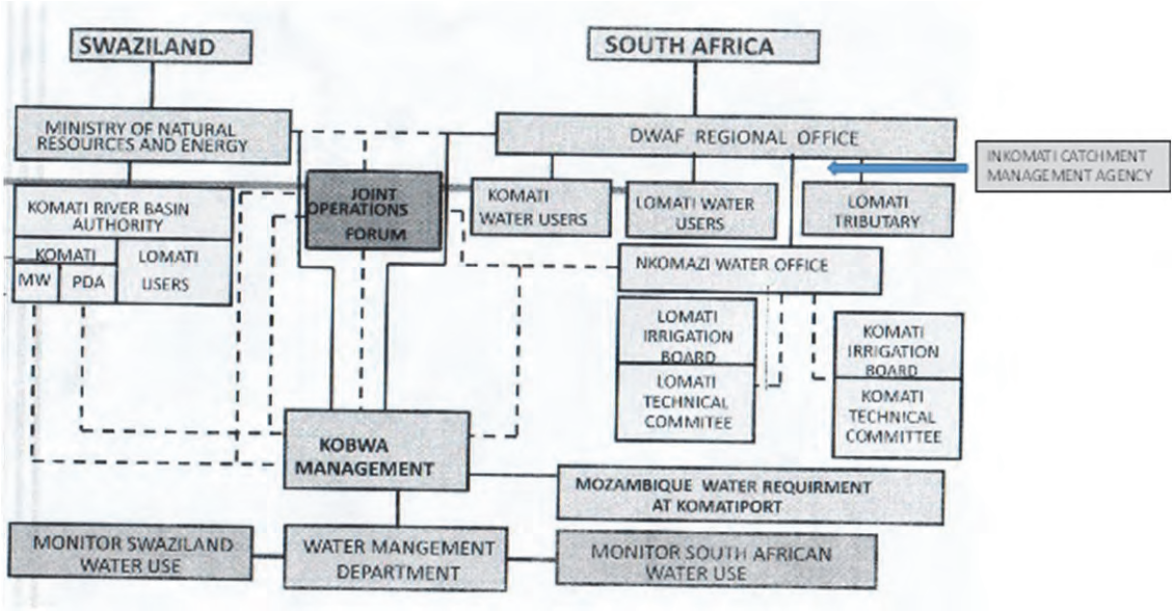

Figure 5.9: Water management organisations in the Swaziland and South Africa IRB (provided by KOBWA)

Figure 5.11 shows the chief water management framework in the IRB, on the Swaziland and SA parts of the basin. The chief point of engagement between the management structures of the countries is the Komati Joint Operations Forum, which comprises of representatives of national water departments from SA and Swaziland, as well as water-user representatives. The Forum meets to discuss matters relating to the operation of the river system.

The Komati Basin Water Authority (KOBWA) is a bi-national company formed in 1993 between Swaziland and SA, to action the treaty on the Development and Utilization of the Water Resource. The purpose of KOBWA is an implementation one on behalf of both countries i.e. implementation of the Komati River Basin Development Project to design, construct, operate and maintain the Driekoppies Dam in SA and the Maguga Dam in Swaziland (http://www.kobwa.co.za/)

Literature indicated that in all 3 countries which form part of this study, water use is regulated by a central water-management body within a particular national government ministry (Slinger et al., 2010). This is the DWA in SA, the National Water Directorate (DNA) in the Ministry of Public Works and Housing (MOPH) in Mozambique, and the Water Resources Branch within the Ministry of Natural Resources and Mining in Swaziland.

The daily water management activities within the IRB are delegated to decentralized bodies such as RBOs. The case study countries envisage the formation of Irrigation Districts and Water User Associations for localised management by authorised users with common water interests. These structures are still very much being formalised in the case study area, although SA has seen the enacting of a number of WUAs within and surrounding the IRB.

INSTITUTIONAL ARRANGEMENTS IN THE INKOMATI CASE STUDY

Respondents in the survey were asked whether they felt institutional arrangements were in place in the IRB to support IWRM. The majority, 5 out of 7 L1 respondents (71%) indicated that the institutional arrangement were in place to support IWRM in the IRB. The other two respondents indicated that not all the arrangements were in place (SA) and that only the framework was in place (Swaziland).

Figure 5.12 shows that a large majority of the L2 respondents also alleged that these institutional arrangements were in place. Respondents who did not feel these arrangements were in place attributed this to the fact that *there is a lack of transparency in the role of other governmental stakeholders, i.e. Department of Agriculture, Department of Health, Department of Environmental Affairs, in achieving the IWRM objectives. WUA's are not yet established in the SA, although they have applied, many years ago. The RBO does not appear to be properly empowered, though, acknowledges Irrigation Boards as legal WMI's (SA).*

In Swaziland, respondents specified that the RBO still not yet well established. Furthermore, even respondents who believed the institutional arrangements were in place indicated that the process in all 3 countries is moving relatively slowly.

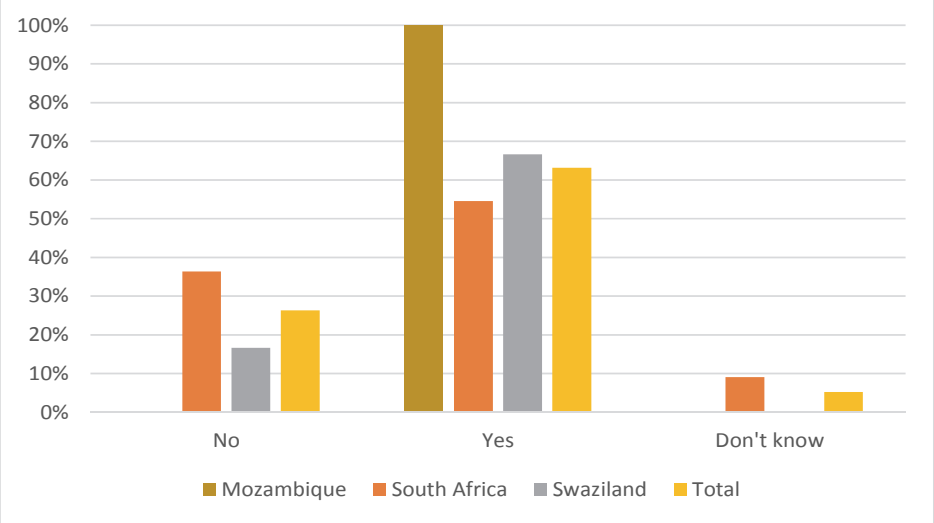

Figure 5.10: Perception of the L2 respondents indicating whether institutional arrangements were in place in the IRB to support IWRM

PROCESS FOR ESTABLISHMENT OF RBOS

Related to the principle of decentralisation and the maximising of stakeholder participation in the establishment of the RBOs, respondents were asked how they perceived the process of RBO establishment, with the majority of respondents indicating a top-down or top-down-bottom-up (4

respondents) process. The majority of L2 respondents indicated that it was either a top-down driven process or a two-way process of a combination of top-down and bottom-up (Figure 5.13).

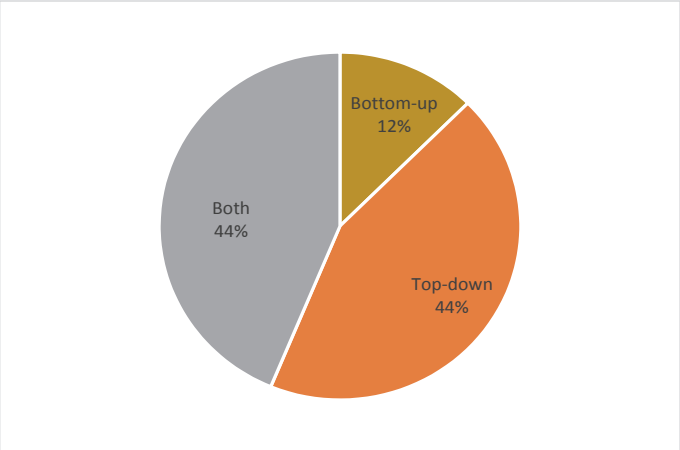

Figure 5.11: L2 respondents perceptions of the process followed for the establishment of RBOs in the three countries

All the L1 and L2 respondents from Mozambique indicated a top-down process to establishment of the RBOs. The L1 respondents from SA felt the process was top-down-bottom-up , while L2 respondents were not strongly in agreement on any of the options with a third indicating a top-down-bottom-up process and another quarter of respondents indicating a bottom-up process. The L1 Swaziland respondent and two-thirds of the L2 respondents indicated a top-down-bottom-up process, while the remainder felt the process was top-down. One could thus conclude that respondents in Mozambique view the process of establishments of RBOs as a central government, top-down process, while South African and Swaziland respondents view the process largely as either a top-down driven or a top-down-bottom-up process with coordination of national government efforts with local basic efforts. One of the SA respondents explained the top-down-bottom-up coordinated process as *at that time, the Minister saw an urgent need to form institutions that will ensure DWA mandate is carried out. During the process, it was realised that things need to revert back to the drawing board since most stakeholders did not buy in to the '"down to throat" approach. It was later realised that a bottom-up process needs to be urgently followed to hear the needs of the various stakeholders having diverse needs and diverse water utilisation programmes.*

RESPONSIBILITY FOR ESTABLISHMENT OF RBOS

Despite South African and Swaziland respondents indicating a range of processes for the establishment of the RBO, all the L1 respondents and the majority (75%) of L2 respondents indicated that the RBOs were established by government (assuming national government).

This holds true for the country analysis which showed that the Mozambique respondents indicated that government was responsible to establish RBOs, confirming the above results that the establishment of the RBOs was a top-down process in the country.

The L1 respondents and 67% of the SA also indicated that the RBO was created by the national government. Similarly the L1 and 87% of the Swaziland respondents indicated that government created the RBOs in the basin. Despite South African and Swaziland indicating a top-down-bottom-up process for establishment of the RBOs, these institutions are currently still largely viewed as being created by government and not stakeholder created institutions.

EMPOWERED TO PERFORM FUNCTIONS

Respondents in the IRB survey were asked whether these RBOs were empowered to perform their functions. There seems to be consensus, from both levels of respondents in Mozambique and SA, that RBOs in the IRB are empowered to perform their functions. However, in the Swaziland sample respondents did not respond to this question since decentralisation is still in the initial stages and the RBOs are still being established.

PERFORMANCE OF FUNCTIONS

In an assessment of the performance of the relevant RBOs in the IRB, Figure 5.14 shows that only a small percentage of L2 respondents from SA felt that RBOs were not performing their functions at all. The large majority of respondents for all 3 countries indicated that river basin organisations were performing some of their functions. It should be noted that these two criteria could be interpreted to mean the same thing. Very few of the respondents felt the RBOs were performing all their functions, with responses in this category only coming from SA and Mozambique.

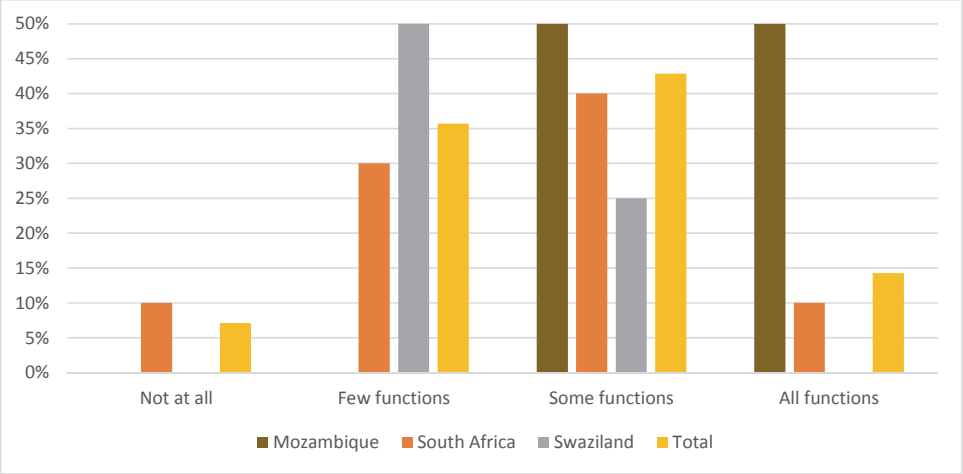

Figure 5.12: L2 responds assessment of performance of the RBOs function across the 3 countries in the IRB

PRESENCE OF LOCAL STAKEHOLDER INSTITUTIONS

Despite RBO activities still being in the early stages of formalization in the 3 countries, it is interesting that all the Mozambique and SA L1 respondents and the majority of L2 respondents (75%) indicated that local stakeholder-based WMI had been created in the IRB. These respondents indicated that these stakeholder WMI included:

- **Mozambique:** Basin Committee and Association of irrigations, communities, enterprises, local government;
- **South Africa:** catchment management forums have been established that discusses various issues ranging from operations and management, even a trans-boundary forum where stakeholders from the three countries are represented e.g. Komati Joint Operations Forum (KJOF);
- **South Africa:** Crocodile Catchment Forum, TSB, SAPPI;
- **South Africa:** AWARD, TRIP, & Elands WUA, Crocodile Catchment Forum and equivalent forums in other sub-catchments, Inkomati Irrigation Forum (IIF), ICMA and WUA (SA); and
- **Swaziland:** Emandla Ekuphila Water District.

AUTONOMY OF RBO

Respondents were requested to provide their opinion as to the independence of RBO to performance of water management functions. Survey results indicate that all the L1 and a very low percentage (38%) of L2 respondents felt the RBO had autonomy to perform their WRM function, with 82% of respondents indicating that government delay RBO decision in the IRB. Just less than two-thirds of the respondents indicated that these delays by government could have a severe impact on the service delivered by the RBO.

At a country level, interestingly both the Mozambique L1 and L2 respondents felt that the ARA had the autonomy to perform its water management functions, while a low percentage of the South African (37%) and Swaziland (25%) L2 respondents showed similar confidence in the autonomy of the RBO. All L1 and L2 respondents in Mozambique and Swaziland L2 respondents felt that government delays the RBO decisions, while 80% of the SA L1 and L2 respondents indicated delays by government. The Mozambique L2 respondents indicated that these delays would only have a moderate impact on the service delivered by the RBO, while most of the South African (86%) respondents felt the impact of these delays would be severe. The Swaziland respondents indicated that the impact would be from moderate to severe.

5.4.2.2 STAKEHOLDER PARTICIPATION

Stakeholder participation in water management in a basin should include all stakeholders in the horizontal structure of the WMI, but should also include horizontal partners in the institution. This implies that water management in a basin should include role players from the individual user to the national regulator, as well as various partners at each level. These stakeholders need to have a voice in water planning and management, with particular attention to securing the participation of women and the poor (Manyatsi and Brown, 2009).

More than half of the L2 respondents in the Inkomati survey indicated that RBO had performed relative well in their stakeholder participation responsibility (see Section 5.2.1.). RBOs are expected to engage on water management decisions with water stakeholders from national

government-level down to the individual water user and stakeholder. Similarly, RBOs need to engage horizontally with water service authorities, other sector departments, private sector, etc.

DEPARTMENT PARTICIPATION IN THE OPERATIONS OF THE RBO

From the perspective of RBOs facilitating horizontal participation of stakeholders in water management in the IRB, respondents in the survey were requested to determine the extent to which other sector departments are involved in the operation of the RBOs. Although limited data was available, the majority (more than half) of L1 respondents indicated relatively low (≤50%) involvement of departments in RBO operations.

Table 5.10 shows that L2 respondents indicated a range of levels of involvement of various departments in the operations of the RBO. Although over half the Mozambique L2 respondents showed a high level of involvement of environment, local government and international affairs in the operation of the RBO, no conclusion can be drawn from this as the sample was very small (2 individuals).

Table 5.10: Percent of L2 respondents reporting weak or high involvement of various departments in RBO operations

Country	Department	Percentage of L2 respondents		
		Weak involvement ≤50%	High involvement >50%	N/A
Mozambique	Environmental department	50%	50%	
	Mining and Energy department	100%		
	Treasury			100%
	Local government	50%	50%	
	International affairs	50%	50%	
South Africa	Environmental department	57%	43%	
	Mining and Energy department	88%		12%
	Treasury	50%		50%
	Local government	100%		
	International affairs	40%		60%
Swaziland	Environmental department	40%	40%	20%
	Mining and Energy department	40%	20%	40%
	Treasury		40%	60%
	Local government	50%	25%	25%
	International affairs	60%		40%

Over a third of the South African L2 respondents indicated a relatively high level of involvement in operation of the RBO by the department of environmental.

L2 Respondents in Swaziland, although only 40% of these, believe there is high involvement by the environmental department and treasury in the operations of the RBOs. What Table 5.9 does

show however, is that almost all departments are involved in RBO operations, although in many cases it is weak involvement.

PRIVATE SECTOR INVOLVEMENT IN RBO FUNCTIONS

Respondents were also requested to indicate their perception of the level of private sector involvement in 5 RBO operational activities. Table 5.11 shows that a large percentage of respondents indicated involvement of the private sector in all responsibilities of the RBO. At a country level, most of the L2 Mozambique respondents indicated weak involvement of the private sector in water treatment, water supply, reservoir construction and water quality monitoring.

A high percentage of the South African L2 respondents indicated weak involvement of the private sector in water supply and maintenance. A small percentage of these L2 respondents indicated high involvement in water treatment and water quality monitoring. This could perhaps be attributed to the fact that, in many areas of SA the role of water service provision, although a local government responsibility, is often supported by a professional service provider from the private sector. These services would be linked to both a water treatment and water quality monitoring function in the basin. A high percentage of respondents in the Swaziland L2 survey indicated high involvement of the private sector in all the RBO responsibilities. To gauge individual's (vertical) participation in WRM in the IRB, respondents were asked whether they knew how often catchment meetings were called, whether they attend these and what the level of stakeholder involvements was in the meetings.

Table 5.11: Percentage of L2 respondents reporting weak or high involvement of the private sector in the various RBO responsibilities

Country	RBO Activity	Percentage of L2 respondents		
		Weak involvement ≤50%%	High involvement >50%	N/A
Mozambique	Water treatment		50%	50%
	Water supply	100%		
	Maintenance	50%		50%
	Reservoir construction	50%	50%	
	Water Quality	50%		50%
South Africa	Water treatment	50%	50%	
	Water supply	66%	34%	
	Maintenance	63%	34%	
	Reservoir construction	57%	43%	
	Water Quality	34%	66%	
Swaziland	Water treatment	100%		
	Water supply	100%		
	Maintenance	60%	40%	
	Reservoir construction	100%		
	Water Quality	100%		

INDIVIDUAL PARTICIPATION IN BASIN MANAGEMENT

The majority of L1 respondents indicated that catchment meetings were called on a monthly, twice a year or when the need arose. The Mozambique respondents agreed that these meetings were called twice a year, while the Swaziland L1 respondent specified that the meetings in the basin were called when the need arose. The South African L1 respondents showed no consensus as to when meeting were called, specifying that meetings are called monthly, quarterly or other.

Just over half of the L2 respondents indicated that catchment meetings were called on a quarterly basis. The respondents in the individual countries showed similar results, with approximately half of respondents indicating a quarterly call for catchment meetings. There seems to be little consensus between L1 and L2 respondents and between respondents in the 3 countries on how often catchment meetings are held in the basin. A relative high percentage (79%) of Level respondents indicated that they attend these meeting, with approximately 80% of the South African and Swaziland respondents indicating their attendance and one of the Mozambique respondents stating that they attend the meetings.

STAKEHOLDER PARTICIPATION IN CATCHMENT MEETINGS

In their assessment of the level of stakeholder participation in these meetings, two-thirds of the L1 respondents indicated that stakeholder participation was 50%, where half the stakeholders participated all the time or all the stakeholders participated half the time. The Mozambique and South African responses to stakeholder participation followed a similar outcome.

L2 respondents however, rated the stakeholder participation between 50% and 100%, with Mozambique L2 respondents at the lower end of the scale and Swaziland L2 respondents rating participation at the higher end of the scale. The South African respondents showed an almost 50:50 split between those that rated participation as partial (50%) to comprehensive participation (100%).

ISSUES ADDRESSED IN CATCHMENT MEETINGS

Respondents indicated that the issues that are frequently discussed in the meetings ranged from some (general) water issues to purely important water issues.

L1 respondents indicated that the level of time spent on none-important water issues was between 10 and 50 % and on important water issues was between 50-100% of the meeting's time allotment. Issues discussed under these were detailed as:

- **Mozambique:** most frequently speeches about water uses, the problems of the basin and prognostics for both seasons (Winter and Summer) for Planning the Floods and Drought
- **South Africa:** Municipalities always complain about their sewage system; discussion on water quality, water pollution, water conservation and water services issues.
- **South Africa:** Reserve Determination; Water Resource Classification; Water Allocation and Equitable Use; Water quality protection

- **South Africa:** PPP's Strategies, policies, budgets
- **Swaziland:** setting up, money and sector issues

5.4.2.3 Institutional capacity building – developing human resources

Once the institutional framework for IWRM has been determine, there may be a need to develop and upgrade the skills and understanding of various role players in this institution, including decision-makers and management and professionals in these organisatons (GWP, 2004). Capacity –building then needs to be initiated for all levels of the institutions i.e. regulator to water uses.

According to Manyatsi and Brown (2009) in Swaziland *the formulation of the revised IWRM Plan is still a work in progress and such progress has been hampered by capacity constraints within water professionals in the country. Much of the technical capacity to collect, collate and develop strategies is limited to a few individuals*. Similarly, the human capacity may not be available to introduce economic water accounts and IWRM capacity may also be limited in the country.

LOCAL CAPACITY OF WMI

At a local management level, respondents in this study of the Inkomati, indicated that a number of local WMI have been developed in the IRBs. Respondents were asked whether these local institutions have sufficient human resources capacity to implement IWRM.

Four of the six L1 respondents, mostly from the South African sample, indicated that these intuitions had insufficient capacity to implement IWRM. Similarly only a small (44%) percent of L2 respondents indicated that they thought these local institutions had sufficient financial capacity to implement IWRM. Both of the Mozambique L1 respondents indicated that these institutions had sufficient human capacity. Interestingly, the L2 respondents from Mozambique indicated the opposite of the L1 counterparts in that both respondents felt that there was insufficient human capacity for a local stakeholder water management institution.

From a South African perspective, just under two third (60%) of the L2 respondents indicated that there was sufficient human resource capacity at the local institution level. In the case of the Swaziland respondents, only a third of respondents indicated similar confidence in levels of human capacity within these local institutions. Those respondents which indicated there was insufficient human capacity for local institution attributed this to:

- **South Africa:** DWA lacks human resource capacity
- **South Africa:** General shortage of experience and skills within RBO
- **Swaziland:** Lack of people trained in water management

Capacity building was not a criterion which was extensively measured in this assessment of the IRB. Since the institutionalising of RBOs is still in the formative stages in all 3 countries

included in the case study, it is perhaps premature to assess capacity building efforts in these organisations. However, RBOs should include this aspect of IWRM as part of their functions and should, at the formative stage of the organisation, assess the capacity required to ensure a sustainable functioning organisation. The long-term objective should be to develop a capacity building plan to address the needs and gaps which emanate out of the capacity assessment.

5.4.2.4 Summary of key findings related to the institutional framework in the Inkomati case study

Based on the secondary and primary data collected in this study, it is clear that the regulation of IWRM implementation and the decentralisation process in the 3 countries is by central government. Respondents largely indicated that the institutional arrangements were in place to implement IWRM in the river basin; though progress in implementation was slow.

Local level stakeholder WMI are largely seen to have been established in the IRB and the stakeholder participation ranged from moderate (Mozambique and SA) to comprehensive (SA, Swaziland). In Mozambique and SA, respondents have indicated that the RBO is empowered to perform their legislated functions but the government is delaying decisions in the IRB. In Swaziland, RBO is not yet empowered to perform their legislated functions, yet the process of establishment of the RBO was largely believed to be a two-way process (top-down: bottom-up).

5.4.3 IWRM MANAGEMENT INSTRUMENTS

According the WSSD Implementation Plan countries implementing IWRM need to e*mploy the full range of policy instruments, including regulation, monitoring, voluntary measures, market and information-based tools, land-use management and cost recovery of water services, without cost recovery objectives becoming a barrier to access to safe water by poor people, and adopt an integrated water basin approach.*

The GWP (2004) outlines management instruments *are the elements and methods that enable and help decision makers to make rational and informed choices between alternative.* Management instruments include country or situation specific tools such as preparedness for water related disasters and improved decision making. Management systems may however, be impacted by lack of data or info exchanged or by underperforming institutions (UNEP, 2012).

The art of IWRM is about knowing the available elements and methods and selecting, adjusting and applying the mix appropriate to the given circumstances. Assessment of IWRM instruments in the IRB includes assessment of performance of:

A. Assessment instruments
B. Plans for IWRM
C. Demand management procedures and processes
D. Mechanisms for dispute resolution

E. Regulatory instruments
F. Information management system

5.4.3.1 WATER RESOURCES ASSESSMENT: UNDERSTANDING RESOURCES AND NEEDS

This IWRM change area includes the collection, reporting and monitoring of hydrological, physiographic, demographic and socio-economic data (GWP, 2004). Assessment of resource requires the development and implementation of monitoring systems, including water and water quality and quantity monitoring. Monitoring and information systems to support IWRM decision making, evaluation and review of water resources will be critical in achieving sustainable water resource development and utilisation. IWRM decision has to be based on up-to-date data and information (Manyatsi and Brown, 2009).

The need to incorporate environmental concerns into planning was one of the strongest recommendations of the United Nations Conference on the Human Environment (Stockholm, 1972). The 1992 United Nations Conference on Environment and Development (Earth summit) also outlined in Agenda 21 that this is the main areas for integrating environment and development in policy, planning, management decision-making as well as the legal and regulatory framework concerned. Reducing the burden of environmental impacts is necessary if development is to become sustainable. An environmental impact assessment (EIA) is a management tool for planners, designers and decision makers and complements other project studies on engineering and economics. Worldwide, environmental assessment is now accepted as an essential part of development planning and management.

Manyatsi and Brown (2009) indicated that the only effective instrument in Swaziland to ensure that IWRM principles are considered is the implementation of the Environmental Management Act, which requires that for almost all water resource development projects, is that environmental impact assessments (EIAs) are carried out to identify the core environmental challenges and opportunities.

Similarly, SA environmental legislation requires that any scheduled activity that requires environmental authorisation conduct some level of EIA. EIAs thus could be a vital planning tool in a river basin IWRM and could also provide invaluable information and monitoring data to the RBOs. Unfortunately the use and contribution of EIAs in IWRM in the IRB was not captured in this survey. The Inkomati survey did ask respondents whether they were aware of the RBO monitoring of water quality in the IRB. The majority, 6 out of 7 L1 respondents, from Mozambique and SA indicated that the RBO monitors water quality in the basin.

L1 respondents indicated that the determinants, which were monitored by the RBO included dissolved oxygen and temperature (3 respondents) and pH, suspended and conductivity (4 respondents). Other determinants included in the water quality monitoring were microbial, *E. coli*, nitrate and phosphates. Many of these determinants can be linked to the key source of pollution in surface waters, namely agriculture (fertiliser) and wastewater treatment works. In the

case of L2 respondents, just over half (53%) indicated that they knew that there was water quality monitoring by the RBO.

5.4.3.2 PLANS FOR IWRM: COMBINING DEVELOPMENT OPTIONS, RESOURCE USE AND HUMAN INTERACTION

River, aquifer and lake basin planning entail a comprehensive assembly and modelling of data from all relevant domains. The planning process must recognise social, economic and environmental needs using a range of assessment tools (GWP, 2004). As signatory to Agenda 21 and adopters for the WSSD action plan, Mozambique, SA and Swaziland are required in accordance with Paragraph 26 of the WSSD Plan of Implementation to *develop IWRM and water efficiency plans by 2005, with support to developing countries, through actions at all levels.*

Indications are that Mozambique is formulating an IWRM Plan. SA on the other hand has seen the development of provincial level IWRM Actions Plans, but no similar plan at a national level. However, the development of a National Water Resource Strategy is a legislative requirement in the country. The second NWRS, published in 2013, does outline SA's vision and actions to implement IWRM in the country.

The WA of Swaziland makes provisions for the development of an Integrated Water Resources Master Plan (IWRMP) which needs to contain an inventory of the total water resources of Swaziland and a comprehensive programme of actions (Government of Swaziland, 2003). Swaziland is in the process of developing an IWRMP, with a draft version of the report released in October 2010 and the review process is underway. The IWRMP emphasises the fact that WRM in Swaziland takes place entirely in a trans-boundary context with resulting potential limitations to the development and expansion of water resources use in the country (UNEP, 2012). Unfortunately the Inkomati survey did not capture details related to this particular change area of IWRM.

5.4.3.3 DEMAND MANAGEMENT: USING WATER MORE EFFICIENTLY

Demand management involves the balancing of water supply in the basin with the demand for water from the resource (GWP, 2004). Demand management requires understanding the current water supply in a basin, determining the demand for water and utilising these to better manage water withdrawals and reducing excessive use. The focus of demand management is on maximising the effective and efficient use of existing water supplies rather than developing new ones (GWP, 2004). Scarcity and overexploitation of water resources were highlighted as key issues by interviewees in Mozambique in the UN (2012) assessment of IWRM. Therefore, demand management is a key to addressing these issues.

According to Manyatsi and Brown (2009) water use information in Swaziland is generally lacking. Irrigation water use in the country is monitored through the permitting system, however, actual volume of water use is poorly monitored and this data is difficult to access. National data on water use, which is the responsibility of DWA, was last captured in 1996. Similarly, data is available for some sectors but not for others. At a basin scale, the River Basin Authorities are

responsible for monitoring water use and demand on an ongoing basis and to develop and implement a database to store and report this information. Water demand management has many benefits to the water resource, RBO and the water user; see the example shown in Box 5.2.

Box 5.2: Example demonstrating the benefits of water demand management in Swaziland taken from Manyatsi and Brown (2009)

The benefits of water demand management have been realised by the Royal Swaziland Sugar Corporation that has over 20,000 Ha of sugarcane under irrigation. Water for irrigation at Simunye Estate is supplied from Mnjoli dam on the Mbuluzi River that has limited potential for further development of storage, and the river is shared with Mozambique. After realising that there was need to reduce demand thereby making water available for expansion the Royal Swaziland Sugar Corporation decided to replace approximately 7,000 Ha of dragline sprinkler system with subsurface drip irrigation. Water use efficiency was considerably better with the subsurface drip irrigation could be utilised for expanding the area under irrigation. Another industry that uses a lot of water is the Swaziland Beverages, which uses about 17,000 Kℓ per month. The industry discharges for treatment about 136,000 Kℓ per month. The company responded to the high water usage combined with high water prices in the country (US$ 1.13/m3 in Swaziland compared to US$ 0.22/m3 in Zambia) by reducing water usage in order to cut costs of production.

SA has introduced and implemented national efforts for water conservation and demand management. The country is serious about demand management of water resources and has, as a result, developed a Water Conservation and Demand Management Strategy for the country (DWAF, 2004). Similar to Swaziland, DWA is responsible to collect and report demand data for the country and to manage a regional information management system to store, manage and report this data. CMAs and Water Service Authorities have a role to play in managing and reporting water demand data within their jurisdiction.

SA's water reconciliation data is outdated, with recent documents such as the NWRS2 utilising 2000 data to report water availability and demand in the catchment areas of the country. However, DWA in partnership with other institutions does keep and maintain Water Reconciliation Strategies for key water areas of the country, but not for the IRB.

Respondents in this study of IWRM in the IRB were asked whether the CMA monitors water use in the basin. Most (6) of the L1 respondents indicated that the RBO does monitor water use in the basin, half (3) of which indicated that they received water use monitoring reports on a monthly basis. The Mozambique L1 respondents were positive on both of these aspects of water use monitoring, while the Swaziland L1 respondent indicated that no water use monitoring was being conducted by the RBO. Similarly, the majority (83%) of L2 respondents were equally positive that water use monitoring was being conducted by the RBOs. However, only one L2 respondents from Mozambique and Swaziland indicated that they were aware of this monitoring taking place.

5.4.3.4 CONFLICT RESOLUTION: MANAGING DISPUTES, ENSURING SHARING OF WATER

Mechanisms for managing conflict are key criteria in IWRM as conflict is endemic in the management of water in many places. Mechanisms for managing conflict may include resolution models (GWP, 2004). In the assessment of IWRM in the IRB, respondents were asked whether there are forums to hear disputes and how often these forum meet.

Results of the survey indicate that 4 of the L1 respondents and 56% of L2 respondents mentioned that there was a forum for disputes, with the majority of these respondent indicating that the forum meets when the need arises (41% of respondents) or on a quarterly basis (33% of respondents). From the perspective of the individual countries, only L1 respondents from Mozambique and SA indicated the presence of a forum to address disputes. The Swaziland L1 respondents indicated that no such forum was available.

All the South African and Mozambique L2 respondents indicated a dispute forum is in place. Interestingly, similar to the result from the L2 respondent, 83% of the Swaziland L2 respondents indicated no such forum in place for dispute resolutions.

South African respondents indicated that the main types of disputes/issues rose in the forum included: *water licence; water issues (ground vs. surface water); water pricing; re-allocation & compensation; sewage system and pollution incidence; accessibility to water resources and unfair allocation; water availability & base flow; water Quality Status; River flow levels; establishment of WUA's; signing of Bill Agent agreements by DWA; development of water storage. Further disputed mentioned by the South African respondents included the lack of benefits in return due to reserve that goes to Mozambique.*

In Mozambique, respondents mentioned only the allocation of water as the main type of dispute often raised in forum meetings. The SA respondents were split as to whether the RBO is able to resolve the disputes. At least two-thirds of these respondents indicated a moderate level of success in resolving disputes in SA, while at least 25% indicated no success by the RBO in addressing the disputes.

Both Mozambique L1 respondents were positive that the RBO is able to resolve disputes with moderate to significant success. The South African respondents detailed the challenges experienced by the RBO in dispute resolutions as including:

- Staff personnel are forever changing positions and this makes it difficult to track disputes/issues that need to be resolved;
- People change positions all the time & conflicts don't get resolved immediately;
- Due to movement of staff, sometimes the issues discussed are left unresolved as the next person is not0t aware of them;
- Staff resignations and documents are getting lost;

- Lack of autonomy in decision making; Absence of Water Allocation Plan and Water Resource Classification;
- Government and capacity;
- Lack of IWRM expertise;
- Irrigated agriculture (IIF) has not been involved in disputes with the CMA. Issues are discussed and mutually beneficial solutions found or ways to address the issues;
- There is no re-allocation of remaining water which is allocated to the second user.

5.4.3.5 REGULATORY INSTRUMENTS: ALLOCATION AND WATER USE LIMITS

According to GWP (2004) regulation within the context of IWRM relates to regulation of water allocation and use limits, including water quality, service provision and land use and water resource protection. Regulatory instruments will also include the monitoring instruments such an instrument to monitor water allocations and water use in a basin. Regulations are key in supporting implementation of water policies and legislative imperatives. Regulations effectively provide the 'operational guide' to implementation of policy and legislative imperatives (GWP, 2004).

Although not necessarily included in regulations (i.e. SA), the survey assessed the level of respondents knowledge of the water use authorisation procedure in the IRB in the 3 countries. Analysis of the result indicate that almost all (6) of the L1 respondents and 89% of the L2 respondents were aware of a water authorisation procedure in the basin, with 5 of these L1 respondents and 93% of these L2 respondents indicating that they were familiar with the water use authorisation requirement. When asked to expand on this water use procedure, respondents indicated that:

SOUTH AFRICA:

- All water users were requested to register and no new licences are made available to other users.
- We have a 1988 Water Permit but it is not valid anymore. The process is lengthy and requires a lot of documents. We have been applying for the new licence since 2000 and nothing is happening. Documents get lost in the process.
- Water Use Licence Application Procedure is detailed in Section 41 of the NWA.
    - *Step 1 – Pre-position and validation.* This is done when a licence application is received, and is used to check if everything needed to process the licence is available.
    - Step 2 – Initial assessment and grouping. This includes a quick assessment of the possible impacts and benefits of the proposed water use. In some cases a simple set of questions will be used to help make this assessment.
    - Step 3 – Regional Assessment. This step is done in the regional office where the application was made. The regional office gathers all the information required to

make a decision on whether to approve the application, and makes a recommendation to the national office.
    - Step 4 – Evaluation by the National Office. The application is then evaluated by specialist groups. These groups also make recommendations on the application. The application is then submitted to the Chief Director: Water Use for a decision.
    - Step 5 – Decision by the Chief Director: Water Use. After considering all the relevant information, the Chief Director: Water Use will make a decision on whether to approve the application.
    - Step 6 – Implementation. Once a decision has been made, the Regional Office will be informed, and they can start with implementing the licence. Applications are to be submitted to DWA, thereafter no feed-back or consultation with IB's.
- According to DWA, water service providers have been allocated with required registration of volume m^3 per year per stations.
- The WA of SA encourages that every citizen has the right to clean and fair allocation of water for domestic and agricultural needs. The right comes with responsibilities; hence it is important that ALL water users are registered as lawful water users. This helps DWA to review how water is used in a catchment and to reallocate water if necessary. The Catchment Assessment Report captures how water is being used, by whom, and its impact on the economy.
    - Communication and consultation. Make sure water is being used lawfully. All water use must be authorised
    - Registration and verification for existing users is an important part of the process.
    - Call for Licence Applications. Every water user and new user must apply for an allocation. Some may get General Authorisations. Licences must be issued as soon as is possible after the Final Allocation Schedule is published Valid for a maximum of 40 years but the period will be appropriate to the type of use and investments required. Can be reviewed after 5 years.

SWAZILAND:

- It is required by the act that a person irrigating more than 4ha or 30 heard of cattle require an abstraction permit, which is obtainable from the River Basin.
- Enforcing terms and conditions of water permits
- Issued by the DWA
- It is stated in the WA

MOZAMBIQUE:

Request for a Water License at RBO includes identification of enterprise:

- Request water License Form;
- Certificate of commercial register;
- Declaration of right of use land;

- Environmental Impact Assessment;
- Map of Localization Point of abstraction
- Preliminary project of the system of Abstraction

At a country level, all the Mozambique and Swaziland L2 respondents were aware of a water use authorisation procedure in the basin, with all of the respondents familiar with the authorisation requirements. Only 82% of the South African respondents were aware of a water use authorisations procedure in the basin, with 90% of these indicating that they were familiar with the procedure. The responses from L1 respondents in Mozambique and SA were similar to L2 above. Interestingly the L1 from Swaziland did not answer this question.

5.4.3.6 ECONOMIC INSTRUMENTS: USING VALUE AND PRICES FOR EFFICIENCY AND EQUITY

Economic tools involve the use of prices, subsidies, and other market based measures to provide incentives to all water users to use water carefully, efficiently and avoid pollution (GWP, 2004). All three countries have adopted the polluter-pays and user-pays principles. However, the manner in which to implement these principles, particularly the polluter-pays principle, remains unclear and complex. This change area is largely discussed under section 5.1.3 above.

5.4.3.7 INFORMATION MANAGEMENT AND EXCHANGE: IMPROVING KNOWLEDGE FOR BETTER WATER MANAGEMENT

Like monitoring systems, information management systems are required to support water decision making, evaluation and review of water resources for sustainable water resource development and utilisation (Manyatsi and Brown, 2009). Information management systems for data sharing, increase stakeholder access to information stored in public domain data banks and effectively complement more traditional methods of public information (GWP, 2004).

Respondents in this study were requested to indicate the source of information sharing, other than catchment meeting, available to stakeholder and to determine the effectiveness of these. A low percentage of respondents answered this question, with the majority of these being South African respondents. Both the Mozambique and South African L1 and L2 respondents indicated annual report, newsletter and websites as sources of information in the river basin. The Swaziland respondents did not provide details on information sources as the decentralisation process is in the formative stages and the focus in on setting up of the RBO and communication platforms related to this (i.e. forums and meetings)

5.4.3.8 SUMMARY OF KEY FINDINGS RELATED TO THE MANAGEMENT INSTRUMENTS IN THE INKOMATI CASE STUDY

Based on the secondary and primary data collected in this study, the key finding related to the IWRM management instruments in the IRB include:

- Environmental monitoring in the form of EIAs were not part of the Inkomati survey;
- The Inkomati survey did not determine whether IWRM Plans were in place for the basin;

- Water use monitoring is taking place in all 3 case study countries in the IRB, although the availability and quality of data across the sectors varies;
- Stakeholders in all 3 countries of the case study are aware of a water use authorisation process and were familiar with the process.

Water monitoring is conducted in the basin by all three of the case study countries. However, in SA, the concern was that water monitoring was mostly associated with lack of understanding of management instruments. It was further mentioned that, although water monitoring is conducted on monthly basis, water managers, stakeholders or RBO's need to understand what they are monitoring against.

In Mozambique and SA, there is a forum in place to deal with disputes in the IRB, with moderate success in addressing these disputes. However, in Swaziland there is no forum in to deal with disputes in the IRB

5.5 CONCLUSIONS

Implementing of IWRM and decentralisation of water governance has come a long way in the IRB. A significant step forward has been achieved with the IWRM enabling environment being largely in place in all three countries in the basin. This is a significant development as the policy and legislative environment is the most crucial to guide and regulate the sector in future. Currently, the financial enabling environment is the only weakness, with the mechanisms to ensure water management institution becoming self-sustaining still being developed or only partially implemented.

The findings of our study further show that decentralization of authority and power for decision-making has included RBOs in the SA and Mozambique portions of the IRB, but not all the authority and power for decision-making has been transferred to lower level organizations (e.g. WUAs). The central government is still playing a significant role in providing financial resources to sustain the lower level institutions and it was further reported that some of the decisions made by these institutions are been delayed by the central government. Hence, this affects performance and sustainability of the decentralisation process and if WMI do not strive for sustaining themselves in future, the decentralisation process will not succeed and become sustainable. However, Mozambique has started to demonstrate the first success in this respect.

The IWRM institutional framework and roles are also largely in place in the IRB. However, the change areas within these criteria demonstrate varied levels of success. Institutional structures, roles and responsibility have successfully been articulated in policy and legislation in the basin. Implementation of these policy and legislative IWRM imperatives however remains a challenge. Only some of the decentralised water institutions have been established and are functioning at various levels of success. Stakeholder participation does seem to be one of the successes of the institutional framework in the IRB. Greater attention will need to be paid to capacity building in future IWRM endeavours.

The IWRM instruments are perhaps the least developed change areas of the Inkomati case study. This is to be expected as management instruments are effectively the implementation tools for IWRM. With the implementation of IWRM and decentralisation of water management still relatively new in the Inkomati, one would expect that these management instruments will develop as the IWRM process progresses. However the current conflict resolution mechanisms should be noted, as should the initial regulatory instruments. Much work is still ahead however, particularly within these criteria for IWRM.

CHAPTER 6: SUMMARY, CONCLUSIONS AND IMPLICATIONS

6.1 MOTIVATION AND PURPOSE OF THE STUDY

For long time water resources have been managed in a centralized manner where delivery of the full range of WRM activities was provided by national institutions, usually national governments. This often resulted in poor services, infrastructures located in the wrong places and management systems that are not sustainable in the long term because of little or no participation of water users or private sectors in this process (Easter and Heame, 1993). Swatuk (2005) identified problems associated with the centralized management approach to include: inequality in access to water, limited financial and capacity at national and basin levels for river basin management, poor river basin infrastructure and service delivery, declining quality and quantity of the river basin natural resources, limited stakeholders involvement in the basin management, institutional fragmentation, uncoordinated and often conflicting sector policies, impacts of recurrent droughts/floods and increasing number of conflicts among stakeholders.

The Dublin Statement on Water and Sustainable Development crafting what is commonly referred to as the "Dublin Principles" emerged from the International Conference on Water and the Environment (ICWE) articulating sustainable water policies and an action program to be considered by the United Nation Conference on Environment and Development (UNCED) held at the end of 1992 (Rahaman and Varis, 2005). The Dublin statement, which advocates four key principles for WRM: "*participatory approach* to managing the *finite and vulnerable resource* as an *economic good* with a *central role for women"* have been recognized and accepted by international agencies and governments as a universal approach to WRM. Chapter 18 of Agenda 21 emanating out of the UNCED recommended that one of the action programme areas of the freshwater sector be *integrated water resources development and management* (UNCED, 1992). Furthermore the World Summit on Sustainable Development (WSSD) held in 2002 succeeded in placing IWRM at the top of the international agenda as one key requirement for achieving sustainable development, providing specific targets and guidelines for implementing IWRM worldwide (Rahaman and Varis, 2005). At the same UNCED the GWP adopted the IWRM as a process emphasizing that water should be managed in a basin-wide context, under the principles of good governance and public participation (GWP, 2000).

Since then many African countries (like countries elsewhere) introduced various reforms to implement key elements of IWRM and attempted to overhaul their water laws and related regulations and institutions to facilitate the move to decentralization of WRM and governance (Van der Zaag, 2005; GWP, 2000). For example, the SADC countries have adopted comprehensive institutional reforms in the water sector towards decentralization of water management (Magaia, 2009; Backeberg, 2005; Karar, 2003; Wester, 2003; Manzungu and Kujinga, 2002). However, the impact of these reforms on river basin decentralization process and its performance is still largely unknown. Very different stages of advancement have been

observed in various African river basins indicating the difficulty of implementing decentralization in practice. It therefore seems necessary to understand why some water agencies have succeeded more than others, what are the variables involved in such reform process, which variables have a positive or a negative impact on the implementation of decentralization processes in the African water sector, and which variables could be affected by policy interventions and how.

The purpose of this study is to contribute to filling this gap and attempt to address the above questions adapting to the African context an analytical framework developed and applied to similar situations elsewhere (Kemper et al., 2006). The analytical framework intends to capture the factors likely to be related to river basin management success and generate hypotheses that could be tested in actual settings where river basin management had been attempted. The study is hoped to enable water sector decision-makers identify and properly address hurdles hampering a transfer of water management actions to the lowest appropriate level within river basins. A number of social, economic, human health and environmental benefits are expected from carrying the study. Successful decentralization is expected to improve representation of all water users and therefore insures more equitable allocation. Second, more efficient use of water can be reached if local knowledge about water demand and supply is mobilized to design and implement allocation strategies. Water management at the lowest appropriated level also reduces transaction costs due to redundant or inappropriate institutional frameworks. Another important benefit of successful decentralization relates to improving disadvantaged communities and users access to sufficient water supply and reduces exposure to water-borne diseases and health hazards widely spread in Africa especially among the urban and rural poor. Moreover, environmental sustainability is one of the pillars of IWRM. Decentralized decision making processes facilitate better understanding of the local problems of water uses at the catchment level. Stakeholders' participation in the definition of environmental standards increases dramatically the probability that these standards will then be respected and complied with, again contributing to lower transaction costs associated with monitoring and enforcement functions as known common burdens of centralized management systems.

6.2 APPROACH AND METHODS OF THE STUDY

Studies of river basin management have focused mainly on surveys of efforts of different governments and agencies to implement IWRM at national level. Few studies particularly dealt with decentralization of WRM and governance (Dinar et al., 2005; Kemper et al., 2006). Most studies so far shed light on the direction of river basin decentralization, are mainly descriptive and do not incorporate many important political, institutional, hydrological, cultural and historical as well as socio-economic variables and the way by which these variables may influence decentralization outcomes.

The methodology chosen for conducting the intended analysis of decentralization of water management in Africa under this research project will employ quantitative analysis tools that

will take into account hydrological, socio-economic, cultural and historical conditions in each basin. The plan is to use and adapt to the African context the analytical framework of Kemper et al. (2006), Dinar et al. (2007), and Blomquist et al. (2008), who developed and implemented a comparative framework to explain river basin management decentralization reform processes and their performance. Their methodology permits both in depth case study analyses (Kemper et al., 2006; Blomquist et al., 2008) and quantitative estimates from a global set of river basins attempting decentralization (Dinar et al., 2007). The framework identifies and focuses primarily upon four sets of potentially observable variables (physical, financial, economic and equity indicators), and suggests hypotheses about the paths by which those variables are associated with the likelihood of successful or unsuccessful decentralization of river basin management.

It has originally been proposed to apply the above analytical framework in two phases. In the first phase a detailed application of the case study approach of Blomquist et al. (2008) be modified and applied to a sample of basin organizations across the SADC region, representing various physical, economic and political situations. One river basin in SA (Inkomati), one river basin in Mozambique (Ara Sul) and one river basin in Zimbabwe (Umzingwane) that underwent decentralization reforms have been proposed for implementing the case study component in the first phase of the study. These catchments, all situated in the SADC region, were chosen because they have all been exposed to a certain degree of institutional decentralization (establishment of CMAs, creation of basin authorities, WUAs, etc.). For trans-boundary catchments, only the main national component was to be studied, to avoid overlapping of analyzed issues. The results of this regional cross-country study will provide useful insights for policy makers who consider decentralization of river basins but have little or no experience, or those who aim at adjusting existing frameworks of decentralized river basins, that have not been well doing to achieve better performance.

While the case study analyses highlight the direction in decentralization of river basin management, they do not allow identification and systematic quantitative analysis of generic reasons and forces behind the decentralization process and performance. Accordingly a quantitative analysis applied to the decentralization of basins across Africa was planned to take place in the second phase of the study. The two phase approach was thought to enable careful modification of the set of variables used in the econometric study of Dinar et al. (2007) by adjusting the questionnaire used to carry that study to conditions prevailing in the Africa region.

This design and study plan was also chosen to provide a direct link and facilitate valuable complementarities between two research initiatives supported by a number of collaborating institutions over an overlapping time frame. The first was an initiative supported by the WRC, under the Institutional Governance and Reforms Program of its Water Resource Institutional Arrangements Thrust to carry sub-regional analysis on the progress and performance of experiences in implementing decentralization of water management in southern Africa in

collaboration with IWEGA and CEEPA. This was coupled with another parallel initiative supported by the WSPC of the University of California Riverside in collaboration with IWEGA and funding from the World Bank to carry similar investigation at continental level in Africa. Original plans and analytical approaches of the sub-regional analyses have been modified as implementation of study progressed for a number of reasons explained in subsequent sections.

6.3 A FRAMEWORK FOR REFORM PROCESS AND PERFORMANCE ANALYSIS: AN APPLICATION TO THREE SOUTHERN AFRICAN RIVER BASINS

This study showed that attempts to decentralize management of the Inkomati, Mzingwane and Limpopo river basins in SA, Zimbabwe and Mozambique, respectively have been supported by ratifications of water laws leading to creation of river basin level institutions (organizations and other mechanisms) to manage basin resources. Examples of local level organizations include the Inkomati CMA in SA, the Zimbabwe National Water Authority in the Mzingwane river basin and the Limpopo River Basin Management Unit in Mozambique. Establishment of systems for information sharing among stakeholders, commonly performed using basin meetings is one example of mechanisms which facilitate the management of river basin management.

None of the studied river basins can be considered fully decentralized and the decentralization processes varied among the three case study basins. The Inkomati in SA was found to be more decentralized compared to Mzingwane in Zimbabwe and Limpopo river in Mozambique basins where the process appears lagging behind. Variations in key institutional factors seem to be the reason behind these differences. The positive outcomes of the Inkomati river basin decentralization process are linked to the type of devolution (mutually desired process) followed, which resulted in larger involvement of local stakeholders, compared to the weak involvement of river basin stakeholders in the Mzingwane and Limpopo river basins due to the top down devolution approach followed.

Similar to the decentralization process, results of the evaluation of performance of the decentralization initiatives in the three river basins are mixed. Although RBOs in the three countries do not have financial management autonomy, the Inkomati shows the best performance, followed by Mzingwane, which seems to outperform the Limpopo river basin. Participation of stakeholders in the management of river basin resources has been a crucial factor determining these differences. It is important to note that the establishment of participatory mechanisms in decision-making involves shifting power from central government to the basin level. While governments (e.g. policies and laws) of the studied river basins have shown high willingness and commitment to decentralized river basin management, concentration of power seems to be the key factor that negatively impacted the performance of the studied river basins. In Zimbabwean for instance, the government continued to concentrate management powers in ZINWA in Mzingwane, and similarly, powers in managing the Limpopo basin remain concentrated in the RBOs (UGBL, HCEP, BLIS), which prevented participation of local stakeholders in river basin management and consequently reduced decentralization to de-

concentration in these two river basins. It is also important to highlight that the process of decentralization reforms requires years, even decades and therefore central governments should be prepared to extend their commitment to decentralization reforms for many years to come in order to achieve successful decentralization of water resources management.

A number of shortcomings however, limit the robustness of the results of this study. First, the analysis is based on only three data points representing the composite responses of interviewed key informants in the three case study river basins. This did not allow implementation of the proposed analytical framework and empirical model, which requires estimation of a much larger number of parameters. Such analysis will be achieved by a continental study to follow that will survey sufficient number of river basins in SSA. Second, testing of the original questionnaire designed for implementing the proposed institutional economics analytical framework in this study suggested few necessary modifications to be made before adopted in conducting the bigger continental study. Removal of the section in the original questionnaire information for which is more appropriately compiled from secondary sources is one key modification recommended by this study. Implementation of the original questionnaire in this study revealed that information related to financial status of the river basin is difficult to capture and hence questions about financial aspects have been modified in order to improve response rates and data quality.

Phase 2 of this project will undertake quantitative analysis of data to be collected in all available SSA river basins using the modified questionnaire. The second phase continental survey will be conducted by a South African consultant while the econometric analyses of the collected data will be led by the WSPC based at University of California, Riverside in collaboration with the IWEGA based at Eduardo Mondlane University, Mozambique. The WRC Project Reference Group (WRC-RG) however, considered the above analysis of the process and performance of decentralization of water management in the three southern Africa river basins not sufficient for the objectives of Phase one of this project. The WRC-RG also thought that the intended continental survey and analysis will be of high relevance and policy value for higher levels of management at river basin level but will not provide enough information for assessing progress and performance of decentralization reforms and experiences at regional and national levels in the southern Africa context. It has accordingly been decided to extend the regional analysis of Phase one of the project to address its current shortcomings.

The main objective of the expanded study in Phase one of the project is to conduct further analysis investigating progress and performance of decentralization of water management reforms in the region applying an adapted version of the above tested institutional economics analytical approach, methodology and questionnaire suited for the SADC regional and national contexts and experiences in implementing IWRM. The plan has become that the remainder of Phase I investigation rerun the survey with the adapted questionnaire in the three countries sharing the Inkomati river basin, namely SA, Swaziland and Mozambique. The IRB was recommended as the case study for completing the expanded phase analysis for the following distinct advantages:

d. It has international, national and local dimensions of river basin management decentralization
e. Institutions have been established within the various states sharing the river basin
f. There is a broad policy alignment in terms of intent toward implementing IWRM

6.4 REVIEW OF INSTITUTIONAL DEVELOPMENT AND CHALLENGES FACING DECENTRALIZATION OF WATER MANAGEMENT WITHIN THE IRB

The water resources of the IRB are shared between three basin states each of them has strategic social and economic development drivers that depend on the availability and equitable use of the water resources of the river. Mozambique for example is faced with continued growth of the Maputo region and the subsequent increase in demand for water for irrigation, hydropower generation and water supply and sanitation. SA also relies heavily on the IRB to meet its large scale commercial agriculture, forestry, industry and hydropower generation, as well as mining activities. Similarly, Swaziland relies on the same water resources and its strategic drivers include tourism, industry, forestry, and agriculture to meet its social and economic development needs. However, it must also be noted that any water resource development planned and implemented by SA and Swaziland have a direct impact on the amount of water flowing into Mozambique.

Meeting the above strategic development needs clearly puts a lot of stress on the Inkomati water resources and requires that the three states harness water flows wisely to cater for these demands. To this effect, various bilateral and trilateral agreements have been put in place to facilitate the sharing of the water resources of the IRB. Some of the agreements have resulted in trans-boundary bilateral and tripartite committees and RBOs. Examples of these trans-boundary structures (committees and organisations) include water (basin) infrastructure authorities such as the Komati Basin Water Authority established under a treaty between SA and Swaziland to develop, finance and/or operate joint WRI between the two countries. Multi-lateral basin committees such as the tripartite technical committee (TPTC) have also been established to advise the parties on a range of trans-boundary water management issues and priorities, including the development of a basin agreement/plan concerning the allocation of water, trans-boundary objectives and institutions to be established to foster cooperation in the basin.

In addition to the trans-boundary structures, each of the three countries also has specific water laws that guide water governance and management at a country level. These laws follow an IWRM approach and are aligned to the SADC regional water policy, the SADC Protocol on the management of trans-boundary water resources and other regional and international laws developed to coordinate systematic development and management of water resources. Within each country these water laws guide the decentralisation process and give effect to the establishment of institutions to facilitate IWRM. While progress has been made to establish these WMIs, preliminary research indicates that this process continues to face several challenges, including:

- Political support and appetite for change.
- Financial constraints, in particular to support and sustain the decentralisation process.
- Planning, coordination and monitoring, including information management and reporting on the state of the water resources.
- Institutional arrangements and duplication of roles between the new institutions and the departments that have been responsible for the implementation of WRM in the basin.
- Human resource capacity, including lack of skills to guide the decentralisation process while at the same time facing the need to implement integrated WRM.
- Trans-boundary basin management, especially conflicting priorities among states and the need to meet strategic social and economic developments needs in the three countries.
- Stakeholder engagement and communication, in particular the need for extensive engagement and empowerment of water users, a process that requires significant financial resources to accomplish.

The most important challenge is the slow pace of the decentralisation process in the three basin states despite clearly defined water laws. There is certainly a need for more research work to verify and confirm the above identified preliminary challenges and propose options to improve the situation. Moreover, given the national drivers in each country and the trans-boundary arrangements summarised above, a number of questions need to be answered that relate to the role of decentralised WMIs in the basin to facilitate IWRM.

6.5 REVIEW OF METHODS AND INDICATORS AND DEVELOPMENT OF A METHODOLOGY AND PROTOCOL FOR MONITORING PERFORMANCE OF DECENTRALIZING RIVER BASIN MANAGEMENT

Our review of the literature on approaches and indicators shows that a lot of work has been done to determine progress and answer important performance questions at river basin level. Booth et al. (2002) suggests a process to choose indicators and argues that understanding the purpose of the chosen indicator is critical and should inform tracking of performance associated with the indicator. Sieker et al. (2006) suggests that any indicator may be chosen to generate the information needed for improved decision making in line with set objectives in the basin. Indicators must be defined as part of a coherent strategic process that takes into consideration the monitoring and evaluation requirements necessary for tracking progress and must be viewed as building blocks that provide the baseline needed to better plan for IWRM.

Indicators identified by Hooper and Ward (2006) are divided into seven benchmarks: a societal decision system indicating the level of coordination between sectors to achieve societal goals through consensus. Four indicators fall within this societal benchmark. An information management system makes the fifth indicator that supplies knowledge to enable effective decision system. A water use efficiency indicator represents the sixth benchmark that provides evidence relating to the effectiveness of the social decision system. Finally, the social welfare benchmark captures the well-being of basin communities following implementation of above

indicators. Dinar et al. (2005) uses a statistical approach to assess performance of decentralised RBOs. Variables that depict the characteristics of the decentralisation process and those that capture incremental progress are used to estimate and compare the before and after status of decentralisation. Indicators described by INBO/ ANBO (GWP and INBO, 2009) and Cap-Net are aimed at assessing the performance of RBOs that have a trans-boundary rather than in-country focus.

The GWP-SA Report on the progress of IWRM implementation processes uses a set of indicators developed based on the GWP Toolkit. These indicators have been used in several countries in the SADC and are designed to provide insights into the enabling framework and management instruments applicable at river basin level. Although the indicators were used to assess IWRM at a regional scale, similar indicators are likely to be effective when applied to assess performance of RBOs that operate at a country level.

A methodology framed in line with indicators developed by GWP has been developed for testing and use for this study with some elements adapted from the Cap-Net approach, such as progress indicators and units defining actual performance on implementation of specific IWRM functions. Two reasons for choosing the approach and indicators proposed above are: (1) GWP and Cap-Net indicators are based on aspects of water governance and IWRM, and (2) perhaps the most important reason is that, these indicators have already been tested in a number of RBOs and in the case of the GWP indicators at regional scale in the SADC. Since the countries targeted for conducting the performance assessment intended here form part of the SADC, it makes sense to explore further the extent to which progress has been made in these countries toward implementing the decentralisation process applying an approach similar to the regional one with minor adaptations to suit existing case study RBOs.

The adapted INBO and Cap-net indicators are categorised according to two aspects: (1) enabling framework that define rules created by legislation and policy, and (2) management instruments that define practises necessary for successful river basin governance decentralisation. The selected indicators are considered easy to interpret, pragmatic enough, with elements of concreteness to facilitate river basin planning and enable managers develop measures that are easy to report on, and are likely to be reproducible as a tool to allow for continuous assessment, monitoring and reporting by the relevant RBO. Since both INBO and Cap-Net performance indicators have a focus on trans-boundary RBOs, not all indicators proposed will be applicable in the context of our case study in-country RBOs. Therefore, a selection of specific indicators is necessary to ensure that RBOs are assessed based on what is relevant to their specific situation.

The selected indicators are divided into 4 main themes each with one or more indicators capturing elements that describe the enabling framework, the management instruments, and the operational instruments. These can be seen at different scales with the enabling framework being more national in nature, the management instruments touching national and regional scales, whilst the operational instruments encompassing both regional and local levels. The four main

themes and their sub-indicators proposed are not exhaustive, and the focus of the assessment is on elements that are critical for the success of the decentralisation process and effective WRM.

The enabling framework constitutes the first category of indicators that aim at assessing the policy, legal and institutional environment within which RBOs operate to determine the extent to which it is conducive to achieving IWRM objectives. The second category of indicators captures performance assessment elements under management instruments, which include water use efficiency, infrastructure management, stakeholders' engagement and financing. The third category covers operational instruments with performance elements ranging from planning and monitoring, functional and institutional coordination, and legislation to enforcement and compliance. To collect information needed for construction of the proposed indicators guiding examples of types of questions to be included under each were provided.

6.6 IMPLEMENTATION EXPERIENCES AND PERFORMANCE OF WATER GOVERNANCE DECENTRALIZATION IN THE THREE COUNTRIES OF THE INKOMATI RIVER BASIN

Implementing of IWRM and decentralisation of water governance has come a long way in the IRB. A significant step forward has been achieved with the IWRM enabling environment being largely in place in all three countries in the basin. This is a significant development as the policy and legislative environment is the most crucial to guide and regulate the sector in future. Currently, the financial enabling environment is the only weakness, with the mechanisms to ensure water management institutions becoming self-sustaining still being developed or only partially implemented.

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The IWRM institutional framework and roles are also largely in place in the IRB. However, the change areas within these criteria demonstrate varied levels of success. Institutional structures, roles and responsibility have successfully been articulated in policy and legislation in the basin. Implementation of these policy and legislative IWRM imperatives however remains a challenge. Only some of the decentralised water institutions have been established and are functioning at various levels of success. Stakeholder participation does seem to be one of the successes of the

institutional framework in the IRB. Greater attention will need to be paid to capacity building in future IWRM endeavours.

The IWRM management instruments are perhaps the least developed change areas of the IRB case study. This is to be expected as management instruments are effectively the implementation tools for IWRM. With the implementation of IWRM and decentralisation of water management still relatively new in the IRB, one would expect that these management instruments will develop as the IWRM process progresses. However the current conflict resolution mechanisms should be noted, as should the initial regulatory instruments. Much work is still ahead however, particularly within these criteria for IWRM.

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ANNEX A: Integrated Water Resource Management Institutional Questionnaire

Basin Demographic

1.1 Basin name		**1.11 Organisation Category (tick one)**	
1.2 CMA name		Departments and Spheres of Government	
1.3 Name of stakeholder		Water Resource Management Institutions	
1.4 Contact person		Conflict and Dispute Resolution Bodies (e.g. Water	
1.5 Address		Commercial Users (energy, forestry, agriculture.)	
1.6 Country		Emerging Users	
1.7 Telephone		Environmental Interest Groups (conservation areas,	
1.8 Fax		Developmental Interest Groups	
1.9 Email		Other	
1.10 Website			

Basin Characteristics

2.1 Countries that share the basin			
2.2 Basin area (km^2)		**2.4 Water Resource availability from all sources (dry season) (m^3)**	
2.3 Basin surface water (length in km)		**2.5 Water Resource availability from all source (wet season) (m^3)**	
2.6 Average share by type of available water	**Type of water source**	**2.6.1 Share in basin (volume in m^3)**	**2.6.2 Share in basin (percentage)**
	Ground water		
	Surface water		
	Both		
	Other (specify)		
2.7 Number and capacity of infrastructure in the basin	**Type**	**2.7.1 Number**	**2.7.2 Cumulative capacity (volume in m^3)**
	Canals		
	Reservoirs		
	Dams		
	Water treatment plants		
	Pump stations		
2.8 Urban Population in basin (thousands)			
2.9 Rural population in basin (thousands)			
2.10 Main water user types by volume and share of water resource	**Type**	**2.10.1 Volume (m^3)**	**2.10.2 % share**
	Irrigation / agriculture		
	Industry		
	Hydropower		

	Domestic		
	Environmental (Reserve, protected areas, nature reserves, etc.)		
	Other (specify)		
2.11 Area and percentage land use per water user group	**Water user group**	**2.11.1 Square km^2**	**2.11.2 Percentage of basin area**
	Commercial agriculture		
	Emerging farmers		
	Forestry		
	Urban areas		
	Rural areas		
	Conservation		
	Other (specify)		

Characteristics of the decentralisation process (policy)

3.1 Are the following policies in place?	**Policy**	**Yes**	**No**	**3.1.1 Please add comments if any.**
	Water allocation			
	Flood / drought control			
	Pollution control			
	Water monitoring			
	Other			
3.2 In your opinion are the policies in line with the principles of IWRM?		**Yes**	**No**	**If no, please add comments where possible.**
3.3 If yes, please indicate which principles are catered for?	**Principle**	**Please add comments, with reference to specific policy, where possible.**		
	Water as economic good			
	Stakeholder participation			
	Role of women in water			
	Water as finite and vulnerable resource			
3.4 Who was instrumental in crafting the policies?		**Yes**	**No**	**Comment, if any**
Politicians				
Government officials				
Traditional leaders				
Basin stakeholders				
Public				
Other				
3.5 In your opinion are the present		**Yes**	**No**	**Please provide details**

policies contributing to the decentralisation of water resource management?						
3.6 If yes to 3.5 above, please indicate the degree to which the decentralisation of water resource management objective has been met in policy – please tick the relevant percentage.	***Not at all***	***25% attained***	***50% attained***	***75% attained***	***100% attained***	**Please provide details**
Flood / drought control						
WR planning						
Pollution control						
Water monitoring						
Stakeholder participation						
Water allocation						
Other (please specify						
3.7 Period of decentralisation	**Years/months**					

3.8 Do you think the CMA is empowered to perform its functions?	**Yes**	**No**	**3.9 If yes to 3.8, how are these powers/ functions /duties implemented?**	
			MoU	
			Implementation agreement	
			Service Level Agreement	
			Other	

Institutional decentralisation (setting up institutions)

4.1 Are institutional arrangements in place to support IWRM?	**Yes**	**No**	**Please add comments where possible.**
4.2 Is there legislation in place that requires the establishment of a CMA or equivalent?	**Yes**	**No**	**Please add comments where possible.**
4.3 Does the legislation mandate the responsibility of the CMA or equivalents?	**Yes**	**No**	**Please add comments where possible.**

4.4 What is the mandate of the CMA or equivalent in terms of the legislation? (tick mandated responsibilities in legislation)	
Flood / drought control	
WR planning	
Pollution control	
Water monitoring	
Stakeholder participation	
Water allocation	
None of the above	
4.5 Does the legislation provide Minister with powers to mandate responsibility of the CMA or equivalent? (tick which responsibilities the Minister can mandate)	
Flood / drought control	
WR planning	
Pollution control	

Water monitoring							
Stakeholder participation							
Water allocation							
None of the above							
4.6 How was the CMA or equivalent established?	**Bottom-up**	**Top-down**	**Both**	**Please explain process**			
4.7 Who created the CMA or equivalent?	**Gov.**	**Private sector**	**Civil society**	**Local gov.**	**NGOs**	**Other (specify)**	**All**
4.8 Bearing in mind the CMA objectives mentioned in 4.4 and 4.5; in your opinion what is the current rate of success?	**Not Applicable**	**0% success**	**25% success**	**50% success**	**75% success**	**100% success**	
Flood / drought control							
Water scarcity							
Pollution control							
WR Planning							
Water Allocation							
Stakeholder participation							
4.9 Have local stakeholder based water management institutions been created?	**Yes**	**No**	**If yes, please list the types of institutions established in the space below.**				
4.10 In your opinion, do these local institutions have sufficient of the following capacitated to implement IWRM?	**Yes**	**No**	**Please provide more details**				
Human resource capacity							
Financial capacity							
4.11 In your opinion, what were the estimated costs associated with the following activities of the decentralisation process?			**Estimated cost (in local currency)**				
To dismantle old institutions							
To create new local institutions							
To create a CMA							
Other							

CMA management (operation)

5.1 Does the CMA collect user charges/ revenue?	**Yes**	**No**	**Not sure**	
5.2 How often is the revenue collected?	**Monthly**	**Quarterly**	**Half yearly**	**Annually**
5.3 If yes to the question above, what is the value of	**Sector**	**Total revenue amount (in local currency)**		
	Commercial			

revenue by sector?	agriculture						
	Emerging farmers						
	Forestry						
	Industry						
	Mining						
	Domestic use						
	Other						
5.4 Percentage of revenue staying in the basin	**Sector**	**Not Applicable**	**0%**	**25%**	**50%**	**75%**	**100%**
	Commercial agriculture						
	Emerging farmers						
	Forestry						
	Industry						
	Mining						
	Domestic use						
	Other						
5.5 Indicate the value and percentage payment of water tariff for each user type.	**Sector[10]**	**Water tariff (in local currency per m^3)**		**Percentage who pay**		**Please explain how you determined this percentage**	
	Commercial agriculture						
	Emerging farmers						
	Forestry						
	Industry						
	Mining						
	Domestic use						
	Other						
5.6 What is the destination of water tariffs?		**National Gov.**	**Provincial/ Regional Gov.**	**Local Gov.**	**CMA/ River basin org**	**WUA**	**Other**
5.7 To what extent are sector departments involved in the operations of the CMA?	**Gov. Department**	**Not Applicable**	**0%**	**25%**	**50%**	**75%**	**100%**
	Environment						
	Mining & Energy						
	Treasury						
	Local Government						
	International Affairs						
	Other						

[10] Please indicate tariff and percentage of those who pay by writing on the spaces provided in the table above.

5.8 Extent of private sector involvement in the basin?	Activity	Not Applicable	0%	25%	50%	75%	100%
	Water treatment						
	Water supply						
	Maintenance						
	Reservoir construction						
	Water quality monitoring						
	Other (please specify						

5.9 Is there a water use authorisation (permit, registration, licensing) procedure in the basin?	Yes	No	Not sure	5.10 If yes, are you familiar with the water use authorisation requirements?	Yes	No

5.11 Please describe the water use authorisation procedure	

5.12 Does the CMA monitor water use in the basin?	Yes	No	Not sure	5.13 If yes, how often do you receive water use monitoring reports?	Month	Annual

5.14 Does the CMA monitor water quality in the basin?	Yes	No	Not sure	5.15 If yes, which determents are monitored?	
				Dissolved oxygen	
				pH	
				Temperature	
				Conductivity	
				Suspended solids	
				Other 1	
				Other 2	

5.16 Does the river basin organisation have the necessary authority / independence in managing water resources?	Yes	No	5.17 Are some of the decisions made by the CMA delayed by government?	Yes	No

5.18 If yes to 5.17, how do you rate the impact of these delays on service delivery?	None	Moderate	Severe

Financing of the CMA

6.1 Annual budget (million local currency per year)			
6.2 Amount and percentage of budget provided by external agencies?	**Name of agency**	**Amount (local currency)**	**% of budget**
6.3 What is the amount (local currency) and percentage derived from basin stakeholders?	**Amount (local currency)**		**% of budget**
6.4 What amount and percentage of the budget is derived from other sources?	**Source**	**Amount (local currency)**	**% of budget**
6.5 % of budget used for investment in the basin			
6.6 % of budget used for O&M			
6.7 % of budget used for other activities			
6.8 Please indicate what the other activities are (as referred to in 6.7 above)?	**Activity**		**% of budget**

Stakeholder engagement and dispute resolution

7.1 How often does the river basin organisation (CMA or equivalent) call for a meeting? Please indicate by ticking one of the following options	**Never**	**When need arise**	**Twice a year**	**Quarterly**	**Monthly**	**Other**
7.2 When meetings are held, what is the level e of stakeholder involvement?	**0%** no stakeholder attend meetings		**50%** half stakeholder all the time or all stakeholder half the time		**100%** all stakeholder attend all meetings	
7.3 What types of issues are frequently discussed		**Yes**	**No**	**Provide details**		
	Politics and non-					

during these meetings?	water issues			
	Some water issues			
	Purely important water issues			
	Other			

7.4 What is the percentage of time allocated to each of the following issues at the meetings?	**Item**	**Percentage amount of time (%)**
	Politics and non-water issues	
	Some water issues	
	Purely important water issues	
	Other	
7.5 What are the other forms of information sharing available to stakeholders in the basin, and in your opinion what is their rate of effectiveness?	**Item**	**Percentage amount of time (%)**
	Annual reports	
	Newsletters	
	Websites	
	Other	
7.6 Are there forums to hear disputes (between water user and CMA or between water users themselves)) coordinated by the CMA?	**Yes**	**No**

7.7 If yes to 7.6 above, how often do the forums meet?	**Never**	**When need arise**	**Twice a year**	**Quarterly**	**Monthly**	**Other (specify)**

7.8 What are the main types of disputes/ issues that are normally raised?				
7.9 How often do the dispute/issues arise?	**Never**	**Rarely**	**Often**	**Always**
7.10 Is the river basin organisation (CMA or equivalent) able to resolve the disputes?	**Yes**	**No**		
7.11 If yes to 7.10 above, what ifs the rate of success in resolving the disputes?	**No success**	**Moderate success**		**Significant success**
7.12 What are the challenges experienced by the CMA in resolving the disputes?				

Performance of the decentralisation process

8.1 Please indicate the status *before* and *after* the establishment of the CMA or equivalent (for each water resource problem captured in the table below) by inserting one of the following choices	**Water resource problems at river basin level**	**Before**				**After**			
		No response	**No problem**	**Some problem**	**Severe problems**	**No response**	**No problem**	**Some problem**	**Severe problems**
	Water scarcity								
	Floods and droughts								
	Environment problems								
	Land degradation (erosion, salinity, etc.)								
	Water conflicts								
	Water allocation disputes								
	Water Storage shortage								
	Water quality problems								
	River ecology issues								
	Other								
8.2 Responsibilities for decision making before and after the creation of the CMA. 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 CMA using the following choices of share (in %) in decision making	**Responsibility for:**	**Before the creation of the CMA**				**After the creation of the CMA**			
		% at local gov. level	% at Basin level	% at state/ provincial gov. level	% at national gov. level	% at local gov. level	% 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)								
	Water Administration								
	Infrastructure								

	Financing								
	Water quality enforcement								

8.3 Water Resource Management Instruments: Compare the situation before and after the existence of the CMA:	**Water Resource Management Instruments**	**Before CMA**		**After CMA**	
	Existence of water right types (e.g. concessions, permanent rights, short-term rights qualitative or quantitative)	None		None	
		Permanent Rights		Permanent Rights	
		Long-Term Use Concession (more than 10 years)		Long-Term Use Concession (more than 10 years)	
		Short-Term Use Concession (less than 10 years)		Short-Term Use Concession (less than 10 years)	
		Permanent Transferable		Permanent Transferable	
		Permanent Non-Transferable		Permanent Non-Transferable	
	Who is responsible for awarding water rights	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for water allocation?	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for modeling and	N/A		N/A	
		National		National	

	forecasting water availability?	Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for monitoring and enforcement of water quality?	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for collecting tariffs?	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
8.4 Describe the reduction in loss of production and productivity due to water scarcity or flooding before and after the decentralization process?					
8.5 Quantify and describe disputes regarding water allocation or water quality before and after the creation of the River Basin Organization					

8.6 In your opinion, are there some characteristics about this river basin that make it different from other basins in the country?	**Yes**	**No**
8.7 If yes in question 8.6, what are these characteristics and can you	**Strengths:**	**Weaknesses:**

please mention the strengths and weaknesses of these characteristics?		
8.8 Any comments or clarifications including annexed material you think may be of value?		

Participation of Women and Equity

9.1. Please indicate the status of participation of women in decision making *before* and *after* the establishment of the CMA or equivalent	**Before**				**After**			
	Not applicable	**No participation**	**Some participation**	**Major participation**	**Not applicable**	**No participation**	**Some participation**	**Major participation**

9.2 Describe how women currently participate in water decision-making in the basin?		
9.3. Are there specific performance criteria for the CMA or equivalent to involve women in water decision making in the basin?	**Yes**	**No**
9.4 If yes in question 9.3, what are these performance criteria?		
9.5 Are there specific activities in the basin which focus on women?	**Yes**	**No**
9.6 If yes in question 9.5, what are these activities?		
9.7 Are there specific activities in the basin which focus on equity (other than women equity)?	**Yes**	**No**
9.8 If yes in question 9.7, what are these activities?		

9.9 Do these equity activities focus on? (please tick option)	
Flood / drought control	
WR planning	
Pollution control	
Water monitoring	
Stakeholder participation	
Water allocation	
None of the above	
9.10If any options selected in 9.9, please could you provide further details?	

ANNEX B: Integrated Water Management Resource non-Institutional Questionnaire

Basin Demographic

1.2 Basin name		**1.11 Organisation Category (tick one)**	
1.2 CMA name		Departments and Spheres of Government	
1.3 Name of stakeholder		Water Resource Management Institutions (CMA,WUA, WB)	
1.4 Contact person		Conflict and Dispute Resolution Bodies (e.g. Water Tribunal)	
1.5 Address		Commercial Users (energy, forestry, agriculture)	
1.6 Country		Emerging Users	
1.7 Telephone		Environmental Interest Groups (conservation areas, consultants, activists)	
1.8 Fax		Developmental Interest Groups	
1.9 Email		Other	
1.10 Website			

Basin Characteristics (N/A)

Characteristics of the decentralisation process (policy)

3.1 Do you know whether the following policies are in place in the basin?	**Policy**	**Yes**	**No**	**2.1.1 Please add comments if any.**
	Water allocation			
	Flood / drought control			
	Pollution control			
	Water monitoring			
	Other			
3.2 In your opinion are the policies in line with the principles of IWRM?		**Yes**	**No**	**If no, please add comments where possible.**
3.3 If yes, please indicate which principles are catered for?	**Principle**	**Please add comments, with reference to specific policy, where possible.**		
	Water as			
	Stakeholder			
	Role of			
	Water as finite			
3.4 Who was instrumental in crafting the policies?		**Yes**	**No**	**Comment, if any**
Politicians				
Government officials				
Traditional leaders				
Basin stakeholders				
Public				
Other				
3.5 In your opinion are the present policies contributing to the decentralisation of water resource		**Yes**	**No**	**Please provide details**

management?				
3.6 Do you think the CMA is empowered to perform its functions?	**Yes**	**No**	**3.7 If yes to 3.6, how is the CMA performing their functions?**	
			Not at all	
			Few functions	
			Some functions	
			All functions	

Institutional decentralisation (setting up institutions)

4.1 In your opinion are institutional arrangements in place to support IWRM?	**Yes**	**No**	**Please add comments where possible.**

4.2 What do you think is the mandate of the CMA or equivalent in terms of the legislation? (tick mandated responsibilities in legislation)	
Flood / drought control	
WR planning	
Pollution control	
Water monitoring	
Stakeholder participation	
Water allocation	
None of the above	

4.3 How was the CMA or equivalent established?	**Bottom-up**	**Top-down**	**Both**	**Please explain process**

4.4 Who created the CMA or equivalent?	**Gov**	**Private sector**	**Civil society**	**Local gov**	**NGOs**	**Other (specify)**	**All**

4.5 Bearing in mind the CMA objectives mentioned in 4.4; in your opinion what is the current rate of success?	**Not Applicable**	**0% success**	**25% success**	**50% success**	**75% success**	**100% success**
Flood / drought control						
Water scarcity						
Pollution control						
WR Planning						
Water Allocation						
Stakeholder participation						

4.6 Have local stakeholder based water management institutions been created?	**Yes**	**No**	**If yes, please list the types of institutions established in the space below.**

4.7 In your opinion, do these local institutions have sufficient of the following capacitated to implement IWRM?	**Yes**	**No**	**Please provide more details**
Human resource capacity			
Financial capacity			

4.8 In your opinion, what were the estimated costs associated with the following activities of the decentralisation process?	**Estimated cost (in local currency)**
To dismantle old institutions	
To create new local institutions	
To create a CMA	

Other	

CMA management (operation)

5.1 Does the CMA collect user charges/ revenue?	**Yes**	**No**		**Not sure**			
5.2 How often is the revenue collected?	**Monthly**	**Quarterly**		**Half yearly**	**Annually**		
5.3 In your opinion, what is the destination of water tariffs?		**National Government**	**Provincial/ Regional Government**	**Local Government**	**CMA/ River basin org**	**WUA**	**Other**
5.4 In your opinion, to what extent are sector departments involved in the operations of the CMA?	**Government Department**	**Not Applicable**	**0%**	**25%**	**50%**	**75%**	**100%**
	Environment						
	Mining &						
	Treasury						
	Local						
	International						
	Other						
5.5 In your opinion, what is the extent of private sector involvement in the basin?[11]	**Activity**	**Not Applicable**	**0%**	**25%**	**50%**	**75%**	**100%**
	Water						
	Water supply						
	Maintenance						
	Reservoir						
	Water quality						
	Other (please						

5.6 Are you aware of a water use authorisation (permit, registration, licensing) procedure in the basin?	**Yes**	**No**	**Not sure**	**5.7 If yes, are you familiar with the water use authorisation requirements?**	**Yes**	**No**
5.8 Please describe the water use authorisation procedure						

5.9 Do you know whether the CMA monitors water use in the basin?	**Yes**	**No**	**Not sure**

[11] Please tick the correct percentage.

5.10 Do you know whether the CMA monitors water quality in the basin?	**Yes**	**No**	**Not sure**			
5.11 In your opinion, does the river basin organisation have the necessary authority / independence in managing water resources?	**Yes**	**No**	**5.12 In your opinion, are some of the decisions made by the CMA delayed by government?**	**Yes**	**No**	
5.13 If yes to 5.12, how do you rate the impact of these delays on service delivery?	**None**	**Moderate**	**Severe**			

CMA Financing (N/A)

Stakeholder engagement and dispute resolution

7.1 Do you know how often the river basin organisation (CMA or equivalent) call for a meeting? Please indicate by ticking one of the following options	**Never**	**When need arise**	**Twice a year**	**Quarterly**	**Monthly**	**Other**
7.2 Do you attend these meetings?	**Yes**		**No**			
7.3. If yes to 7.2, what is the level e of stakeholder involvement?	**0%** no stakeholder attend meetings		**50%** half stakeholder all the time or all stakeholder half the time		**100%** all stakeholder attend all meetings	
7.4 If yes to 7.3, what types of issues are frequently discussed during these meetings?		**Yes**	**No**	**Provide details**		
	Politics and non-water issues					
	Some water issues					
	Purely important water issues					
	Other					
7.5 What are the other forms of information sharing available to stakeholders in the basin, and in your opinion what is their rate of effectiveness?	**Item**	**Percentage amount of time (%)**				
	Annual reports					
	Newsletters					
	Websites					
	Other					
7.6 Are there forums to	**Yes**	**No**				

hear disputes (between water user and CMA or between water users themselves)) coordinated by the CMA?						
7.7 If yes to 7.6 above, how often do the forums meet?	**Never**	**When need arise**	**Twice a year**	**Quarterly**	**Monthly**	**Other (specify)**
7.8 What are the main types of disputes/ issues that are normally raised?						
7.9 In your opinion, is the river basin organisation (CMA or equivalent) able to resolve the disputes?	**Yes**	**No**				
7.10 If yes to 7.9 above, what would you rate as the level of success in resolving the disputes?	**No success**	**Moderate success**			**Significant success**	
7.11 Involving the disputes?						

Performance of the decentralisation process

8.1. In your opinion, what was the status *before* and *after* the establishment of the CMA or equivalent for each water resource problems (select an option for each of the problems)	**Water resource problems at river basin level**	**Before**				**After**			
		No resp	**No prob**	**Some prob**	**Severe prob**	**No resp**	**No prob**	**Some prob**	**Severe prob**
	Water scarcity								
	Floods and droughts								
	Environment problems								
	Land degradation (erosion, salinity, etc.)								
	Water conflicts								
	Water allocation disputes								
	Water Storage shortage								
	Water quality								
	River ecology								
	Other								

8.2 Water Resource Management Instruments: Compare the situation before and after the existence of the CMA:	Water Resource Management Instruments	Before CMA		After CMA	
	Existence of water right types (e.g. concessions, permanent rights, short-term rights qualitative or quantitative)	None		None	
		Permanent Rights		Permanent Rights	
		Long-Term Use Concession (more than 10 years)		Long-Term Use Concession (more than 10 years)	
		Short-Term Use Concession (less than 10 years)		Short-Term Use Concession (less than 10 years)	
		Permanent Transferable		Permanent /transferable	
		Permanent Non-Transferable		Permanent Non-Transferable	
	Who is responsible for awarding water rights	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for water allocation?	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for modeling and forecasting water availability?	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for monitoring and enforcement of water quality?	N/A		N/A	
		National		National	
		Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
	Who is responsible for	N/A		N/A	
		National		National	

	collecting tariffs?	Provincial		Provincial	
		Local Government		Local Government	
		Regional Organization		Regional Organization	
		National Agency		National Agency	
		River Basin Organization/ CMA		River Basin Organization/ CMA	
8.3 Describe the reduction in loss of production and productivity due to water scarcity/ flooding before and after the decentralization process?					

8.4 In your opinion, are there some characteristics about this river basin that make it different from other basins in the country?	**Yes**	**No**
8.5 If yes in question 8.4, what are these characteristics and can you please mention the strengths and weaknesses of these characteristics?	**Strengths:**	**Weaknesses:**

Participation of Women and Equity

9.1 In your opinion, please indicate the status of participation of women in decision making *before* and *after* the establishment of the CMA or equivalent	**Before**				**After**			
	Not appl	**No partici**	**Some partici**	**Major partici**	**Not appl**	**No partici**	**Some partici**	**Major partici**

9.2 Describe how women currently participate in water decision-making in the basin?			
9.3 Are there specific performance criteria for the CMA or equivalent to involve women in water decision making in the basin?	**Yes**	**No**	**Not sure**
9.4 If yes in question 9.3, what are these performance criteria?			
9.5 Are there specific activities in the basin which focus on women?	**Yes**	**No**	**Not sure**
9.6 If yes in question 9.5, what are these activities?			
9.7 Are there specific activities in the basin which focus on equity (other than women equity)?	**Yes**	**No**	**Not sure**
9.8 If yes in question 9.7, what are these activities?			

9.9 Do these equity activities focus on? (please tick option)	
Flood / drought control	
WR planning	
Pollution control	

Water monitoring	
Stakeholder participation	
Water allocation	
None of the above	
9.10 If any options selected in 9.9, please could you provide further details?	

ANNEX C: REVIEW, REFINMENT AND UPDATE OF THE ASSESSMENT METHODOLOGY

In this annex we utilize the lessons learnt in the conducting of the IWRM performance assessment in the IRB to review, refine and update the assessment methodology.

C.1 Lessons Learnt in the Testing of the Assessment Tool

Some of the key lessons learnt in the application of the performance assessment tool were:

- **Stakeholder engagement:** Stakeholder involvement in IWRM in all 3 countries was particularly challenging. Despite following a structured stakeholder engagement protocol, to get commitment from stakeholders to participate in the study was incredibly difficult. Various engagements process and avenue were attempt, with poor response from the sector. This could partly be attributed to engagement taking place at the end of the year, before and during the long summer break in the 3 countries. The problem does not however seem limited to this study as in an *Assessment of Integrated Water Resources Management Activities in the Southern Africa Region* the Institute of Water and Sanitation Development, Zimbabwe experience similar difficult in collecting survey data and are quoted as saying that *on 22 July 1997, we sent out 145 questionnaires to selected persons and institutions in the Southern Africa region. By 15 September 1997, we had received 13 filled out forms. During the Water Africa '97 conference held in Harare from 15 to 18 September 1997, we interviewed persons representing 4 organisations which had not responded to our questionnaire. In sum, the questionnaires received and interviews held covered the following countries: Botswana (1), Malawi (1), Mauritius (1), Namibia (1), South Africa (4), Tanzania (1), Zambia (4), and Zimbabwe (4).*
- The language barrier in Mozambique required that the questionnaire first be translated to Portuguese to ensure that the intent of each question was understood. Local expertise were required to conduct the survey in this country, while the South African and Swaziland assessment could by conducted by the research team.
- The current format of the data collection tools (questionnaires) are relatively long and require a significant amount of time to complete (1-2 hours). Some of the questions in the questionnaire also require rewording or more clarity as respondents did not answer the question or misinterpreted the intent of the questions.
- The current format of the data collections tools do not facilitate ease of data capture. Of particular note of the questions related to the performance of the decentralisation process in each of the questionnaires.
- There are currently gaps in the questionnaire, particularly in the change areas of IWRM plans, institutional capacity building and resource assessments.
- The field assessment tool: testing of the tools showed that:
    - The water institutional questionnaire the following are the sections which did not received response:
        - Section 4.11 (estimated cost of dismantling old institutions/creating new local institutions/ creating CMA). A total of 4 stakeholders did not respond to this section.
        - Section 5.3 and 5.4 (Value and percentage of revenue by sector). A total of 5 stakeholders did not respond to this section.

- Section 5.5 (Value and percent payment water tariffs) A total of 5 stakeholders did not respond to this section.
- Section 6 (Financing of CMA). No stakeholder responded to this section.
- Section 8.2 (Percentages of responsibilities for decision making). A total of 4 stakeholders did not respond to this section.
- Section 9.9 (Equity activities). A total of 4 stakeholders did not respond to this section.

- In the case of the stakeholder questionnaire, *he following are the sections which did not received response:*
  - Section 4.8 (estimated cost of dismantling old institutions/creating new local institutions/ creating CMA). A total of 13 stakeholders did not respond to this section.
  - Section 5.2 (frequency of revenue collection). A total of 8 stakeholders did not respond to this section.
  - Section 7.5 (Forms of information sharing). A total of 9 stakeholders did not respond to this section.
  - Section 9.9 (Equity activities). A total of 13 stakeholders did not respond to this section.

C2. Review of the results provided from the Testing of the Assessment Tool

A review of Implementing of IWRM and decentralisation of water management in the three countries using the method develop and tested in this study shows that the methodology applied does provide useful data and information. For example application of the methodology allowed the conclusion to be drawn that all three country had largely created an IWRM enabling environment. This is significant as having the policy and legislative environment in place to facilitate and encourage integrated water resource management is crucial to the sector. However, the piloting of the method did demonstrate that currently, the financial enabling environment is the only weakness, with the mechanisms to ensure water management institution become self-sustaining still being develop or only partially implemented. Mozambique has started to demonstrate the first success of this.

The piloting of the methodology also allowed conclusions to be drawn in the case study related to the implementation of the IWRM institutional framework and roles. However, the method also showed that the change areas within these criteria demonstrate varied levels of success. Institutional structure, roles and responsibility have successfully been articulated in policy and legislation in the basin. Implementation of these policy and legislative IWRM imperatives however remains a challenge. Only some of the decentralised water institutions have been established and are functioning at various level of success. Stakeholder participation does seem to be one of the successes of the institutional framework in the Inkomati basin. Greater attention will need to be paid to capacity building in future IWRM endeavours.

The piloting of the methodology also showed that IWRM management instruments are perhaps, the least develop change areas of the Inkomati case study. This is to be expected as

management instruments are effectively the implementation tools for IWRM. With the implementation of IWRM and decentralisation of water management still relatively new in the Inkomati, one would expect that these management instruments will develop as the IWRM process progress. However the currently conflict resolution mechanisms should be noted, as should the initial regulatory instruments. Much work is still ahead however, particularly within these criteria for IWRM.

C.3 Review and Refinement of the Approach to the Performance Assessment

The hierarchical approach utilised to conduct the IWRM performance assessment was effective in providing a structure manner for analysis and interpretation of the results of the assessment. This hierarchy comprised principles, criteria, change areas and measure.

Review of the hierarchy does however indicate that a level is missing in the current hierarchy, the level of indicator (Figure C1). Including a series of indicators for each change area would clearly articulate which IWRM attribute relates to and thus is utilised to assess a change area. Similarly, indicators would provide clear indications of which measures (questions) are required in the performance assessment tools to measure a change area. For example, in the policy change area of the enabling environment, as series of indicators could be utilises, including:

- Water policies have been developed and updated within the last 5 years
- Number of IWRM water principles included in these policies
- Degree of stakeholder involvement in development of the policies, by stakeholder group (i.e. communities, emerging farmers, etc.

These indicators would thus require that the performance assessment tool include questions such as:

- Related to 1 above, are there water policies? When last was the water policy reviewed?
- Related to 2 above: Does the water policy address: environmental sustainability? How?; etc. for the other principles
- To what degree did the following stakeholder participate in the development/review of the policy – local communities, emerging farmers, WUA, etc.?

The assessment tools (questionnaires) should be designed accordingly to include the indicators level of assessment. Similarly, it would be recommended that the questionnaire be designed in 3 questionnaires, namely, one which addresses the enabling environment, one for institutional framework and one for instruments. It was clear from the testing of the current tools that IWRM is effectively being implemented in a phase approach, firstly the enabling environment is set in place, then the institutional structures are developed and roles defined and then the management instruments are designed and implemented. Hence, each questionnaire could be applied the various stage of IWRM implementation to determine the effectiveness of each phase.

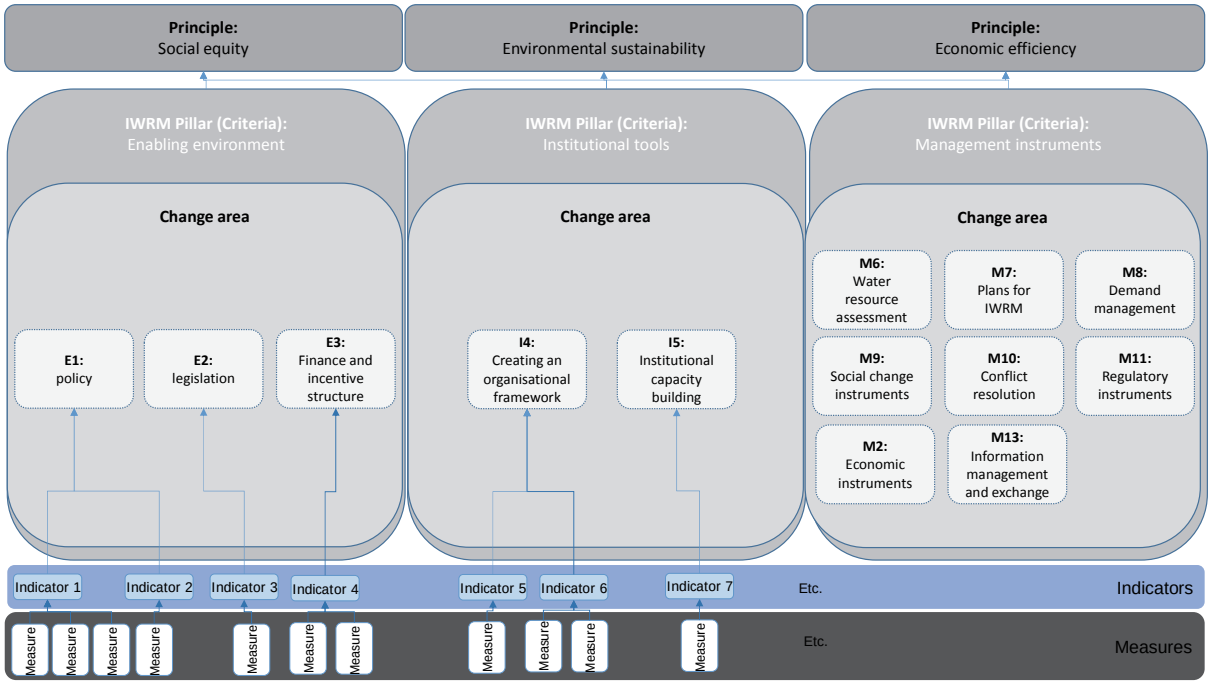

Figure C1: Recommended hierarch structure for assessment of IWRM implementation

ANNEX D. THE STAKEHOLDER ENGAGEMENT PROTOCOL FOLLOWED

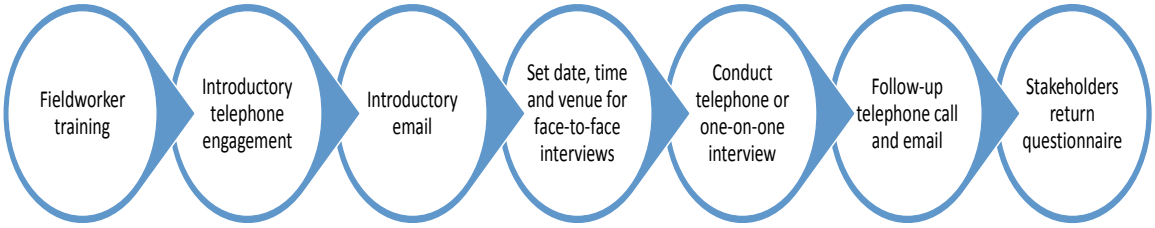

Figure D1: Stakeholder engagement protocol utilised for the fieldwork of this assignment

1. Fieldworker training: training of internal fieldworkers was conducted through their participation in a workshop to review and adapt the original questionnaire. All team members were involved in this workshop to ensure consistence in the understanding and interpretation of the questions in the questionnaire.
2. Contact with stakeholders: the process followed for engagement with stakeholder is as follows:
    a. Initial contact with stakeholders had the purpose to determine their willingness to participate in the fieldwork of this assignment. Stakeholders were telephoned; the assignment introduced to them and asked whether they would be willing to participate.
    b. If a stakeholder was willing to participate, the initial contact phone call was followed by an email which again outlined the purpose of the assignment, provided an introductory letter from the WRC and provided a copy of the questionnaire.
    c. If a stakeholder indicates that they would prefer that the fieldworkers complete the questionnaire together with them, a date, venue and time for this interview was requested in the above email. Interviews were either face-to-face or telephonic (based on the preference of the stakeholder).
3. Due to the slow return of questionnaires from stakeholder, additional telephonic engagements and emails were sent to the relevant stakeholders, with inclusion of submission deadlines outlined in these emails.

ANNEX E: LIST OF STAKEHOLDERS THAT WERE ASSESSED IN THE INKOMATI RIVER BASIN

Stakeholder Category	Country	Stakeholder	Method of fieldwork	No. of questionnaires	Date of fieldwork
Departments and Spheres of Government					
National Government	RSA	Þ Department of Water Affairs	Interview	1	12/02/2014
	Mozambique	Þ DNA-GRI	Interview	1	07/03/2014
		Þ Department of Agriculture	Interview		
	Swaziland	Þ Departments of Natural Resource	Interview	1	02/12/2013
Local Municipalities	RSA	Þ Mbombela	Interview	1	20/02/2014
		Þ Umjindi	Interview	1	19/02/2014
Water Resource Management Institutions					
Basin Management Organisations	RSA	Þ Inkomati Catchment Management Agency	Survey	1	28/01/2014
	SwazilandMozambique	Þ ARA-Sul/UGBI	Survey	1	24/02/2014
	Swaziland	Þ Komati River Basin Authority (KOBWA)	Interview	1	03/12/2013
WB	RSA	Þ Lomati/ Komati Irrigation Board	Survey	1	22/01/2014
Commercial and Emerging Users					
Forestry Companies	RSA	Þ SAPPI	Survey	1	07/01/2014
	Swaziland	Þ Forestry at Peak Timbers Ltd.	Interview	1	02/12/2013
Mining Companies	RSA	Þ Africa Rainbow Minerals (ARM)	Interview	1	06/12/2013
		Þ Assmang Chrome Mine	Interview	1	10/12/2013
Agricultural Companies/Organisations	Swaziland	Þ Mhlume (Royal Swaziland Sugar Corporation)	Interview	1	04/12/2013
Power Generation	Swaziland	Þ Ngonini Estate	Interview	1	06/12/2013
Emerging Users					
Emerging Farmers	RSA	Þ Inkomati Irrigation Forum (IIF)	Survey	1	06/02/2014
	Swaziland	Þ Swaziland Water and Agriculture Development Enterprise (SWADE)	Interview	1	05/12/2013
Environmental Interest Groups					
Environmental	RSA	Þ SANParks	Survey	1	18/02/2014
Environmental NGOs, etc.	RSA	Þ MP Wetland Forum	Interview	1	10/12/2013
	Mozambique	Þ WE Consult	Survey	1	07/03/2014