

**TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO
MAPUTO**

by

ROBYN TOMPKINS

**Submitted in partial fulfillment of the requirements for the degree of
Master of Environment and Development
at the
Centre for Environment and Development
School of Applied Environmental Sciences
University of Natal**

**Pietermaritzburg
2002**

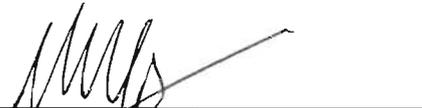
PREFACE

The research described in this mini-dissertation was carried out at the Centre for Environment and Development, University of Natal, Pietermaritzburg, under the supervision of Dr Nevil Quinn.

This mini-dissertation represents the original work of the author and has not otherwise been submitted in any form for any degree or diploma at any university. Where use has been made of the work of others it is duly acknowledged in the text.



Robyn Tompkins



Dr Nevil Quinn (Supervisor)

ACKNOWLEDGEMENTS

I would like to extend my thanks all those who assisted me or supported me during the course of this research, and specifically:

- Dr Nevil Quinn for his guidance and patience in the acceptance of endless phone calls
- Kerry Roberts and David Catherine for their assistance with registration, administration and for their support
- Michael Horswell for preparing all of the maps in this document
- Mr Niel van Wyk and DWAF for sharing their knowledge and experience
- Mr Haroon Karodia for taking time out of his very busy schedule to visit the floodplain and for sharing his knowledge and experience
- All the members of the Lubombo Water Ways Programme and the Water Committees for sharing the wealth of their first hand experience of the Pongolo floodplain
- Dr Mark Dent for enthusiastic discussion and for sharing his considerable experience
- Dr Brian Sharp and Carryn Martin of the Medical Research Council for sharing their knowledge and providing GIS data for Moçambique
- Sandie de Villiers for her guidance in research design

Finally, I would like to thank Jerry, Zoë and Jack for their unstinting support.

ABSTRACT

In the Twenty-first Century, sustainable water management is likely to be humanity's greatest challenge in a world of ever-increasing demand. Legal instruments both international and national regulate and provide a general framework for the use and management of international waters. Future basin management agreements can be informed by examining the degree of success, in terms of sustainability and equity, achieved by such agreements. That success can be influenced by the degree to which such agreements support the human right to water implicitly stated in international customary law, through a collaborative management approach.

Since 1988, attempts by communities on the Pongolo floodplain to be involved in Pongolopoort Dam releases, have met with little success. Recently, the Department of Water Affairs and Forestry has begun to support those efforts, but the approach remains a sectoral one, and is primarily concerned with water issues. The South African National Water Act 36 of 1998 provides for environmental management and public participation, as well as providing explicitly for the rights of individual water users, but its implementation is hampered by an overwhelming emphasis on technical considerations and a lack of political will to embrace collaborative management systems. Little effort is expended on collaborative management methods, though the level of transparency in water management is improving, despite remaining highly centralised. The level and extent of incentives for local community participation is low, and systematic monitoring is in its early development.

International river basin agreements generally take a top-down or state-driven approach, though there are some examples where local cross-border communities have participated successfully in the implementation of international agreements and management of transboundary basins.

South Africa, Swaziland and Moçambique signed the Interim Incomaputo Agreement, which includes the Maputo basin, in August 2002. Once again, the approach to this agreement has been highly sectoral in that negotiations were handled entirely by water officials in the relevant countries. A lack of transparency has prevailed in the negotiation stages, though through the basin studies, which will inform implementation plans, the level of participation should improve.

There is overwhelming consensus that integrated management is the key to sustainable international river basin management. Formal and systematic methods for inter-departmental communication, both nationally and internationally are currently not being implemented, which has significant negative impacts on integrated management.

Research in this area represents an opportunity to explore collaborative management of an international river basin in an area that is, as yet, unstressed in terms of population and water supply.

COMPONENT A

**TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO
MAPUTO**

by

ROBYN TOMPKINS

**Submitted in partial fulfillment of the requirements for the degree of
Master of Environment and Development
at the
Centre for Environment and Development
School of Applied Environmental Sciences
University of Natal**

**Pietermaritzburg
2002**

CONTENTS	Page
CHAPTER 1: OVERVIEW	1
1.1. Introduction	1
1.2. Problem statement	2
1.3. Aim and objectives of this study	3
1.4. Structure	4
CHAPTER 2: METHODOLOGY	5
2.1. Introduction	5
2.2. Procedure	5
2.3. Sampling	5
2.3.i) Interview list	6
2.4. Methods of observation and data collection	7
2.4.i) Interview Methodology	7
2.5. Methods of data collation, synthesis and analysis	7
2.5.i) Conceptual Framework	8
2.6. Assumptions and anticipated problems	13
CHAPTER 2: HISTORICAL CONTEXT	14
3.1. Introduction	14
3.2. Physical description of the area of study	14
3.3. Brief history of the Pongolo / Rio Maputo Basin	15
3.4. The effects of the Pongolopoort Dam	19
3.5. Floodplain management principles	22
3.6. Conclusion	23
CHAPTER 4: LITERATURE REVIEW	24
4.1. Introduction	24
4.2. Sustainable use of water	24
4.3. Conflict, power and national sovereignty: The "theirs and ours mentality"	26
4.4.i) Water and conflict	26
4.4.ii) Sovereignty	27

4.4.i.a) The “all or nothing approach”	27
4.4.i.b) The “no-harm” principle and equitable utilisation	28
4.4. The Development of international water law	28
4.2.i) The United Nations Convention on the Law of the Non-navigational uses of International Watercourses	29
4.5. Regional agreements and National Law	30
4.5.i) The SADC Protocol	31
4.5.ii) National Water Law: Moçambique and South Africa	32
4.6. Transboundary water agreements	34
4.9.i) An analysis of selected transboundary water agreements	34
4.9.ii) What, therefore, must change in transboundary water agreements?	43
4.9.iii) Conclusion	46
4.7. Water and human rights	47
4.8. A Strategy for sustainable resource use	48
4.8.i) Power relations between states	50
4.8.ii) Power relations within states	50
4.8.iii) Environmental management	51
4.9. Collaborative management of water resources	53
4.8.i) Partnership or panacea	53
4.8.ii) Indigenous approaches to water management	54
4.10. Synthesis	56
4.11. Conclusion	57
References	58
Footnotes to Table 4.3	62
Personal Communications	64
Appendix 1: Interview and interviewee details	
Appendix 2: Interview transcriptions	
Appendix 3: Community participation assessment	
Appendix 4: Interim Incomaputo Agreement	

LIST OF ABBREVIATIONS

DNA	Direcção Nacional de Aguas
DWAF	Department of Water Affairs
ELMS	Environment and Land Sector (in SADC)
NWA	Republic of South Africa, National Water Act no. 36 of 1998
EIA	Environmental Impact Assessment
GCI	Green Cross International
GIS	Geographic Information Systems
SAWEG	Sahelian Wetlands Expert Group
IBWC	International Boundary and Water Commission
ICPR	International Commission for the Protection of the Rhine
IJJWC	Israel-Jordan Joint Water Commission
IUCN	The World Conservation Union
NGO	Non-governmental organisation
OKACOM	Okavango River Basin Commission
SADC	Southern African Development Community
TDA	Transboundary Diagnostic Assessment
TPTC	Tripartite Permanent Technical Committee
UN	United Nations
WA	Moçambique, Water Act Lei no.16/91
WSCU	Water Sector Coordination Unit (in SADC)
UDHR	Universal Declaration of Human Rights
ZACPLAN	The Zambezi River Action Plan
ZRA	Zambezi River Authority

LIST OF FIGURES

	Page	
2.1	Conceptual framework	9
2.2	Methodology process diagram	11
2.3	Methods, objectives and opportunities for triangulation	12
3.1	Broad-scale map of the Pongolo River / Rio Maputo	13
3.2	Fever trees at Nyamithi Pan	15
3.3	Fonya drive in a Pongolo Pan	16
3.4	Land use and land cover of the Pongolo floodplain	17
3.5	Land use and land cover in southern Moçambique	18
3.6	Population and infrastructure in southern Moçambique	19
3.7	Pongolapoort Dam	20
4.1.	Transboundary river basins in Africa	30
4.2	A strategy for sustainable resource use	49

LIST OF TABLES AND BOXES

Table		Page
2.1	Interview list	6
4.1	Comparison of aspects of National Water Law in South Africa and Moçambique	32
4.2	Institutional agreements selected for analysis	33
4.3	Analysis of selected transboundary river basin agreements	37
Box		
3.1	Outline of SAWEG Floodplain Management Guidelines	22
4.1	Criteria for sustainable water use	24
4.2	Water and the Gulf War	26

CHAPTER 1: OVERVIEW

1.1. INTRODUCTION

“The world’s disparate cultures are linked by a factor common to all of us: dependence on water” (Dowdeswell 1998:13). Scientists, environmentalists, researchers and poets, when they write about water, often describe water as “life”, and yet, only 2.5% of all the water in the world is fresh water (Kuylentiera & Najlis 1998). By 1996 world water withdrawals amounted to 54% of available runoff, a seven-fold increase from the end of the nineteenth century (Postel *et al.* 1996 in Gleick 1998). The finite nature and uneven distribution of the earth’s fresh water resources imparts a darker aspect to water in the modern, overpopulated world, however, that of power and conflict over water in the world’s some 300 international river basins (Green Cross International (GCI) 1999). Given that nearly half of the land in the world (excluding Antarctica) falls within international river basins (Dowdeswell 1998), sustainable use of water represents a significant challenge to humanity, in which the prize is survival.

The criteria for sustainable use of water outlined by Dowdeswell (1998) and Gleick (1998), advocate above all, the concept of ‘fair share’ of water across all nations and within them. To this end, various legal instruments at international, regional and local levels have been instituted. Few have proved adequate in addressing the problem. Interpretations of national sovereignty, and the strategic necessity of water have generated conflicts over water across borders around the world, and the situation is becoming increasingly urgent, given that over one billion people do not have access to potable water and two and a half billion do not have adequate sanitation services (Gleick 1998).

The environmental consequences of unsustainable water use and development, coupled with the far-reaching effects of the pollution of the world’s major river basins highlight the need for an international perspective on the world’s shared water resources. Despite the some 300 treaties dealing with water allocation, management, use, flood management or hydropower, few have resulted in successful sustainable water management of international river basins (GCI 1999).

This research is concerned with the Pongolo River / Rio Maputo, in the area known as the Maputaland Plain, which stretches from the foot of the Lebombo Mountains in South Africa, to the Bay of Maputo in Moçambique. A transboundary agreement, which includes the Maputo basin, was signed on 29th August 2002. It will, however, have little impact as yet, as a comprehensive basin

study is yet to be conducted (van Wyk *pers. comm.* 2002). Given current understanding of transboundary management and the existing communication and legislative structures, there is a significant opportunity for the formulation of a new and more effective approach.

1.2. PROBLEM STATEMENT

South Africa and Moçambique are both signatories to the 1995 SADC *Protocol on Shared Water Resources* (Revised 2000), which sets out a framework for the use and management of such resources. Equitable exploitation of the resource is a primary principle of the Protocol, though no guidelines for its application are provided. The South African National Water Act 36 of 1998 (NWA) also requires that South Africa meet its international obligations to countries, which share water resources with us. The NWA also requires the Department of Water Affairs and Forestry (DWAF) or a catchment management agency to maintain the calculated Reserve of the water resource. The Reserve is the quantity and quality of water that must remain in the water resource to serve the needs of the environment and the basic human need for water. Before authorising the use of water from a resource, a preliminary determination of the Reserve must be made.

Both the NWA and the SADC Protocol make provision for formal transboundary management structures for shared water resources, established with participation from the relevant stakeholders. Following the signing of the Incomaputo Water Sharing Agreement at the World Summit in 2002, the Tripartite Permanent Technical Committee (TPTC) became the management organisation for the Maputo basin. Within that agreement, however, there are no provisions to allow communities to have control over the decisions made with regard to the water resources in their area.

In July 2000, DWAF in South Africa informed Moçambique through the Joint-Liaison Committee in Pretoria, that there would be a release from Pongolapoort Dam in September 2000. Moçambique requested that there be no flood greater than $85\text{m}^3\text{s}^{-1}$, as their levees along the Rio Maputo were damaged and any flow greater than that would inundate desperately needed agricultural lands near the banks (Arendse *pers. comm.* 2002). The DWAF Head Office in Pretoria informed the Regional Office in Durban, who are the dam's controlling authority that they were to accede to the wishes of Moçambique. There was no consultation with the stakeholders on the Pongolo floodplain, simply a notice that there was to be no release (Poultney *pers. comm.* 2002). The result was that there was no release from the dam from October 2000 to July 2002, leaving residents of the Pongolo River floodplain on the South African side of the border with no water for domestic or agricultural use. The

sensitive floodplain ecosystem is dependent on what was a natural flooding process, which flushed and replenished the pan system. In the absence of a natural flooding regime since the dam's construction, the ecological processes on the floodplain are dependent on the release regime of the Pongolopoort Dam (sometimes referred to as the Jozini Dam). No releases in almost two years (Arendse; Poultney; Bruwer *pers. comm.* 2002) have resulted in considerable environmental deterioration, as well as serious water shortages for domestic and agricultural use. This in turn, has led to discord between the water authorities and stakeholders on the floodplain and between residents on the floodplain and Moçambique.

The Incomaputo agreement (Appendix 4), while offering an opportunity for state communication, is a broad-based agreement between Moçambique, Swaziland and South Africa, encompassing two large river basins, the Incomati and the Maputo. The livelihoods of the communities in the area of study, a largely rural area, depend on its natural resources, which depend on effective water management. On the South African side, there is a history of local participation in releases from the dam.

Effective and sustainable management on the Maputaland plain could provide an opportunity for informing river basin management in other areas, given that the flow of the Pongolo / Maputo can be controlled to an extent by the Pongolopoort Dam, the emerging research in stakeholder co-management of water and natural resources, and the area's relatively 'unstressed' status as regards water availability and use.

1.3. AIM AND OBJECTIVES OF THIS STUDY

i) Aim

To establish the critical elements of effective transboundary water resource management of the Pongolo River/Rio Maputo.

ii) Objectives

- To examine current trends in international transboundary water resource management structures and new directions in their application
- To identify and assess selected existing regional and international transboundary communication or resource management structures

- To identify the stakeholders and water uses of the Pongolo River / Rio Maputo in South Africa and Moçambique
- To identify existing resource management and institutional structures in South Africa and Moçambique
- To assess the legislative, cultural and logistical constraints to or benefits for water resource management of the Pongolo River/Rio Maputo
- To determine the key participants of a management structure for the Pongolo River/Rio Maputo
- To provide recommendations for water control authorities in this area of the basin
- To indicate areas for further research

1.4. STRUCTURE

Chapter 2 explains the methodology under which this research was conducted, and an explanation of the primarily qualitative techniques which were used. Chapter 3 provides the background to the problem and the historical context of the area in which the research was conducted. Chapter 4 comprises a literature and legislation review of transboundary water resource management agreements and international and regional law, as well as areas of theory which pertain to them.

CHAPTER 2: METHODOLOGY

2.1. INTRODUCTION

This research explores the critical elements for transboundary water resource management in the Maputo basin, on the lower reaches of the Pongolo River / Rio Maputo. In essence, this research is a case study, since it will be a “detailed, varied and in-depth” (Neuman 2000:32) exploration of one small area of the Maputo basin in the context of international applications of and debate around transboundary water resource management.

2.2. PROCEDURE

A literature review was conducted to assess policy and legislation application in practice in water management internationally, regionally and locally. Given that transboundary water resource management has shown significant development since 1996, only documents from that date were reviewed. Following a legislative review of local water and environmental laws, as well as regional protocols and international conventions and selected transboundary agreements (Chapter 4 of this document), GIS data were examined to contextualise geographic, demographic and land-use characteristics of the area. Subsequently, interviews were conducted according to the list in Table 2.1.

2.3. SAMPLING

This research used purposive sampling, as it is qualitative and exploratory research in a specific area. In-depth interviews were conducted with representatives from government institutions responsible for the control of water resources, government and parastatal organisations responsible for natural resource management and specialist consultants in the field (Table 2.1). The interviewees were selected from both regional and national water authorities, specifically those dealing with the area of study or with the recently signed Incomaputo agreement (which includes the Maputo basin). Members of existing water and agricultural institutions on the floodplain were also selected, as were specialist consultants working in the area of study. Dr Brian Sharp was interviewed as the Director of a regional programme in another sector (Health) and Dr Mark Dent as a specialist consultant in collaborative management techniques. The remoteness of the area, language barriers and time constraints made it impossible to interview community groups, though

participation in a workshop in the field gave the researcher some insight into the concerns of the local community on the South African side. GIS demographic, land-use and geographic data related to that area were used to contextualise the qualitative data obtained from in-depth interviews.

i) **Interview list**

Table 2.1: Interview List

Name	Position
Mr Francisco Alvaro	Moçambique Liaison to Tripartite Permanent Technical Committee (TPTC)
Mr Clive Arendse	Control Technician, Northern Catchment Management area, KwaZulu-Natal Department of Water Affairs and Forestry
Mr Charel Bruwer	Environmental management consultant, previously with DWAF (release controller for Pongolopoort Dam until 1998)
Mr. T. J. Buthelezi	Resident of the Pongolo floodplain, Chairman of POWADETA and the Ubongwa Board (cotton and subsistence farmers on the Pongolo floodplain), Chairman of the Makhatini Farmers Association, GM cotton farmer.
Dr Mark Dent	Consultant in Water Resource and Collaborative Management, previously of Computing Centre for Water Research
Ms Lorraine Fick	Senior Specialist, Social and Ecological Services Directorate, DWAF
Mr Haroon Karodia	Chief Director Environmental Management, KwaZulu-Natal Department of Agriculture and Environmental Affairs.
Mr Jeremiah Mabika	Farmer and member of the Welcome Water Committee
Dr Beason Mwaka	Chief Engineer, Systems Operations, Eastern region, DWAF
Mr Clive Poultney	Consultant, residents and founding member of Mboza Village Community Project on the Pongolo floodplain
Dr Brian Sharp	Director of the Regional Malaria Control Commission (Community driven malaria control programme)
Mr Niel van Wyk	South Africa Liaison to the TPTC, Director of Water Resource Planning (DWAF National)
Mr Andrew Zaloumis	CEO Lubombo Spatial Development Initiative

2.4. METHODS OF OBSERVATION AND DATA COLLECTION

Literature review information was analysed into process and conceptual diagrams and comparison tables of legal frameworks were provided. In-depth interviews were conducted across a range of stakeholders. The researcher was a participant observer in these interviews, allowing the ideas and experience of the interviewee to guide the interviews. Spatial GIS data are provided to illustrate demographic, land-use and water use characteristics of the area.

i) Interview methodology

Interviewee details and information regarding the interview itself were collected for each interview and provided as Appendix 1 to this document. Questions lists for each interview were prepared, but owing to the informal nature of the interviews, were used as a guide to the researcher only, as questions in the guide were often answered during the course of the discussion with the interviewee.

Interviews were recorded on tape and with notes, depending on whether the interviewee allowed tapes. If so, the interviewee was notified at the beginning of the interview, that should they wish to speak "off-the-record", the tape would be switched off. Taped interviews were transcribed and provided as an Appendix 2 to this document. Where interviews were not recorded, notes to all the questions asked are attached in Appendix 2.

2.5. METHODS OF DATA COLLATION, SYNTHESIS AND ANALYSIS

Data and information was analysed according to the method of grounded theory, which can be described as "theory that is built from data or grounded in the data" (Neuman 2000:146). Grounded theory is a method of qualitative data analysis in which the data are organised into analytical categories that "address the research questions, that are mindful of the research literature, and which will allow the greatest amount of data to be coded without either forcing them into categories or having categories that are so sprawling as to be virtually meaningless" (Arksey & Knight 1999:162). This is the first stage of grounded theory analysis, after which further data are collected with a view to refining the analytical categories (Arksey & Knight 1999).

Although the area of study is relatively small, in a physical sense, the complexities and wider dimensions of transboundary water management must be considered and related to the study area. As a result of this, the interviewees selected are not from a homogenous group and a varied range of

stakeholders, types and levels of expertise and disciplines require integration in this research. Because different questions were asked of each interviewee, according to their expertise and activities, the interpretation of the interviews was made according to the themes which arise from the conceptual framework (Figure 2.1), in order to synthesise some of the primary concerns of this complex area of study. As a result, this research will allow only some elements of the accepted grounded theory analysis procedure to be used, primarily the idea that grounded theory “start[s] out with a research question and little else” (Neuman 2000:144). Consequently, the researcher developed the methodology for data analysis as follows.

i) Conceptual Framework

Figure 2.1 describes the conceptual framework, derived from preliminary readings for this research, so as to define the scope of the literature review in Chapter 4, where its theoretical elements are examined. The elements of this framework dealing with release and floodplain management, the consequences of large dams, and those specifically related to the area of the study are explored in Chapter 3. Although the framework does not advocate a specific theory, it is grounded in the idea that collaborative management based on human rights principles is critical to effective transboundary management.

While international and regional conventions and protocols “contribute to the means of finding and reaching solutions to international water problems” (de Chazournes 1998:1), such instruments must be integrated with the emerging principles of environmental and water management. They provide a framework for basin management institutions, while national law gives effect to these principles and conventions and ensures the rights of local users are upheld. In this way, an integration of legal instruments and natural resource management principles can inform the development of collaborative management systems for international basins, incorporating management requirements “in the context of each particular watercourse” (Mohammed-Katerere 2001:43). Accordingly, implementation can be improved through local user participation, in moving toward a human rights approach to international basin management.

Essentially, therefore, the conceptual framework is two-tiered in that it comprises both elements of legislation and management systems theory, which have been used to inform the development of existing transboundary agreements and management organisations which are analysed in Chapter 4. The practical application of those systems study area comprises the second tier of the conceptual framework.

An analysis of the selected international river basin agreements and organisations was synthesised from sources which include the text of the agreements themselves, news articles reporting on current conflicts in the basin, scientific papers, conference session discussions, project proposals and reports and transboundary natural resource management reviews.

In terms of management of the area of study, however, three major themes arise from the conceptual framework:

- Transboundary management institutions
- Institutional and management structure of the area of study
- Water and natural resource management in the area of study

These were used to evaluate the current status of transboundary management of the Pongolo / Maputo River from the interview and field data collected. From that analysis, gaps in current practice can be identified, especially with a view to informing the planned basin study to be carried out as a result of the Incomaputo agreement. The following questions were applied to the collected interview and GIS data:

- What is the current status of each major theme?
- What constraints exist to the practical application of this theme?
- What constraints can be overcome given the available resources (human, natural or financial)?

A long-term project in West Africa, the Sahelian Wetlands Expert Group, which worked in an area similar to the area of study, has produced guidelines for both basin-wide integration and community participation in floodplain management (IUCN/AfDB 1999), which is provided in Appendix 3. These guidelines were used to evaluate current status and practice in basin-wide integration and in community participation in the area of study. The results of the analysis described above were evaluated according to those guidelines. A stakeholder analysis compiled from fieldwork and interviews is set out in tabular form. The results of these combined analyses were applied to the Strategy for Sustainable Resource use set out in Chapter 4, to determine the progress of transboundary water resource management in the area of study according to that strategy.

An explanation of the methods, objectives and opportunities for triangulation is set out in Figure 2.3.

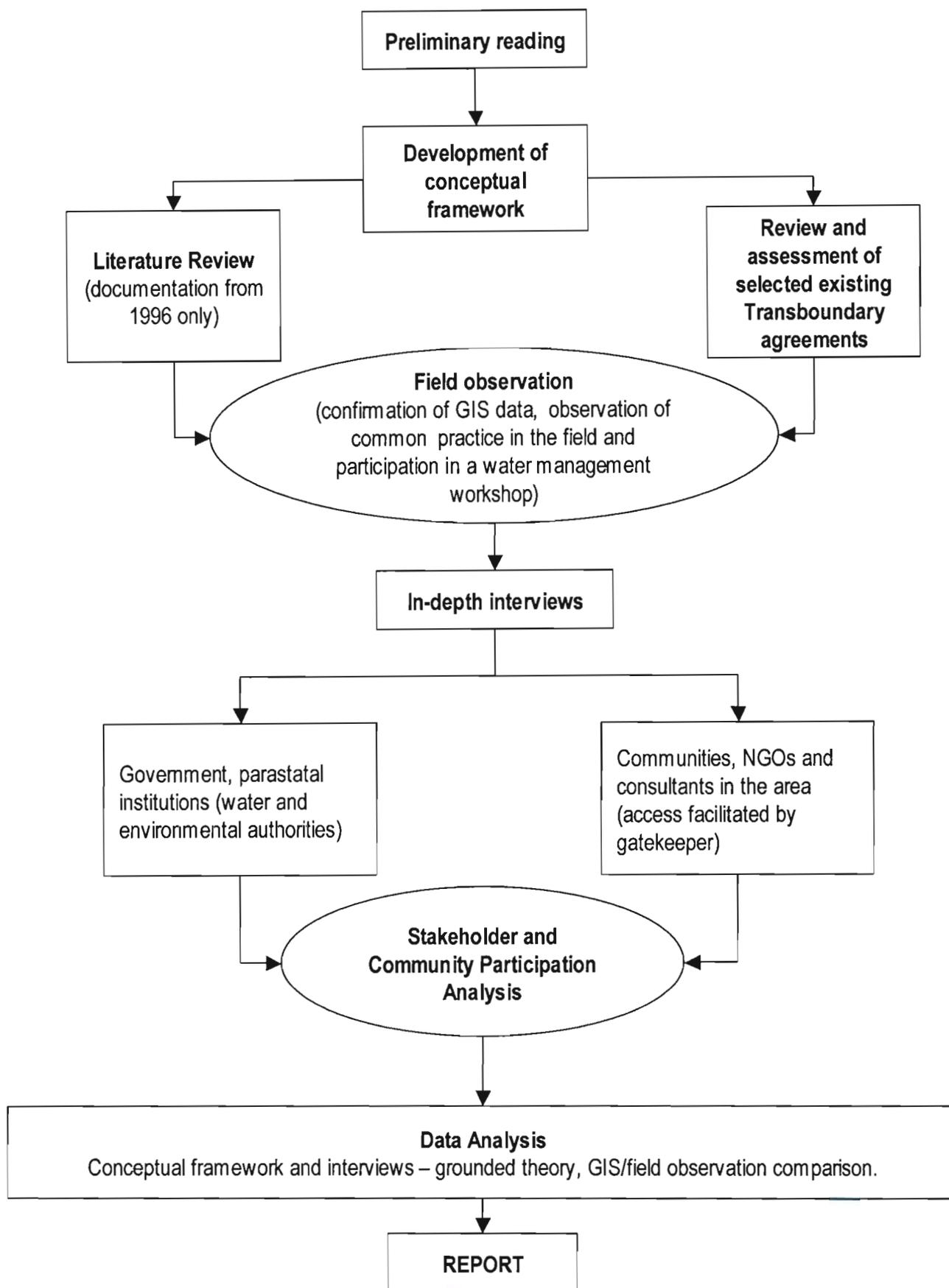


Figure 2.2: Methodology process diagram

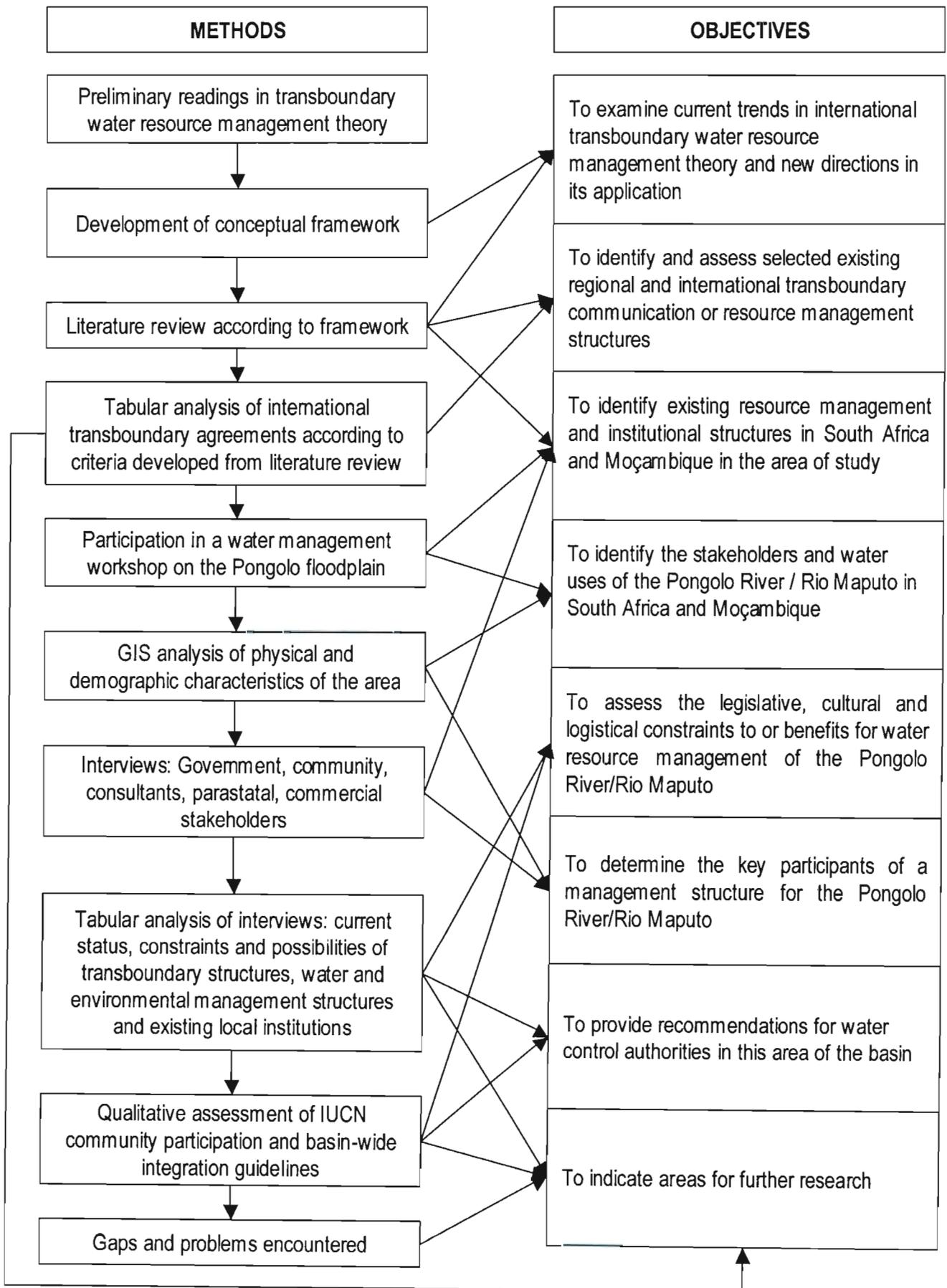


Figure 2.3: Methods, objectives and opportunities for triangulation

2.6. ASSUMPTIONS AND ANTICIPATED PROBLEMS

The most significant assumption was that the researcher would be able to gain access to stakeholders in Moçambique. The problems are that the area is remote, so communities are difficult to access and language barriers make communication difficult. Though attempts were made to interview water authorities in Moçambique, it was not possible to do so given time constraints. Some insight was gained into the community structures in southern Moçambique through information provided by Dr Brian Sharpe, but this was related to the Regional Malaria Control Programme, and not to water issues. As a result, it is assumed that institutional structures for community participation in water management in the area of study are rudimentary, if they exist at all.

Although this research is limited to the Pongolo River / Rio Maputo, the river is part of the larger Maputo Basin and includes the Usuthu River, which flows through Swaziland before forming the northern border of South Africa with Moçambique. The Usuthu then joins the Rio Maputo along the northern border of Ndumu Game Reserve. There are unconfirmed plans for an impoundment on the Usuthu (Perkins *pers. comm.* 2002), which could affect flow in the Rio Maputo. These elements may be critical, and because of time constraints, are not included in this research.

Once again, because of time constraints, only the area below the Pongolopoort Dam was researched. The reasoning for this is that the Pongolopoort reservoir is a large one, $2500 \times 10^6 \text{m}^3$, (Heeg & Breen 1994) and releases can be and are controlled from the dam. The area below the dam is significantly different, physically, from the area above, in that it forms the Pongolo floodplain, a unique floodplain system that has degenerated through a lack of effective release control. Because of the size of the reservoir, releases of sufficient quantity to support ecological processes and human needs can be achieved. In Moçambique, the area forms the sparsely populated Futi wetland system, similar in geographic and land-use characteristics, and in climate, to the South African side. Consequently, management principles generated as a result of research on the South African side can be applied to a similar area in Moçambique, though adjustments may be required for the prevailing economic and socio-political conditions there.

CHAPTER 3: HISTORICAL CONTEXT

3.1. INTRODUCTION

In its lower reaches, the Pongolo River / Rio Maputo flows through a remote rural area populated primarily by subsistence farmers, though some commercial agriculture takes place on the Maputaland plain. It is an area of unique biological and cultural diversity, and outstanding natural beauty (Heeg & Breen 1982). The relationship between the communities in the area near the borders has been little affected by the border, and people have moved back and forth for centuries. Informal trade across the border still takes place and pedestrians cross the border in numbers on a daily basis (Godwin 2001). This chapter outlines a brief history of the area known as the Maputaland plain and examines the effects of the Pongolopoort Dam on the cultural and ecological processes of the floodplain.

3.2. PHYSICAL DESCRIPTION OF THE AREA OF STUDY

From its source in Mphumalanga (Figure 3.1), South Africa, some 2200m above mean sea level (Heeg & Breen 1994), the Pongolo River flows eastward through a narrow gorge between the

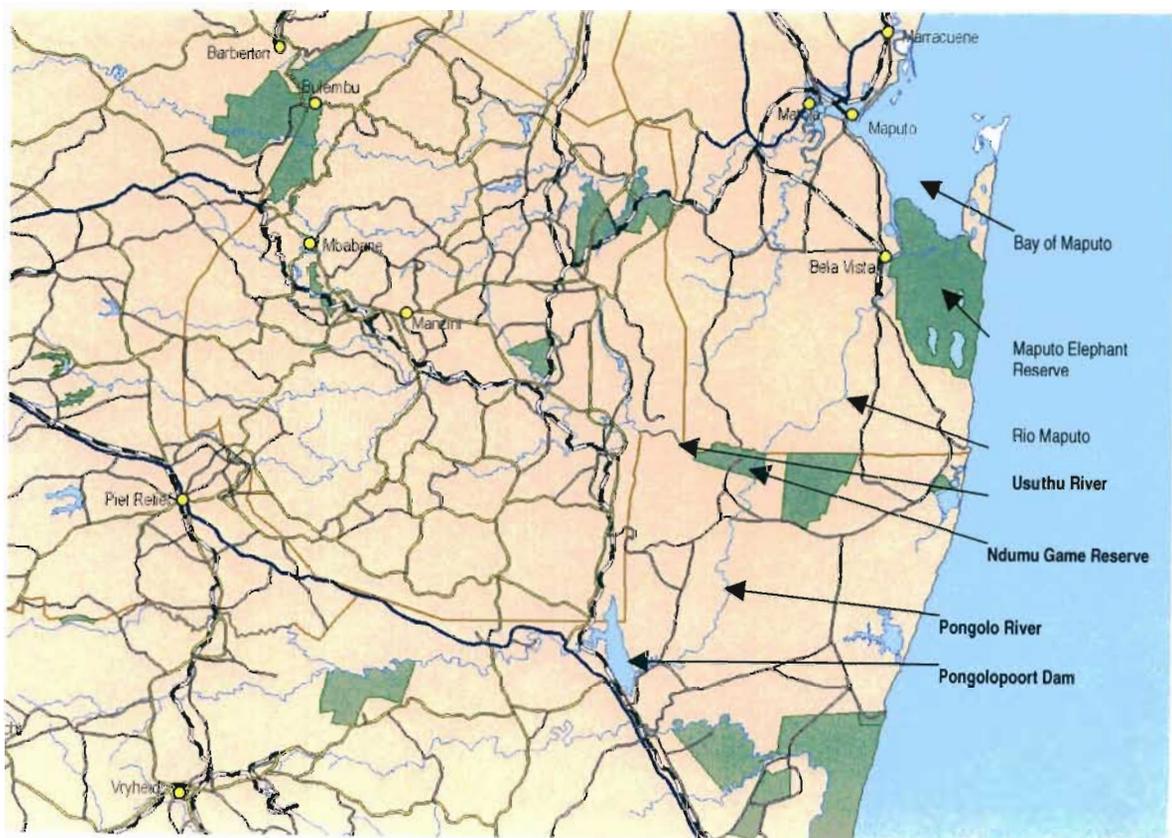


Figure 3.1: Broad-scale map of the Pongolo River / Rio Maputo

Lebombo and Ubombo Mountain ranges, where it turns northward. Approximately 100km north of the gorge, the Pongolo joins the Usuthu River, which forms the South Africa / Moçambique border. The river becomes the Rio Maputo, which continues northward until it reaches the Indian Ocean on the southern arc of the Bay of Maputo.

The land through which the river flows is an area of unique natural beauty, of sand and fever tree forest, wetland pans (Figure 3.2) and panoramas of primordial African bush. It is also an ecologically important area of high biodiversity comprising two important centres of biodiversity, the Maputaland Centre and the Pondoland centre (van Wyk 1994). These areas have distinct fauna and flora and



Figure 3.2: Fever trees at Nyamithi Pan (www.classicafrica.com)

many tropical species reach the southernmost limit of their range in the Maputaland centre, which reaches as far south as St Lucia and Mtunzini.

3.3. BRIEF HISTORY OF THE PONGOLO / RIO MAPUTO BASIN

The amaThonga people settled the area in the 1650s, though it was eschewed by the Zulu people because of the presence of ngana (sleeping sickness), which made it unsuitable for the grazing of their livestock. Because of its geographical features, the Lebombo Mountains to the West, the sea in the east and the swampy land to the north and south, the area was isolated until technological advances made new settlement possible (Breen, Dent & Mander 1998).

Prior to these developments, the isolated nature of the area and the floodplain residents' reliance on the resources of the river and pan system meant that their lives were regulated to a large extent by the flood regime of the river. Natural forces, such as the summer flooding of the plain as well as geographic isolation, and the harsh natural environment, ensured equitable distribution of what were considered communal resources, grazing exposed by the receding floodwaters, fish which breed in the pans, crops farmed on the floodplain (and above the flood level) and resources provided by the forest adjacent to the floodplain, such as fuel or medicinal plants (Breen *et al.* 1998). As a result of their limited technology (Figure 3.3) and the inclement natural processes, the amaThonga people were forced to develop a society interdependent with the natural environment and consequently were able to live sustainably and equitably on the floodplain.



Figure 3.3: Fonya drive in a Pongolo Pan (www.wildlife.up.ac.za)

The traditional barriers to settlement of the area began to break down in the 1950s, when health care advances began to ameliorate the effects of disease, farming technology began to improve and new people began to settle in the area. Most significant for the floodplain was the emergence of the apartheid policy of the Nationalist government.

The apartheid government in the 1950s allocated approximately 30000ha of State Land on the Makhatini Flats to white sugar cane farmers for a job creation program, and in an attempt to create a 'stable' area along the borders of Moçambique and Swaziland (Perkins & Arendse 2001). The rest of the land on the floodplain in South Africa remains Tribal Land.

Community land-use activities are primarily subsistence farming, with a small commercial component, especially in terms of cotton (Figure 3.4).

The extensive pan system, fed and flushed almost entirely by releases from the Pongolopoort Dam (some pans are fed by tributaries or have their own catchments), is the only available water for the some 120000 people living in the area. It is also an important wetland habitat for wild waterfowl and an area of high biodiversity. Ndumu Game Reserve is listed as a Ramsar site or Wetland of International Importance.

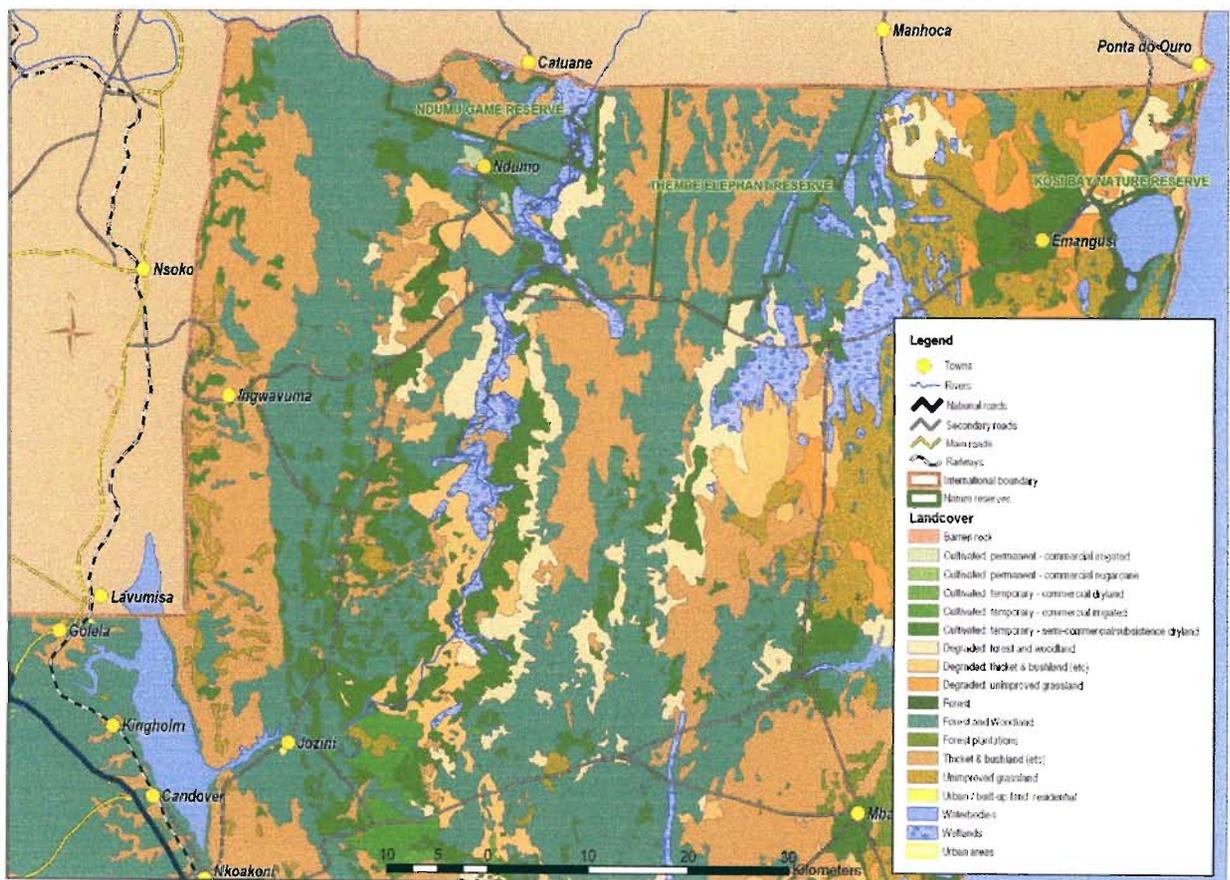


Figure 3.4: Land-use and land cover of the Pongolo floodplain

Source: Thompson 1997. National land cover dataset

The land through which the river flows on the Moçambican side (Figure 3.5) of the border is rural and sparsely populated. The area is a “largely uninhabited, untouched territory banded by the sea on one side and the Futi Wetlands on the other” (Godwin 2001:16).

Land use activity is limited primarily to subsistence farming, although there is some irrigated land around the town of Salamanga, along the banks of the river, and Catuane, close to the South African border and a very small area of non-irrigated cropland along the edges of the irrigated land. There is a predominance of marsh and wetland throughout this area, through to the mangroves in the Maputo Elephant Reserve at the mouth of the river and of which the river forms the western border.

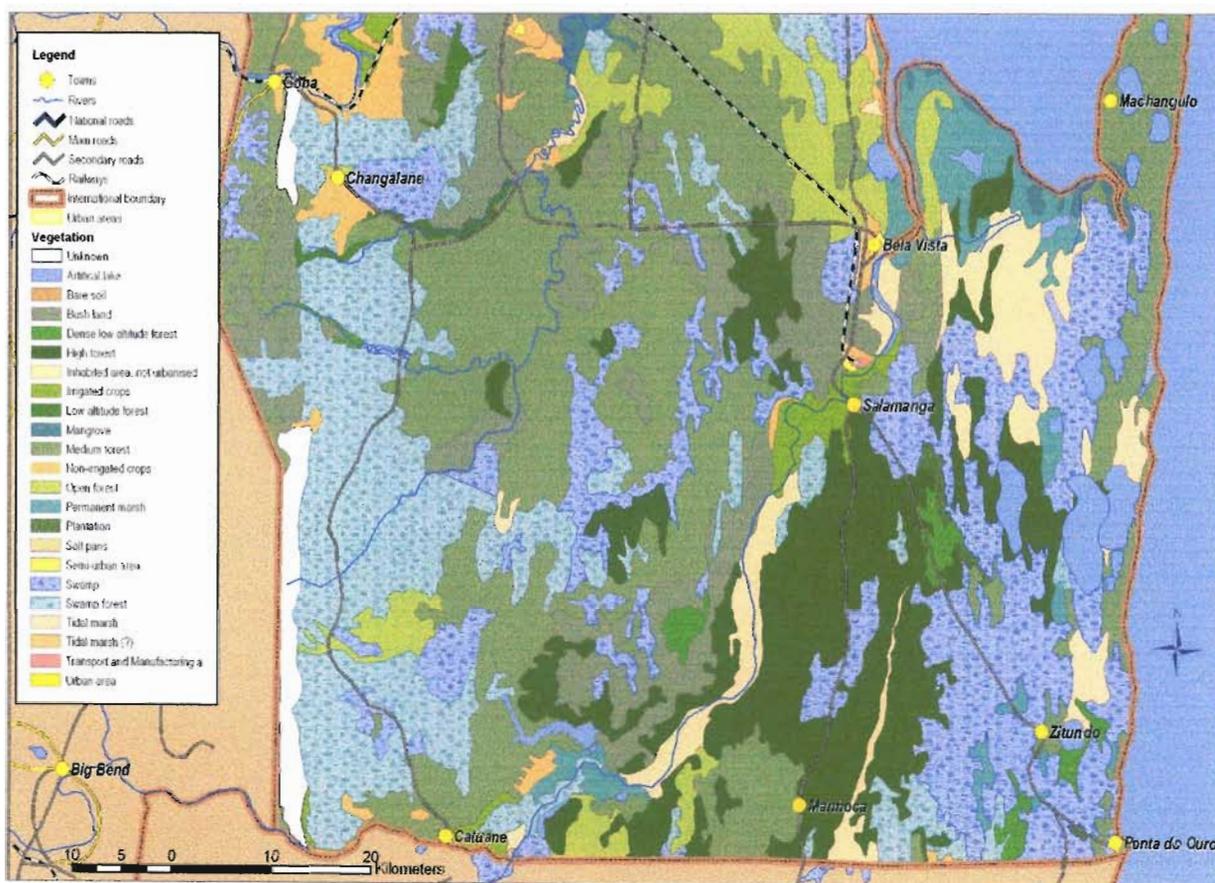


Figure 3.5 Land-use and land cover in southern Mozambique

Source: Direceao Nacional de Geografia E Cadastro, Ministry of Health (Maputo), Medical Research Council

In Mozambique, the area was named *Terra dos Fumos* or Land of Smoke, which was caused by the local Thonga people's slash-and-burn agricultural methods, a method which remains in practice in southern Mozambique (Godwin 2001). Many of the inhabitants moved into South Africa during the war, and then "moved back to Mozambique to farm when peace came", as farmer William Tembe explained to Godwin (2001:12). The area was mined during the war and, though most of the mines have been lifted, there are occasional incidents when new soil is tilled (Godwin 2001:12).

The area is largely rural, with small towns and villages concentrated around the river. 2002 population census figures show that there are less than 37000 people living in the three provinces through which the Maputo River flows (Figure 3.6). The highest population density is north of Salamanga in Missevene province, where the railway line to Maputo begins. There are few roads in this area, all of them secondary, and very little infrastructure.

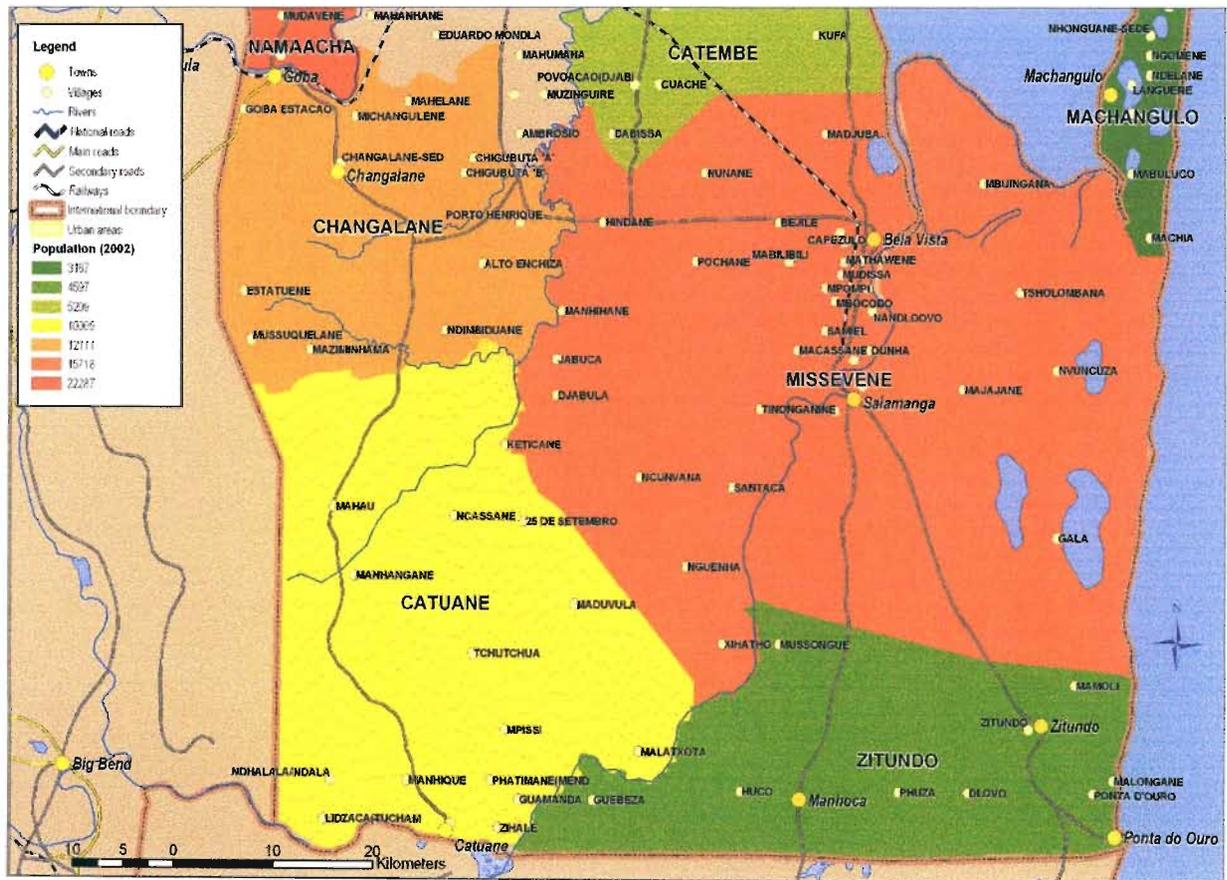


Figure 3.6: Population and infrastructure in southern Mozambique

Source: Direcao Nacional de Geografia E Cadastro, Ministry of Health (Maputo), Medical Research Council

3.4. THE EFFECTS OF THE PONGOLAPOORT DAM

Because of the erratic water supply, and the fact that soils were more than adequate for agricultural development, the apartheid government in the 1960s begun plans for an impoundment on the Pongolo River (Figure 3.7). No environmental impact assessment was carried out and no communication with the people living on the floodplain was entered into at all (Bruwer & Jordaan 1994). The Pongolapoort Dam was completed in 1972. It has a capacity of $2500 \times 10^6 m^3$, and at full

capacity the inundated area extends from just south of Jozini across the Swaziland border near Golela (Heeg & Breen 1994).

The dam formed a reservoir, which extends from just south of the town of Jozini in northern KwaZulu-Natal, to the area near the town of Lavumisa in Swaziland. Its completion brought the capricious natural resources and the inhospitable flow regime of the Pongolo River under human control for the first time. Because of the lack of environmental assessment and management plans, neither of which were commonplace at the time (Bruwer & Jordaan 1994), the environmental, social and economic effects on those living downstream of the dam were not considered.



Figure 3.7: Pongolapoort Dam (www.zululand.kzn.org.za)

As a result of a drop in sugar prices in the 1970s, the white sugar cane farmers failed to occupy the area (Perkins & Arendse 2001) and consequently, the planned irrigation infrastructure was not developed. At the same time, increasing pressure from tribal groups as to land ownership stalled planned developments (Breen *et.al.* 1998).

For the first 13 years after the Pongolapoort Dam was built, the lack of agreement with Swaziland made it impossible to fill the dam to more than 30% of its total capacity, and the three gates at the bottom of the wall which were available at that capacity could only release a total of $85\text{m}^3\text{s}^{-1}$, some

ten times below the natural flood release amount (Bruwer, Poultney & Nyathi 1996). A further complication was that the period of the release required to fill the pans was therefore significantly longer than the natural 36-hour period, sometimes as long as 90 days (Bruwer & Jordaan 1994). The vast alteration in the natural flood regime had significant consequences for the people living downstream of the dam. A lack of efficient communication meant that people were not aware of flood release times, and subsistence crops and grazing land were inundated, sometimes for long periods. The *Cynodon* meadows and fever trees around the pans began to die off, and people's access to cultivated fields was severely curtailed (Bruwer & Jordaan 1994). The prevailing culture of social and environmental interdependence was significantly undermined, and a more individualistic social regime began to prevail. Severe drought in the area also had deleterious effects on both the social structure and the environment.

In 1984, the cyclone Domoina struck early in February, filling the dam almost to capacity. The pans and floodplain were inundated almost to natural levels. The first crops in three years were ready for harvesting, which could have taken place had DWAF not taken a decision to release $1450\text{m}^3\text{s}^{-1}$ (Bruwer & Jordaan 1994) in fear of a further cyclone overflowing the dam. Thus the first harvest in three years was destroyed with again, no communication with the people living on the floodplain. Clearly, this situation was untenable and led to the establishment by residents of the floodplain of a communication structure.

Bruwer and Jordaan's (1994) report explains the formation and structure of the first community participation in the flood release regime in the form of Water Committees, which were first elected by the community in 1988. The Committees each comprised five members who represented the interests of agriculture, stockholders, fishermen, domestic water and community health services. Originally, eight committees were established, from eight tribal regions, with the approval of the Tribal Authorities and support from DWAF. Local development initiatives such as the Mboza Village project provided logistical support (transport and infrastructure). The first years of flood release negotiation with the Water Committees were so successful as to lead to the formation of seven further committees.

The presence of the Pongolapoort Dam, therefore, adds to the complexity of the issues that require consideration in a management agreement between South Africa and Moçambique for the Pongolo / Rio Maputo, in that any agreement must incorporate the principles of floodplain management.

3.5. FLOODPLAIN MANAGEMENT PRINCIPLES

The situation on the Pongolo River floodplain is mirrored in many areas around the world, where a large dam has been built, changing the social and environmental characteristics of the area below the dam. Consequently, studying general principles of programmes for the management of these areas in other parts of the world, can inform the development of a floodplain management structure for the Pongolo floodplain.

A prominent and recent example of successful floodplain management on a river system similar to this one, is that produced by the World Conservation Union (IUCN) Regional Office for West Africa, through the Sahelian Wetlands Expert Group (SAWEG), a set of guidelines and a manual for multi-stakeholder management of floodplains on West African rivers. SAWEG is a multi-disciplinary group of hydrologists, ecologists, sociologists, legal experts and many others, who have studied the rivers of the Sahel in West Africa, including the Senegal, the Niger and the Logone Rivers.

The following is a brief outline of the guidelines produced by the SAWEG group after four years of study in the area (Box 3.1).

Box 3.1: Outline of SAWEG Floodplain Management Guidelines (IUCN 2001)

- **Planning** - bringing together stakeholders to formulate management and development options, and decision-making.
- **Implementation** – formalising the principles and guidelines for implementation of stakeholder management decisions.
- **Awareness building, institution strengthening and training** – generating awareness of floodplain management principles in stakeholders, and strengthening institutional capacity through training and education programmes.
- **Financing of floodplain development** – formulating a financial strategy to present to both foreign and domestic sources, and the private sector.
- **Policy (using 1996 Ramsar Guidelines)** – floodplain management policy must be formalised within the management structure.

According to the IUCN Press Release on 16th November 2001:

“The projects in the Diawling [Mauritania] and Waza Logone [northern Cameroon] areas were started after a dam and droughts reduced river flows so that the downstream fisheries and grazing grounds were destroyed. Both projects have successfully introduced artificial flooding from the dams. The restored floodplains now again provide livelihoods to the local communities of herders, fishers and farmers, whilst the large-scale irrigation schemes still receive sufficient water.”

Given the similarity of this area to the area of study, the current floodplain management system was evaluated according to assessments described in these guidelines.

3.6. CONCLUSION

This area of the Pongolo / Maputo basin, therefore, represents an area that is relatively unstressed as regards population and water use. The ecological damage to the floodplain and the general lack of water supply to the population, are partly as a result of lack of effective management objectives, but not as a result of lack of available water. The inhabitants of the area, in both Moçambique and South Africa have had a relatively long informal cross-border relationship, and transboundary malaria-control and economic development programs already exist formally in the area. Furthermore, there is a tradition of public participation in water management in the area, which, can be built upon to inform its development in other basins. The ecological importance of the area (on both sides of the border) has been established, and the fertile nature and natural beauty of the area present both tourism and agricultural opportunities, both of which are dependent on effective water management. Therefore, given the currently “unstressed” status of this watercourse, it represents a very significant opportunity to institute a water-sharing regime incorporating current thinking on transboundary water management. The following chapter will examine current thinking in transboundary water resource management, and the legal provisions which regulate it.

CHAPTER 4: LITERATURE REVIEW

4.1. INTRODUCTION

“Freshwater resources around the world have been overused, polluted, fought over and squandered, with little regard for the human and ecological consequences” (Erlach & Erlach 1998 *in* Gleick 1998:ix). This profligacy with the essential element of life has resulted in a world in which over two billion people are suffering from “water stress”, that is, their economic and social development is limited by lack of access to fresh water (Kuylenstierna & Najlis 1998). The essential conclusion of the Comprehensive Assessment of the Freshwater Resources of the World, conducted by the UN Commission on Sustainable Development is that current use of water is unsustainable (Kuylenstierna & Najlis 1998).

Water does not respect political boundaries, and given that almost 50% of the land on earth falls within transboundary basins, sustainable use of water is a considerable challenge in a world of disparate cultures, conflicting ideologies and ever-growing demand (Dowdeswell 1998).

4.2. SUSTAINABLE USE OF WATER

It is here that the “world’s disparate cultures” to which Dowdeswell (1998:13) refers, play a significant role in what is likely to be a defining factor in human development in the twenty-first century: sustainable use of the earth’s water resources. Gleick (1998:574) defines the sustainable use of water as

“the use of water that supports the ability of human society to endure and flourish into the indefinite future without undermining the integrity of the hydrological cycle or the ecological systems that depend on it”

However, the layers of complexity that underpin that definition can be found in the diversity of “human society”, which is divided by political, social, cultural and economic boundaries. Consistent reinforcement of those boundaries, throughout human history has led to the situation that exists in today’s world, where water is a strategic necessity to the state. This in turn, has led states to claim sovereignty over the water resources within their borders, in essence, dividing up water in a contiguous natural river or lake. International basins, therefore, must be seen “in a broader perspective” (GCI 1999:5).

Modern life continues to place increasing stress on global water resources, through rapid population increases and global inequalities in water policy. In the light of a need for a broader perspective, it is therefore important to define clear criteria, based on the broad principles of sustainability and equity to inform both national water policy and approaches to international or transboundary agreements regarding the use and allocation of water from international basins.

Dowdeswell (1998) and Gliick (1998) set out criteria for sustainable water use, which have been integrated in Box 4.1.

Box 4.1: Criteria for sustainable water use

- Basic water requirements must be guaranteed to all people to maintain human health;
 - a) Safe drinking water must be made available to all,
 - b) A fair share of water and water-based services must be made available to the poor,
 - c) A fair share of water must be made available to women, children and future generations,
 - A basic water requirement must be guaranteed to restore and maintain the health of ecosystems
 - Water quality must be maintained to meet certain minimum standards. These standards will vary depending on location and how the water is to be used
 - Human actions must not impair the long-term renewability of freshwater stocks and flows
 - Data on water resources availability, use and quality must be collected and made available to all parties
 - Institutional mechanisms must be set up to prevent and resolve conflicts over water
 - Water planning and decision-making must be democratic, ensuring representation of all affected parties and fostering direct participation of affected interests
 - Water policy must have international perspectives with regard to transboundary river basins, promoting a fair share among competing users

These criteria represent an approach to water use and allocation that is far removed from the “sovereign use” principles that dominated water policy at the turn of the twentieth century, principles which have given rise to the fundamental juxtaposition in the widely-used expression: “conflict over shared water resources”.

4.3. CONFLICT, POWER AND NATIONAL SOVEREIGNTY: THE 'THEIRS AND OURS' MENTALITY (GCI 1999)

i) Water and conflict

The prevalent theme through Dowdeswell (1998) and Gleick's (1998) sustainable water use criteria is that humanity must begin to believe in and implement, the concept of 'fair share' of water across boundaries in global water management policy and legislation. Historically, however, international river basins have been characterised by conflict. Gleick (1998) identifies four major links between water and conflict: water used as a political and military goal, water as a weapon, water as a target and conflict over water inequities in distribution, use and development. A look at Gleick's (1998) chronology of conflict over water illustrates the ingrained nature of conflict over water in human history. From 2500 BC, when water was used as a strategic weapon and as a target in the dispute between the cities of Lagash and Umma in the area now known as the Middle East, to the ongoing dispute, which began in 1947, over inequity of use and distribution of the Ganges Basin between India and Bangladesh, to United States / Kuwait / Iraq water conflict during the Gulf War, water and conflict have been inextricably intertwined (Box 4.2).

Box 4.2: Water and the Gulf War

During Iraq's retreat from Kuwait, desalination plants, on which the 'desert' country relies for a significant part of its water supply, were all but destroyed. Seven years later, it was discovered that oil contamination from the release of 60 million barrels of oil in the desert has contaminated an aquifer which supplies 40% of the country's fresh water.

The consequences of water as a tool and a target during conflict are reflected in the death of 500000 Iraqi children since the Gulf War. Denis Halliday (*in Sadler 2001*), a former assistant Secretary-General of the UN, makes this claim on the basis that as a result of the targeting of Iraq's vulnerable water supply and purification capability, the country has been unable to supply fresh water to its people because of contamination during the 1991 Gulf War.

Though there is disagreement as to the motivation for targeting Iraq's water supply during the Gulf War, there are none as to the fact that it was targeted, once again highlighting the strategic nature of water resources.

Given the dire consequences of water and conflict, the impacts on the water resources of this region if "the Unfinished War" is resumed are likely to be catastrophic in human and ecological terms.

Water, therefore, is a strategic tool in conflicts motivated by issues other than water. However, in conflicts specifically related to water, one of the principal drivers is the concept of state sovereignty, and sovereignty over water. Often, the exercise of national sovereignty is the exercise of political or economic power, and certainly in the early development of sovereignty and international law, the similarities are easily observed.

ii) **Sovereignty**

Throughout human history, nations, cities and states have controlled, allocated, manipulated and altered the flow and characteristics of the water resources within their borders. Water use, development, distribution and allocation have primarily been seen as the role of the state. However, the true illustration of the national sovereignty of a state is that they are able to enter into international agreements. Sovereignty therefore, implies international cooperation (GCI 1999). However, the strategic value and scarcity of water resources have often engendered conflict rather than cooperation between states. The fundamental importance of water to all aspects of human life, economic development and state power, have resulted in states protecting their "rights" to water as aggressively as they protect their borders. Any discussion of "rights", however, also necessitates a discussion of responsibilities and obligations conferred by the possession of rights, not least, those related to water.

a) ***The "all or nothing approach"***

In the late nineteenth century, until the late 1950s, water conflicts between co-riparian nations were characterized by what Mohammed-Katerere (2001:42) calls, "the all-or-nothing approach". Upstream nations tended to support (vociferously) the principle of absolute territorial sovereignty, or the right of a sovereign nation to appropriate any resource that falls within their territory. In 1895, following claims by Mexican farmers against the US for their abstractions from the Rio Grande for US agriculture, US Attorney-General Harmon stated that a recognition of those claims would be "entirely inconsistent with the sovereignty of the United States over its national domain" (Harmon 1895 *in* Bourne 1996). This has become known as "The Harmon Doctrine" and Bourne (1996:15) points out that "even today, it is doubtful whether the doctrine has been abandoned by the United States", and that other countries such as India (Indus River 1947) and Austria have used it in water disputes.

Downstream nations tended toward the principle of absolute territorial integrity, in essence "the right of veto in respect of any upstream development which may negatively affect the natural flow" (Quinn

& Kemp 2000:1). Some downstream nations continue to advocate this principle, but “it is also giving way to reinterpretation” (GCI 1999:14).

Both of these concepts are seen as impracticable in that they are essentially mutually exclusive, and offer no common ground. Clearly, given that “it is argued that the paradigm of a world order based on the principle of the inviolability of state sovereignty is shifting with increased globalisation” (GCI 1999:14), and that the use of international water resources cannot be mutually exclusive, other interpretations are essential.

b) The “No-harm” principle and equitable utilisation

In the latter part of the twentieth century, both of these approaches have been largely rejected, and a shift toward the principle of equitable utilisation has occurred in international law regarding the use of shared watercourses. The Lac Lannoux arbitration between France and Spain in 1957 supported this principle in that it asserted that sovereignty must be qualified by a responsibility not to cause damage to other riparian nations (Bourne 1996). This does, however, reinforce the notion that unrestricted utilization of a water resource can continue as long as it does not cause harm, which describes the principle of limited territorial sovereignty and integrity. This implies, however, that riparian nations would have the same view of what constitutes harm. Clearly, this is unlikely to be the case. The early exercise of national sovereignty in international law was often an exercise of a state’s political, economic or military power. The principle of equitable utilisation, therefore, required specific legal instruments to promote its application. These first emerged, as regards international water law, in the Helsinki Rules, formulated by the International Law Association in 1966.

4.4. THE DEVELOPMENT OF INTERNATIONAL WATER LAW

The Helsinki Rules set out factors that should be applied in determining what constitutes equitable utilization of shared water resources. Given the multifaceted nature of water resources, it is not insignificant that refining of these rules into an agreed United Nations Convention, took 25 years.

i) The United Nations Convention on the Law of the Non-navigational Uses of International Watercourses (The UN Convention)

The UN General Assembly adopted the UN Convention in 1997. It represents the “codification” of the rules of customary international law as regards shared watercourses (McCaffrey undated). It established three critical principles in the use of shared watercourses. They are:

- The principle of equitable and reasonable utilisation according to a number of factors including social and environmental factors. The principle states that these must be considered on a case-by-case basis (Article 6)
- The principle of obligation not to cause significant harm (Article 7), which protects downstream users of the watercourse from upstream development or utilisation. This principle introduces the possibility of compensation in the event that serious harm is caused
- The principle of prior notification in the event of planned measures that may “have a significant adverse effect upon other watercourse states” (Article 12)

The UN Convention is not yet in force and therefore not legally binding, but South Africa and Moçambique have ratified it in their national laws.

The fact that the UN Convention has not been ratified by sufficient signatories is to a large extent, due to the argument that the factors to be considered in determining equitable and reasonable use are considered by many nations to be “a long list of vague parameters without any hint as to how to combine them” (Elmusa 1998:2). Elmusa (1998) further contends that this ambiguity, as well as the lack of prioritising of factors significantly diminishes their value as a practical tool, given the complexity of issues and actors as regards transboundary water agreements. The “significant harm” principle, although seemingly protecting the rights of downstream nations, does not take into account harm that may be caused by denial of new uses. A more powerful co-riparian may therefore be able to use the “significant harm” principle to prevent a weaker co-riparian from instituting development plans on the watercourse (Elmusa 1998). As long as the principles of equitable use and significant harm are left to the interpretation of the parties involved, the UN Convention perpetuates the current *status quo* in that economic and political power still define the use of international watercourses.

This critique of the UN Convention pervades much of the current thinking and writing about the UN Convention. As Glieck (1998:115) puts it: “international water law may simply be an inappropriate mechanism” for addressing transboundary water conflicts or disputes. There are, however, other instruments at regional level, in the Southern African Development Community (SADC), though they embody similar principles, and consequently repeat the acknowledged shortcomings of the UN Convention.

4.5. REGIONAL AGREEMENTS AND NATIONAL LAW

Approximately 70% of the rivers in the SADC region are transboundary systems (Figure 4.1). Initially, the SADC Environment and Land Sector (ELMS) oversaw water resources in the SADC region, but predictions of increasing water scarcity in the primarily arid or semi-arid countries in the region prompted SADC to establish a Water Sector Co-ordination Unit (WCSU) in 1996. This was in the wake of the regional agreement: The Protocol on Shared Watercourse Systems in the Southern African Development Community Region (The Protocol). The Protocol was signed and ratified in 1995, with sufficient ratifications to come into force. Moçambique, which, as a downstream nation, felt that the Protocol provided no protection for what Moçambique considered inequitable upstream use, and failed to protect the riparian ecosystem and estuary (Leestemaker 2000). Moçambique initiated amendments to the Protocol in 1999 (Leestemaker 2000).



Figure 4.1: Transboundary river basins in Africa (Transboundary Freshwater Disputes Database 2002)

i) The SADC Protocol

Once again, the issue of sovereignty is the first to be addressed. Article 1 provides that SADC states are entitled to use water resources in their territory "without prejudice to their sovereign rights". Despite the "equitable use" and "significant harm" principles being applied, the approach of the Protocol is that of limited or qualified territorial sovereignty as opposed to co-governance and the recognition of the holistic nature of water and water resources. Therefore, the SADC Protocol provides for river basin management organisations in which states have a forum for negotiation and information sharing, rather than for strategic planning and decision making for the basin as a whole. Furthermore, the equitable use factors are listed without application criteria (Mohammed-Katerere 2001), but the Protocol does make provision for management institutions for shared watercourses, and sets out five components that limit use of international watercourses. They are as follows:

- Balancing development with conservation
- Inter-state co-operation
- Equitable sharing of water resources
- Developing compatible national systems
- Notification of emergencies

Essentially, as long as "territorial sovereignty" remains the primary concern in international water resource agreements, the principles of equitable use, information sharing and significant harm will remain theoretical, and dispute resolution requiring practical application of these principles will remain difficult to achieve. The Protocol's provisions for transboundary management institutions offer some opportunity, in that current understanding of effective transboundary management of shared watercourses is a more flexible view of the concept of sovereignty, in that interstate collaboration over regional resources "reinforces rather than diminishes the sovereignty of each state" (GCI 1999:5). This could carry through to newly established management institutions provided for in the SADC legal framework.

Regional agreements must be incorporated into national laws to be ratified, and the agreement is binding only if there are a sufficient number of ratifications by the signatories to the agreement. It is important, therefore, to examine the provisions of South African and Moçambican water law in the context of the role of the state, provisions for human needs and the environment, provisions for public participation in water allocation and management, and the meeting of international obligations.

ii) **National Water Law: Moçambique and South Africa**

With regard to national systems, national water laws in South Africa and Moçambique already have many similarities. In ratifying the SADC Protocol, both have provided for meeting international obligations. To give effect to meeting international obligations, the legal framework exists, therefore, in both the SADC Protocol and in the national legislation in South Africa and Moçambique. There is, however, a need for concurrence between the national and regional legal systems so that they embody similar principles. Also, transboundary management agreements or institutions need to be established to give effect to the provisions of national water laws.

Leestemaker (2000) compares some of the major principles of the national water laws of South Africa and Moçambique, as they pertain to water allocation, use and management of international river basins. The comparison is, by necessity, brief, but highlights the elements relevant to transboundary water resources (Table 4.1).

Table 4.1: Comparison of aspects of National Water Law in South Africa and Moçambique (Leestemaker 2000)

Legal Criteria	South Africa National Water Act 36 of 1998 (NWA) Department of Water Affairs and Forestry (DWAF)	Moçambique Water Act Lei no.16/91 (WA) Direcção Nacional de Aguas (DNA)
Role of State	State as trustee	State as owner
Riparian rights	No riparian rights	No riparian rights
Management unit (SADC Protocol – Watercourse)¹	Catchment ¹	River Basin ¹
Management implementation	State as enabling institution for implementation of management principles according to national criteria and NWA.	State institutions are responsible for implementation of management principles.

¹ Though these three terms refer to the same thing, there are differences in their definitions, which may lead to legal differences in a joint transboundary management system.

Legal Criteria	South Africa National Water Act 36 of 1998 (NWA) Department of Water Affairs and Forestry (DWAF)	Moçambique Water Act Lei no.16/91 (WA) Direcção Nacional de Aguas (DNA)
Public participation in catchment management	State devolves management responsibility to regional level through catchment management agencies and fora to ensure participation of interested parties	The WA includes local user organisations and local government as members in the DNA's Integrated Management Council at catchment level.
Water use	Sustainability and equity	Rational use – though no definition of what is rational, is provided (Leestemaker 2000).
Environmental allocation	Ecological Reserve	Environmental priority over private use and protection for environmental flows
Human needs	Basic human needs Reserve	Not provided for in the WA
International obligations	Respect for downstream allocation, optimal benefits for co-riparians	Management to benefit all states involved

Despite provisions in both national water acts, and the ratification of both the UN Convention and the SADC Protocol by both countries, “in practice, South Africa has failed to honour its responsibility to its downstream users” (Mohammed-Katerere 2001:52). As it is with most international watercourses, even those subject to water sharing agreements and regional protocols, the “ours” and “theirs” mentality prevails (GCI 1999).

To a large extent, this is as a result of not only the interpretation of national or external sovereignty, but also the internal sovereignty of states over their own water resources. Despite provisions for local user participation in water management decisions, they remain rhetorical and are not (yet) found in actual water management practice. The Green Cross International (1999) report on National Sovereignty and International Watercourses argues that a new interpretation of sovereignty is essential to sustainable transboundary water management, one in which shared watercourses are not subject to any state's exclusive rights, and that “it is the people...not the governments, of a

region which are the true holders of sovereignty over a water resource". To this end, it is essential that local users are party to the decisions made regarding water allocation, use and management in their area, and have the power to influence those decisions, and the will to implement them.

4.6. TRANSBOUNDARY WATER MANAGEMENT AGREEMENTS

Milich and Varady (1998), consider four paradigms or approaches, which have influenced the structure of the majority of such agreements across the globe.

- **The Technical / Scientific paradigm** – where an organisation is established to manage the basin (or a part of the basin), but engineers or hydrologists are selected to make and implement decisions, including those regarding the extent of public participation.
- **The Regulatory or Standard-driven paradigm** – based on environmental standards and pollution regulation. National standards, which may not apply in localised situations.
- **The Closed paradigm** – negotiated at the level of state-to-state, generally by high-level diplomats, to whom openness regarding a nation's resources is unacceptable.
- **The Top-down paradigm** – where states act according to signed international agreements and local actors are expected to implement them, with little power to make or change decisions.

Milich and Varady (1998) define five themes which emerge from these paradigms:

- Decision-making power remains centralised
- Decisions reflect power imbalances between states
- Implementation of the agreement is at the discretion of each state or signatory
- There is little opportunity and few mechanisms for meaningful public participation
- Agreements are "driven by development needs" (Milich & Varady 1998:Part 2: 3), ignoring social costs.

i) **An analysis of selected transboundary water agreements**

In order to determine the nature of current transboundary agreements, and the level of success they have achieved to date, in terms of sustainability and effective management of water resources, a selection of six agreements has been analysed in Table 4.3. These agreements which instituted basin management organisations represent a range of watercourses, political regimes and available resources of member states (Table 4.2). Three non-African organisations have been selected as representing examples of three different situations which made water management agreements

necessary, increased agricultural use, pollution and increasing demand in an arid area. Three management organisations have been selected from Africa but they represent different types of management styles.

Table 4.2: Institutional agreements selected for analysis

Management Organisation	River Basin	Rationale behind the selection of this organisation.
International Boundary and Water Commission (IBWC)	Rio Grande / Rio Bravo	This Treaty represents an agreement between an economically and politically powerful state (US) and a state that is economically poor and politically, fairly unstable until recently (Mexico). The provisions of this Treaty have not been altered since it was signed in 1944.
International Commission for the Protection of the Rhine (ICPR)	Rhine	This agreement gave rise to a management organisation which includes seven economically powerful states, is well resourced financially and has access to a high level of technical expertise.
Israel-Jordan Joint Water Commission (IJJWC)	Jordan	This organisation was selected because it was formed to manage a heavily stressed river basin in an arid area. The states involved in this agreement have historically been embroiled in both political and ideological conflict.
Okavango River Basin Commission (OKACOM)	Okavango	This organisation is the first of the three African organisations selected for analysis. It represents one of the few organisations that have actively engaged in public participation.
Zambezi River Authority (ZRA)	Zambezi	The selection of this organisation rather than The Zambezi River Action Plan (ZACPLAN), was to demonstrate the effect of an organisation which takes a highly sectoral view, in that it was formed for only one aspect of water sharing, namely hydropower.
Tripartite Permanent Technical Committee (TPTC) (Pre-Incomaputo agreement)	Incomati	This organisation was selected as it was formed to manage a basin just north of, but significantly more stressed than the Maputo basin. Since the Incomaputo agreement was signed, the Maputo basin now falls under the aegis of the TPTC, and as such, it was important to analyse the TPTC's operations on the Incomati basin.

Despite the existence of 300 water-sharing or transboundary water management treaties, the world's international river basins have degenerated, with rivers such as the Rio Grande and the Incomati even reportedly ceasing to flow in the dry season (Environmental News Service 2002; Leestemaker 2000). In order to determine what changes should be made in the approach to transboundary agreements, the selected agreements have been analysed to determine factors which have led to their lack of success in sustainable water management.

Each agreement is analysed according to the following themes. These themes have been determined according to the conceptual framework described in Chapter 2.

- Relative power (economic and political) of parties involved
- General approach
- Representation of communities/ local users (left to state or in agreement)
- Extent of public participation in formulation of agreement
- Public participation in agreement implementation
- Provision for environmental needs
- Management focus: Allocation, management, and development
- Management style
- Monitoring: quantity, quality, supply, and allocation
- Regulation and enforcement of provisions of agreement
- Current projects in the basin with transboundary water management effects
- Member perceptions of allocation equity
- Conflicts and disputes
- Extent of marginalised users
- Effect on state and local user relations
- Comment

Following the analysis, issues which emerge as having affected the sustainability of the watercourse and the effectiveness of the agreement in terms of water resource management have been determined in order to assess changes which are necessary in the formulation of transboundary agreements in moving toward sustainable management of water resources.

Table 4.3: Analysis of selected Transboundary River Basin Agreements (Footnotes located at Page 67)

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Basin states	US and Mexico	Switzerland, Germany, France, Luxembourg, Liechtenstein, Austria, The Netherlands	Israel, Jordan, Syria, Lebanon and Palestine	Angola, Namibia, Botswana	Angola, Botswana, Malawi, Namibia, Tanzania, Moçambique, Zambia and Zimbabwe	South Africa, Swaziland, Moçambique
International, regional agreements, other basin agreements (Signed and ratified)	UN Convention (1997), North American Free Trade Agreement (NAFTA) (1994), which established the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank) ¹	UN Convention (1997), Commission of the Rhine against Pollution (Bern Convention) (1963), Rhine Action Plan against chemical Pollution (1987), Action Plan on flood defence (1998) ² , EU Water Directive ³	Revised Unified Plan, (Unsigned Treaty) (1955), Israeli-Palestinian Interim Agreement (West Bank and Gaza Strip) (1995) ⁴	SADC Protocol (1995 Revised 2000) ⁵	SADC Protocol (1995 Revised 2000), Zambezi River Action Plan (ZACPLAN) (1987) ⁵	UN Convention (1997)(SA only) SADC Protocol (1995), Joint Water Commission (SA-Swaziland), Sabi River Agreement (SA-Moçambique) ⁵ Komati Basin Water Authority (South Africa and Swaziland) (1992) ⁶
Institutional Agreement	International Boundary and Water Commission (IBWC)	International Commission for the Protection of the Rhine (ICPR)	Israel-Jordan Joint Water Commission (IJJWC)	Okavango River Basin Commission (OKACOM)	Zambezi River Authority (ZRA)	Tripartite Permanent Technical Committee (TPTC)
States involved in agreement	US and Mexico	Switzerland, France, Luxembourg, Germany, The Netherlands	Israel and Jordan	Angola, Botswana and Namibia	Zambia and Zimbabwe	South Africa, Swaziland and Moçambique
Date of agreement	1944	1950	1994	1994	1987	1993
Legal Basis for agreement	National Acts, UN Convention, NAFTA ¹	UN Convention, EU Regulations, national acts	The Washington Declaration (Peace Treaty) ¹	SADC Protocol, national acts ⁵	National acts at time of formulation ⁵	SADC Protocol, national acts
Background	In 1944, once again at a high level of government, the US and Mexico signed a treaty which, among other provisions, was to regulate the Rio Grande "in order to obtain the most complete and satisfactory utilisation thereof". ^{7:1}	As a result of high levels of pollution from significant industrial use, and flooding from increasing development along the river, the Netherlands instigated the negotiation process. Decisions of this agreement are not legally binding ²	Formulated as annexure to the 1994 Peace Treaty between Jordan and Israel. It concerns not only the Jordan basin, but also the Yarmouk basin and the Araba / Arava groundwater aquifer ¹	Formulated as a result of increasing demand in Namibia and Angola, coupled with the ecological importance of the Okavango Delta and its significance for Botswana ⁸	Formulated at dissolution of Central African Power Corporation (CAPCO), mainly for maintenance of Kariba and to assess other opportunities for power generation ⁹	The TPTC was created between South Africa, Moçambique and Swaziland. Ostensibly, the organisation was to address issues relating to the Incomati, Limpopo and Maputo basins. ¹⁰ However, it has been associated primarily with the Incomati basin ⁵ (until the Incomaputo agreement was signed in August 2002)

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Relative power (economic & political) of parties involved	Despite the obvious differences in economic and political power, Mexico is the upstream state (Rio Bravo) and the guarantees a minimum flow to the US according to the 1944 Treaty. In May 2002, conflict has arisen as a result of lack of drought planning, which has resulted in a significant 'water debt' owed to the US ^{11: 1}	Similar, and EU is officially a signatory ²	Israel is militarily the most powerful state in the basin, and is also the upstream user – effectively controls the basin ¹	Lack of infrastructure in Namibia and Angola, and relative stability in Botswana highlight some inequalities. ⁵ A plan to pipe water into Windhoek resulted in Botswana turning to NGOs to highlight the Okavango Delta through rallying civil society by forming the Okavango Liaison Group, which includes tourism associations, NGOs and Botswana University representatives. ¹⁰ This demonstrates a somewhat more subtle use of power than South Africa has demonstrated on the Incomati	Zimbabwe owns most infrastructure, most functions carried out by Zimbabwe. Only 10% of employees in the ZRA are Zambian ⁹	South Africa is by far the most powerful user, and the upstream state. Significant agricultural development in South Africa has resulted in a high population density, and large-scale irrigation infrastructure established in the apartheid era for white sugar farmers and commercial forestry. Despite negotiated minimum flows, Mozambique has claimed that South Africa farmers have stored water from the Incomati in dry years, and at times, the river has stopped flowing ¹²
General approach	High-level government, technical, standard-driven ¹	State-level agreement, standard-driven except on short-term projects ²	Highly technical, very high-level government, water issues intertwined with larger political issues ¹³	Collaborative process in management and implementation, not in formulation ⁵	Agreed at high government level (top-down, deeply intertwined with political rather than water management matters ⁹	Agreed at a high level by government officials. Minimum flow guaranteed into Mozambique is 2m ³ s ⁻¹ , which was agreed in 1991 in Piggs Peak, Swaziland ¹⁴
Representation of communities/ local users (left to state or in agreement)	Left to state – though again, the proposed sustainable management plan offers possibilities	Left to state – working and project groups are comprised of experts and state officials. Above that, co-ordination group is responsible for decisions. This year, 'observer status' to the Plenary sessions has been granted to several NGOs including Greenpeace and WWF. ¹⁵	Left to state – given the prevailing political frameworks, and the Palestinian Crisis, with its attendant effects on state relations, this is very unlikely to change in the near future	Left to state – stakeholder representation through regional steering committees. The Environmental NGOs have increased the level of community involvement but mostly in Botswana	Left to state – agreement concerns mainly strategic power requirements. The ZRA deals less with water allocation as maintains water development infrastructure and initiates projects to extend development ⁵	Left to state – no community, representation in any of the processes of the TPTC, which seems largely ineffectual given that Mozambique has threatened litigation in the International Court of Justice, and the environmental state of the Incomati river is critical at best ¹⁶
Extent of public participation (PP) in formulation of agreement	None – state level	Very little – high industrial use. State actors prioritised state and business interests	None – security issues and secrecy severely limit information flows	None – state level	None	None

	NORTH AMERICA		EUROPE		MIDDLE EAST		AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati			
PP in agreement implementation	None – very technical, state and experts, but proposed bi-national summit offers some possibilities	None – state and experts	None – security issues and secrecy prevail	Relatively good – through Environmental Impact Assessment and Transboundary Diagnostic Analysis ⁵	None – state employees	None – state representatives			
Provision for environmental needs	Very little, especially given that the Rio Grande stopped flowing as a result of critically low flows. ¹⁷ There is a concentration on agricultural use and water allocation to states, not environmental requirements, though the proposed 'sustainable management' plan is yet to materialise	Relatively high, but more from a pollution perspective. The Rhine is distinguished in this review by being a navigable river with a high level of industry in the basin. Recently, however, the ecosystem perspective is being supported in the Plenary sessions by environmental NGOs; included as observers since the 1999 Convention on the Protection of the Rhine ¹⁸	Very little, as the agreement is focused on water allocation, and not overall environmental management. The Sea of Galilee is at its lowest level in 60 years, and upstream abstraction from Israel and in Jordan from the East Ghor Canal often leaves flows critically low ¹³	Relatively good, but Angola's political problems have kept her out of many of the processes of OKACOM, a situation which may test the provisions of the agreement as the country pays more attention to social and economic development than the civil war has previously allowed	None - the focus of this agreement is not water management, but rather hydropower	None – the focus of this agreement was primarily allocation for both agricultural use in South Africa and Swaziland and to appease Moçambique with a minimum flow. It perpetuates existing uses, which have proved unsustainable at current rates of use, while stunting the development opportunities of Moçambique			
Management focus: <ul style="list-style-type: none"> • Allocation • Management • Development 	All – the recent NAFTA agreement gave rise to NADBank, which has opened funding for conservation initiatives and hydropower infrastructure. The population of the basin is approximately 12 million, with urban, industrial and agricultural uses across the spectrum ¹⁹	All – the problem is that the organisation attempts to standardise management across diverse countries, uses and geographic characteristics. The very high industrial use of the river, coupled with pollution accidents, and the non-legally binding standards set, has resulted in "objectives for water quality and emissions in conflict" ²⁰ : 1	Primarily allocation – these are very arid areas, and Jordan was experiencing extreme water stress. Water issues were very high on the agenda of the Peace Treaty negotiations. Some management functions in terms of quality regulations in the agreement ¹	All – environmental assessment is included, regional steering committees for technical processes, currently undertaking an Integrated Basin Management Plan – funded through Global Environment Facility & IUCN ⁵	Development – mainly regarding hydropower (Kariba Dam), conflict resolution mechanisms included (unsuccessful)	Unclear – the TPTC is intended to address allocation, development and conflicts on the Limpopo, Incomati and Maputo Rivers, but even the name 'Technical Committee' denotes inadequacies in management focus			

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Management style	Traditionally, management has been top-down and regulatory through the 1944 Treaty. A high-level government meeting in July 2002 has proposed a summit to include water users and experts, to fund water conservation initiatives and improve hydropower infrastructure. The task of the summit will be to propose a "binational sustainable management plan" ^{19: 2}	Highly technical, standard driven. Coordination group made up of experts and senior national officials make up three permanent groups (quality, ecology and emissions) and two project groups (sustainable development and flood defence)	Highly technical. All measures are generally volumetric, little effective co-operation and collaboration in management of the basin. Given the political strife in the area, openness and communication are ineffective, and disputes frequent	Relatively collaborative through regional committees and through the draft Transboundary Diagnostic Assessment (baseline data) ⁵	Commercial, political (at a high level). Essentially, the ZRA has had little to do with water management on the Zambezi. It has instead served to highlight conflict areas between the two member nations. "Hydro-political issues and differences are intimately woven into the fabric of the two states' bilateral actions" ^{9: 36}	Many sources on the TPTC cite is as not having been effective ^{10:9,5} . This has essentially resulted in the Incomati being seriously over-utilised within South Africa, to the point that salinity of the lower reaches is beginning to have an economic impact ¹⁴
Monitoring: quantity, quality, supply, and allocation	Again, the ongoing conflict and critical environmental state of the river (to the point that it is dry at the mouth), indicates ineffective monitoring	Highly standard-driven management. Difficult to set and maintain rigorous standards across such diverse uses and population densities	The political conditions are not conducive to a free flow of information, which exacerbates conflict and makes monitoring all but impossible	Monitoring is ineffective at the moment, but current plans should improve. The agreement "provides a useful framework for collaboration" ^{15:49}	None – no real management objectives and internal political woes	Weak – the critical ecological state of the river illustrates clearly the lack of effective monitoring
Regulation and enforcement of provisions of agreement	Despite the presence of experts, the significant 'water debt' owed by Mexico according to the 1944 Treaty indicates Treaty's provisions are ineffectively regulated	Recent inclusion of NGOs suggests a need for improvement of ecological management, but it is acknowledged by this move as opposed to ignored	Once again, the lack of information flows, and ongoing conflict in the region makes regulation of the provisions of this Treaty very difficult. Water issues are not separated from other areas of conflict ¹³	To date, there has been little enforcement, but the low population density of the river and lack of industrial use and water infrastructure has assisted	Weak – political upheaval, capacity problems	Weak – this agreement has proved to be largely ineffective in terms of sustainable water management – a function of the inequality under which it was formed
Current projects in the basin with transboundary water management effects	The Border Environment Cooperation Commission (BECC), established as a side agreement to NAFTA with a social-environmental focus. However, 1944 Treaty and IWBC remains in force ¹	Proposed 'twinning' of river management organisations in member countries where solutions cannot apply for the whole basin, under a River Authority with executive powers ³	None	'Every River' Project, attempting to balance local user needs in Namibia, Botswana and Angola from a social, economic and environmental perspective ²¹	ZACPLAN projects (SADCWCSU)	Shared Rivers Initiative (2000) – involving experts and multidisciplinary task teams from all three countries, but no public participation ¹⁶

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Member perceptions of allocation equity	Conflict has been fairly consistent since the 1944 Treaty, but recent drought in Mexico has exacerbated the problem, with Texan farmers accusing Mexico of "hoarding water" ^{22:1}	Though it is not stated explicitly in the referenced reports, there is an underlying current that the pollution issue is far from resolved within the ICPR	The bilateral nature of the Treaty excludes other riparians. Palestine's perceptions of inequity are well known	Possibility that Namibia will seek litigation in the International Court of Justice over its (currently postponed) plans for a pipeline to Windhoek, which Botswana opposes. Angola's involvement has been hampered by its political problems	Zambian news reports have criticised the ZRA for an imbalance in infrastructure development favouring Zimbabwe. Zambia, has vetoed on the Batoka Gorge project, apparently hindering Zimbabwe's ability to address domestic power needs ^{9: 39}	Moçambique's perception of inequality is so marked that it has threatened to take South Africa to the International Court of Justice over this issue, but to date it has not done so ¹²
Conflicts and disputes	Many – as documented though this column, conflict across the border has been fairly consistent since the Treaty was signed in 1944. As recently as 2002, US President George Bush had an urgent meeting with Mexico's President Fox over water issues in this basin ¹⁷	The major driver of disputes on the Rhine is pollution. The 50-year old ICPR is inadequate in that it attempts to provide technical solutions to these problems from a basin-wide perspective, which often conflicts with internal systems in member countries	The Jordan river basin has generated fairly consistent conflict since the Arab Headwater Diversion Project in 1965 was attacked by Israeli artillery. ¹ The IJJWC does not have as much conflict and dispute resolution mechanisms, as it has two Water Commissioners "doing their best to minimise any threat of a new political crisis over water" ^{11:Part 1:4}	War in Angola and lack of development in Namibia, has resulted in less conflict on the Okavango than other major rivers. Increased demand in Namibia has resulted in increased abstraction from the Okavango. The plan to pipe to Windhoek raised a storm of protest, and the possibility of international litigation over water issues. OKACOM has not the mechanisms to deal with such disputes, and despite its environmental focus, needs adjustment for issues such as this, as well as increasing water requirements in Angola	Many – Batoka Gorge project (power), division of assets of CAPCO (original company). Resolution mechanisms within the ZRA have not been applied as a result of the linking of water security and political relations. Political solutions rather than use of ZRA mechanisms	The TPTC has not been successful in dispute resolution on the Incomati. Despite minimum flow requirements into Moçambique, developments on the South African side of the border, such as the Injaka Dam and the weir at Ressano Garcia / Komatipoort have reduced flow below minimum. ¹⁴ The lack of dispute resolution mechanisms in the TPTC is illustrated by the Moçambique threat of international litigation over this problem

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Extent of marginalised users	Many Mexican farmers are subsistence farmers, and drought has forced them to change to dryland crops. ¹¹ The inequalities in the economic power of these farmers (as opposed to Texan large-scale farmers) could affect their representation in the 'joint sustainable management plan', if it is instituted	Difficult to assess, given the basin population of 50 million people	The complete lack of public participation in any part of this agreement as well as the prevailing political volatility in the region have marginalized most users of this basin. Its strategic importance has focussed management practice on security, not community	NGO activity has promoted the users of Botswana communities, and the war in Angola has largely kept the focus off integrated water management, but given the condition of the rural poor in Africa generally, it is likely that most users of the Okavango basin are unrepresented	Agreement at level of state only marginalizes all local users and politicises water use and allocation	Moçambique users are highly marginalized. The 20000 islanders on Ilha Josina Machel, illustrate this. As a result of controlled releases by the Incomati Sugar company. The lower part of the island is flooded when planting usually takes place, and the upper part is too dry to grow the staple maize ¹⁴
Effect on state and local user relations	State relations are significantly friendlier than those between border communities, which are described as acrimonious to the point that 'Texas politicians are threatening retaliation over Mexico's failure to live up to its obligations under the 1944 Treaty' ^{11:1}	State relations are genial, but the recent decision to involve NGOs in Plenary sessions and the idea that organisations in separate states should have a local focus and then be 'twinned' with other states under a River Authority highlights other necessities	Ongoing conflict between Israel and the Arab states has included water issues even if they were not causal. Water conflicts between Arab states in the highly arid region are also not unusual. The nature of state relations precludes local user involvement	State relations are under pressure from Namibia's threat of international litigation. The Okavango Liaison Committee is separated from the OKACOM process and could create potential conflict	ZRA has exacerbated conflict, rather than assisted in resolving it. Inequalities at the time of its formulation are perpetuated. Conflicts with upstream or downstream countries are not provided for at all,	Relations since the 1994 elections in SA and Moçambique have been relatively good. The threat of international litigation has not been carried out, but there remains a good deal of discord between Moçambiquan communities and local users in SA
Comment	Technical measures, especially those that were formulated over 50 years ago are appallingly inadequate to deal with the levels of complexity in current transboundary water management. Local user involvement is essential in determining fair allocation	The ICPR has a long history of technical cooperation in a fairly stable political system, but this has not resulted in a sustainable river basin. Technical measures and good-neighbourliness are simply not sufficient criteria for successful transboundary management	The technical cooperation between Israel and Jordan in the IJJWC, despite having been unsuccessful in terms of basin management, does represent the possibility that two states, usually in enmity, can cooperate	Potential conflicts resulting from unplanned abstraction in Angola and development in Namibia will put pressure on OKACOM. The agreement highlights "the need to redress the respective rights of state and citizens" ^{5:51}	The ZRA is an example of what not to do in transboundary water agreements. ⁵ It has consistently spawned conflict rather than provided a mechanism for either avoiding or resolving it. A highly sectoral view does not make for successful agreements	South Africa continues to enjoy the benefits of the upstream Incomati, while Moçambique must pay the costs of lack of development. The perpetuation of existing use as a cost to potential uses must be addressed in transboundary agreements

ii) **What, therefore, must change in transboundary water agreements?**

Table 4.3 examines a range of transboundary agreements, formulated over the last 50 years around the world, in both developed and developing countries, on industrial rivers and rivers which primarily flow through rural or sparsely populated areas, through powerful or poor nations. None of these agreements have led to a sustainable management system. So what can be learned?

- **Provide for a review period of the terms of a transboundary agreement**

Throughout the consistent conflict that the US-Mexico agreement in the Rio Grande / Rio Bravo basin has generated, the 1944 Treaty's volumetric allocations are referred to. Essentially, given current knowledge of water management, the only reference that should be made to measures defined in 1944, should be that they require renegotiation. This suggests that transboundary water management agreements should, at least, provide for regular review of the terms of the agreement, to ensure that the management system is flexible and can take into account external shocks, such as drought (increasingly important in a warming world), population increases, and changing uses of the basin. The use of "experts" to determine allocation based on a volumetric measurement, without consultation of the users of the water has resulted in a dry Rio Grande after a number of years of drought, and increasing vitriolic antagonism between "competing" users.

- **Transboundary water agreements are ineffective if only state concerns are taken into account**

This was most eloquently expressed by Sills (1998:2) at the Washington Conference on Water, Dispute Prevention and Development:

"One is reminded of the old comparison between diplomats making international agreements and elephants [copulating]: contact takes place at a high level, a lot of dust is kicked up, and it takes years to produce results"

These agreements remove decision-making power from local actors, which decreases the efficacy of their implementation. Given that the driving factor for decisions is often the economic or political power of one co-riparian over another, the sustainability of the agreement and the basin is put at risk rather than protected, and the possibility of conflict over water resources between co-riparians often is increased. There is another side to state-level agreements, which is especially important in Africa: the complicated proliferation of traditional and tribal resource rights could be extinguished by a transboundary agreement at state level (Mohammed-Katerere 2001), and further increase the

resource tenure insecurity that the democratically elected government is attempting to redress at a national level.

- **Create new 'experts'**

A look at the ICPR, on the Rhine basin shows even a well-funded, well-established management organisation in countries with democratic political systems and generally good governance, staffed with a plethora of experts in engineering, hydrology and chemistry have been unable to find a solution or even to slow the trend of the basin's rampant pollution. On the Rio Grande, once again an organisation staffed with water 'experts' of many disciplines, little effect can be seen in real terms. In Africa, with increased population and development especially along life-giving river basins, quality standards and volumetric flow requirements cannot possibly be implemented and maintained by the acknowledged experts alone. Wolf (2000) gives an idea of indigenous expertise as regards water. In Africa, rural people have had to manage their resources carefully, given the capriciousness of the natural world in which they have survived for centuries. Tapping that resource will address a number of problems:

- Lack of active local user involvement in transboundary agreements which often increases local users insecurity around resource use, and leads to unplanned abstraction from rivers at a local scale.
- Implementation and monitoring at a central level is often difficult in areas with few roads, and which are often difficult to reach, increasing the costs of centralised implementation of a transboundary agreement. Local "information specialists" who are actively involved could address this problem, making monitoring significantly less costly, and building capacity in local user populations at the same time.
- Lack of a genuine flow of information, one of the primary principles of the UN Convention. Local users monitoring and implementing agreements immediately improves information flow not only between states, but also between the state and its own citizens and between citizens from the member states in the agreement.

- **Different management objectives for different area typologies**

Again, looking at the ICPR, at the Second World Water Forum in 2000, the Rhine basin states agreed that it was impossible to apply one set of solutions to all the basin states. Instead it was proposed that management organisations in one member state were 'twinned' with organisations in another, all under a River Authority. In this sense, twinning can be described as applying the

resources, technical, intellectual and financial, of different basin management organisations within a basin to a more deeply co-operative approach to problems. It may involve separate legal agreements between organisations, but will certainly include activities such as: developing management systems, participation in workshops and mutual training of staff (NetCoast 2001). This goes some way toward, solving the problem, but perhaps management organisations for similar geophysical or social areas should be twinned (or one organisation for that area formed), rather than maintaining national boundaries.

- **Manage the environment, not just the water**

This is perhaps obvious, but most agreements provide for water management only, though there are often stipulations concerning environmental requirements. Once again, local land-use practice affects water resources as much as do upstream activities. The land and water environments cannot be separated, and transboundary agreements must reflect that interconnectedness. Assistance from environmental NGOs can provide input into the management organisation or authority for environmental management practice and principles to augment water management.

- **Do not perpetuate existing use at the cost of potential uses**

Not only does this create the potential for conflict between users and states, but existing use may already be unsustainable. In the case of the Incomati River, this is a major problem. Existing use, jealously guarded by a powerful upstream state has resulted in severe environmental impacts, which now threaten not only the river, but also state relations. Again, transboundary agreements must be flexible about what the best uses are, not the best uses given the existing uses, which does not support the UN Convention's "no use has inherent priority over existing use" clause (Mohammed-Katerere 2001).

- **Expect disputes and conflicts, and manage and prepare for them**

Every example of transboundary agreement has had, at various stages of its existence, to manage a dispute or a conflict between water uses. Often the problem is with the agreement itself, in that, in the ways outlined above, they often generate or exacerbate conflict. Generally, however, in large basins with many uses, and increasing populations, there is likely to be conflict and dispute over water. An agreement should, therefore, contain (agreed) dispute resolution and avoidance mechanisms which have been negotiated at all levels, not simply state to state. In this way, disputes are often resolved before they become conflicts. Should the situation escalate, as Wolf (2000)

proposes, an international arbitration body, again consisting of not only 'experts' (in the Western model) and politicians specifically for water disputes would be a less desperate solution than threats of international litigation.

- **Encompass a broad spectrum of issues and sectors**

Agreements such as the ZRA, which address one issue, such as hydropower, generally incite conflict. The world's river basins don't serve just one need; therefore agreements formulated to regulate one need assume that that need has priority. This is not sustainable. Where, as in the case of the Incomati, agreements "emphasize water development, rather than management, ... tensions around use may be exacerbated" (Mohammed-Katerere 2001:4).

- **Address power and political issues at the outset**

Governments, policies and economies change. Transboundary agreements which address issues of power inequalities, acknowledge that inequalities exist, and are flexible to changes in those relations at the outset, are more likely to achieve what they ostensibly set out to do: manage water resources. Such agreements are also more likely to be able to separate water from other political issues, which enhances, rather than detracts from both state security and state sovereignty.

- **Agreements should be transparent, and actors accountable**

These are two words often quoted with regard to governments and corporations, but in transboundary agreements, they are essential practices. An agreement which creates a river authority which is not transparent will engender suspicion in local users and other state actors, and information flows so critical to water management, will be incomplete or worse, misleading. The qualities of accountability and taking responsibility for carrying out the terms of the agreement, especially in the case of pollution, are vital to the long-term survival of the agreement, the watercourse, the environment and the human population who depend on them.

iii) **Conclusion**

This analysis has highlighted some of the complexities and the problems with current transboundary water resource management practice. Current legal frameworks, international, regional and local, do not adequately address those complexities. Given the necessity of water for human survival, international law does provide for a human rights framework in water management. Transboundary watercourses do not respect the boundaries man has placed across them, and as such, require a

new management focus if the sustainable use of the world's water resources is to be attempted, by the capricious human actors whose survival depends on it. Given the failure of international legal instruments to manage sustainably the world's transboundary water resources, there is

"an emerging theory which has already been embraced by many jurists and international lawyers ... that of common ownership of international watercourses. The idea that water flowing between two states is communally owned is based on and assumes full co-operation over such water" (GCI 1999:14).

It also assumes the human right to water is taken into account in its management, an assumption which is currently outside the legal framework governing the use of water resources, but finds support in the principles of customary law and in the UN Universal Declaration of Human Rights.

4.7. WATER AND HUMAN RIGHTS

Dowdeswell (1998) refers to our dependence on water. Implicit in that dependence is the understanding that access to water represents survival. Mohammed-Katerere (2001:44) contends, "rights to water can also be considered a derivative of the right to life". Article 25 of the Universal Declaration of Human Rights (UDHR) supports this in recognizing that all people have a

"right to a standard of living adequate for the health and well-being of himself and his family",

which cannot be achieved without access to fresh water. Gleick (1999) argues that meeting this standard of living requires access to a minimum amount of fresh water, therefore the right to water is fundamental to the fulfilment of the UDHR, though it is not explicitly expressed. Other, less important rights, such as the right to work, are explicitly expressed in the UDHR, however, further supporting the conclusion that Article 25 implicitly supports the human right to water (Gleick 1999).

Despite implicit reference to the human right to water, it is inadequately reflected in current international, regional and national legal instruments, possibly as a result of the development of international water law preceding the development of international human rights law and the highly sectoral nature of the approach to water management at all levels. Gleick (1999) suggests that

"at a minimum...the explicit right to life, and the broader rights to health and well-being described [in the Human Rights Declarations and Covenants], must include the right to sufficient water, at appropriate quality, to sustain life".

The exclusion of the right to water would render the explicitly stated rights in those conventions and declarations meaningless (Glieck 1999).

In the paragraphs above, the inadequacies inherent in international legal instruments have been examined, most specifically, the lack of explicit reference to water as a fundamental human right, and the confusion as regards mechanisms for the provision of adequate water supplies to fulfil that right. Generally, international law is the approach that has been taken to transboundary water resource management, but it is perhaps an "inappropriate mechanism" (Glieck 1998), because it is a regulatory mechanism. The human rights approach, however, regulates not only the behaviour of sovereign states toward each other, but also the actions states carry out internally, over their own citizens. Because "well-being" is essentially derived from the environment in which any human being exists, it also informs the practice of both water and environmental management within and between states (Mohammed-Katerere 2001), and highlights the interconnectedness of water and environmental management in upholding the Universal Declaration of Human Rights.

Establishing a human rights framework as an approach to water resource management is dependent on the inclusion into management practice of a number of critical factors. As a strategy for moving toward sustainability of transboundary water resources, consideration of these critical factors is vital.

4.8. A STRATEGY FOR SUSTAINABLE RESOURCE USE

As Figure 4.2 describes, sustainability in water management is as much a function of effective water, environmental and human resource use management and planning as it is of the implementation of international and national law regulations. Therefore, in moving toward sustainability in transboundary water resources, it is essential to consider the power relations between and within states, so that imbalances can be addressed at the outset, and equity can be approached in agreements. Furthermore, without the recognition that an international watercourse imposes its own boundaries, which transcend the political boundaries associated with it, the sustainability of the use of water in the entire watercourse or basin is forever under threat. Finally, international management of watercourses must include and provide for the management of the riparian environment, not simply the water in the watercourse. In each of these critical elements of sustainable resource use in transboundary water management, there are significant factors to consider.

i) **Power relations between states**

International legal instruments currently regulate the formulation of transboundary agreements. However, its inadequacies in terms of addressing inequalities in inter-state power relations have been illustrated in the analysis in Table 4.3 and in the discussion of the inadequacies of application of the equitable use principle as set out in the UN Convention and the SADC Protocol. In a strategy for sustainability, it is therefore essential that states address such inequalities in transboundary agreements, and ensure that "equity" is not determined by the relative power of the member states. This requires a careful interpretation of international law which includes international customary law as set out in the Universal Declaration of Human Rights, and the 1966 International Covenant on Economic, Social and Cultural Rights, as well as other instruments of international customary law which support these issues.

Furthermore, riparian states entering into a water-sharing agreement must identify areas where incompatibility exists between their national laws, and between their national laws and international rights-based customary law.

Regional protocols can address some of the issues at a regional level that international instruments fail to do. However, if true sovereignty over water is held by the people who use it (GCI 1999), it is essential to consider their rights in the management systems applied to their most valuable resource. Therefore, transboundary agreements formulated with the knowledge of inadequacies in both regional protocols and international law, should attempt to address those inadequacies themselves, to promote the principles of equity and sustainability on which they are founded.

ii) **Power relations within states**

Decision-making power of citizens within a state as regards use and management of resources is generally regulated by national law. In promoting sustainable use of water, it is vital that local customary laws and land and resource tenure is also taken into account. In Africa especially, rural populations have strong tribal traditions, many of which are not accounted for in national water laws. Local government planning for resource use is often not effectively communicated to the local population, making planning difficult to implement and leading to local conflict (Mohammed-Katerere 2001).

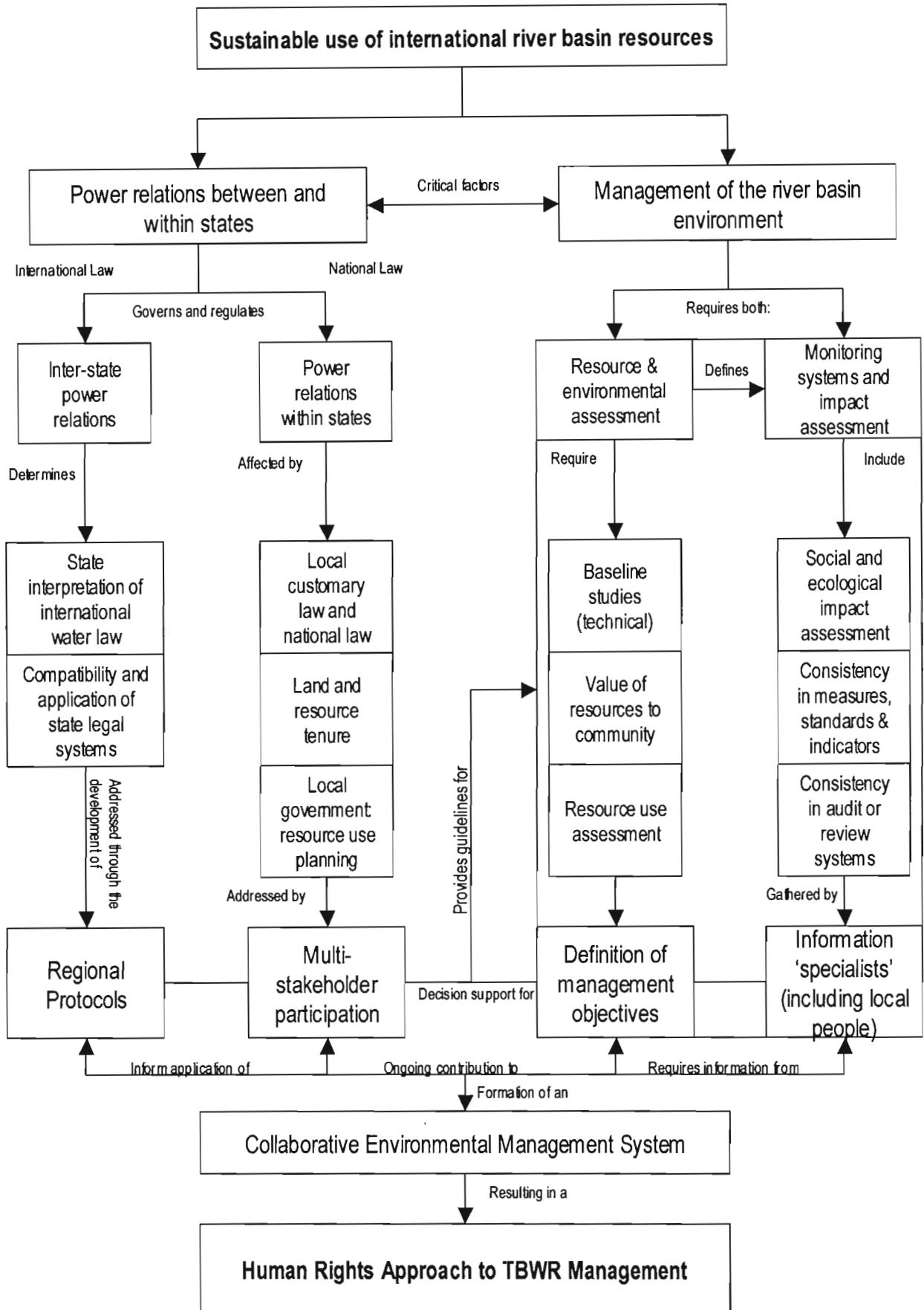


Figure 4.2: A strategy for sustainable resource use

In promoting sustainability of resource use, these concerns could be addressed through multi-stakeholder participation mechanisms, which allow local users of resources to participate actively in management decisions. Such mechanisms could also further the promotion of human rights in transboundary water resource management agreements, by providing information regarding local users' concerns and their implications at an international level.

A merging of the "developed" world's model, with the traditional practices of resource management, in a collaborative system through multi-stakeholder participation, which supports the rights of the state and the rights of the individual could provide a more effective approach to water management.

Management decisions made in such a strategy would be more acceptable to the users of resources, promoting long-term commitment to implementing decisions, and flexibility in formulating management objectives (Mohammed-Katerere 2001; Allen 2000; van der Lee 2002).

Such a strategy necessitates a new understanding and application of the principles of environmental management, given the interconnectedness of water, the environment and the users of resources.

iii) Environmental management

In the Twentieth Century, human development was characterized by primarily "getting and spending", particularly following the Second World War with the rise of capitalism, and the development of the market economy. Environmental awareness began emerging as a global public concern following the "Limits to Growth" report in which the Club of Rome outlined the five trends of global concern: "accelerating industrialisation, rapid population growth, widespread malnutrition, depletion of non-renewable resources and a deteriorating environment" (Meadows *et al.* 1996 in Connelly & Smith 1999:41).

This initiated a series of global conferences related to the management and conservation of the environment over the next twenty years, culminating in the Rio Declaration at the Earth Summit in 1992, and the development of Agenda 21, the UN action plan for environment and development. Further support for a human rights approach to environmental and water management comes in the form of the recognition of the rights of indigenous people, women, children, farmers and tribal minorities in the adoption of the Vienna Declaration and Programme of Action, which entrenches these rights in international legal instruments (Mohammed-Katerere 2001). This is particularly

important in terms of water and environmental management in Africa, where redress of historical injustices is necessary on such a large scale.

Social environmental assessment is, therefore, an essential factor in environmental management, and one that must be applied in management practice. The questions of resource ownership is vital to the assessment and monitoring of water resources, especially in rural areas in Africa, where implementation of management systems provided for in national laws, is necessarily decentralised.

As essential as these considerations are to sustainable water and environmental management, the analysis in Table 4.3 demonstrates that they are seldom applied in practice in existing transboundary water resource agreements, even those agreed between countries with a sophisticated human rights political and legal framework.

Applying baseline and monitoring environmental and water resource assessment, including social factors, by devising "systems for assessing the value of competing land use systems" (Mohammed-Katerere 2001:37), as opposed to simply volumetric measures in allocation of water will further the application of the human rights framework, and contribute to the effective implementation of national legal systems. Essentially, this will improve the integration of supply and demand management in international water resources.

Savenije and van der Zaag (2000) identify three critical factors for transboundary river basin management:

- Integrated supply and demand management
- Public participation
- Enhanced regional economic integration

Integration implies management objectives which take into consideration the widest possible range of factors and apply them effectively to water use, a move away from the prevailing sectoral approach to water management (Katerere, Hill & Moyo 2001). Therefore, to "integrate" management of water resources as described in the above criteria, an overall management strategy, which is both transparent and accountable to local users, is essential in order to take into account the requirements of the numerous users of the watercourse, including the environment, and to promote sustainability and equity in water-sharing agreements.

To address this, the principles of collaborative management must be applied to transboundary river basin agreements, to support more effective local public participation, and establish a link between human rights and water allocation (Mohammed-Katerere 2001).

4.9. COLLABORATIVE MANAGEMENT OF WATER RESOURCES

“A genuinely integrated approach to river basin management calls for the explicit inclusion of the often ignored socio-cultural aspects of water management, using a participative approach which promotes social learning”.

(van der Lee 2002:11)

Rural people, the primary users of many of the basins in Southern Africa, have for centuries interacted closely with their environment and the benefits and resources it provides for them. Consequently, there are many examples of traditional resource management strategies, which have regulated the use of natural resources in rural areas. Incorporating these into management structures and institutions through effective public participation, and local implementation of decisions and management objectives could significantly improve the long-term effectiveness and sustainability of transboundary management institutions, especially as “institutional systems for planning and decision-making ... cannot (if rights are taken into account) be based on hierarchies of technical competence” (Mohammed-Katerere 2001:21). An example of such a ‘hierarchy of technical competence’, is the Lesotho Highlands Water Project (LWHP) on the Orange / Senqui River Basin. The LWHP is described by Muthembwa (1998:8) as “the most complicated engineering endeavour of its kind in the world”, though it is perhaps recently eclipsed in scale by the Three Gorges Dam project.

At the time of its formation, South Africa was a colonial power in Namibia, which is the downstream user in the basin. Consequently, Namibian uses were not researched adequately according to international law (Mohammed-Katerere 2001). Furthermore, the Treaty does not contain any mechanisms for “adjusting SA’s takeoff as Lesotho’s own needs grow” (Mohammed-Katerere 2001:4). While there is little doubt that the technical needs of such a project would be more than adequately addressed by expertise provided by South Africa, the lack of consideration of potential needs in both a partner in the Treaty (Lesotho) and a co-riparian state (Namibia) illustrates a lack of consideration of the rights of users within those states, and of the states themselves.

Margerum (2001) outlines four substantive principles of integrated management:

- A holistic (system-wide) approach
- An appreciation of the interconnectedness of these systems, in transboundary problems, biophysical and socio-economic relationships
- Agreed goals or management objectives
- A strategic approach to decision-making focussed on key actions

If these principles are to be implemented in the management of international river basins, it is important to examine some of the complexities of 'public participation' in current practice. It is also important to note that 'public participation' does not describe fully the term 'collaborative management', though it is very often taken to do so. 'Public participation', therefore would be an important step toward collaborative management, but it must be taken further by consigning decision-making power to the public who do and who should participate in a collaborative management system for an international river basin.

i) Partnership or panacea

Current natural resource management organisations, however, generally limit public participation to providing the local users of the resources with information of a *fait accompli*. For example, in the case of the Pongolo River in South Africa, stakeholder meetings are held to assess the requirements of the community in terms of the timing and volume of controlled releases from the Pongolopoort Dam. In the absence of effective mechanisms to integrate those requirements into decisions made, the stakeholders are simply informed of the timing of releases, which may or may not agree with the requirements outlined at the meeting (Poultney *pers. comm.* 2002; Arendse *pers. comm.* 2002). As van der Lee (2000:1) contends, "stakeholders are, at best, tokenistically involved in the consultation process".

Margerum (2001) suggests a number of reasons why this may be the case. Firstly, the management organisation may not have the legal mandate to delegate decision-making to local stakeholders or local government. In the case of water resources, this is often related to the strategic importance and security issues attached to a nation's water resources. Secondly, the lack of financial resources to support active participation by stakeholders is perceived by many organisations to preclude effective integration of local actors. Integrated management necessitates the involvement of a range of organisations or of government departments. Looking specifically at government support of local

participation, many departments may feel that the responsibility to provide financial support lies with the department whose 'core business' is the management of a particular resource. For example, the ecosystem, which supports local economic and agricultural activities, of the Pongolo floodplain has degenerated partly from a lack of effective management objectives as regards flood releases. However, government financial support for projects supporting local participation in release management is currently sought primarily from DWAF, as opposed to a combination of the water, environmental, economic development and agricultural sectors.

Other barriers to participation are a lack of understanding on the part of administrators as to how to integrate stakeholders in decisions, and how to inform stakeholders of areas where there is legal mandate for participation. Often, this is dependent on the level of personal commitment demonstrated by the administrator. Finally, there is often a reluctance to share decision-making power with local actors, though this is seldom expressed explicitly.

In Africa, especially rural Africa, there are added complications. One, as suggested by Mohammed-Katerere (2001), is the insecurity surrounding land and resource tenure, so often experienced by marginalised local actors. Transboundary water agreements formulated at the level of state can add to that insecurity by not considering traditional rights to water resources, which could manifest itself in unplanned use of the water resource, if not catered for in the agreement.

Furthermore, historically disadvantaged, disempowered and generally rural poor local actors are often perceived to be without knowledge about management of water resources, and therefore their participation is often actively discouraged. The prevailing "Western" worldview often regards traditional or indigenous knowledge of resource management as inferior to the technical expertise which is generally used to support water allocation decisions.

ii) **Indigenous approaches to water management**

"As the literature on water conflict negotiations continues to grow, one resource of expertise remains untapped – that of indigenous populations who have historically inhabited arid regions throughout the world."

(Wolf 2000)

In his study of indigenous water management and conflict resolution among people living in the High Atlas Mountains in Morocco, and in the Negev desert in Israel, Wolf (2000) outlines a number of

indigenous strategies which have regulated water use and both avoided and resolved conflicts over water for centuries. They are briefly outlined below:

- Allocating time and not quantity (of water abstraction) allows water management to take place at the level of the individual user and also encourages users to plan their water use. For example, a water user can abstract water from a water resource for a specified time, rather than abstracting water according to a specified volumetric amount. This could be translated at international level to users (or member states) being allocated specific time periods for abstraction. This would, however, necessitate an investigation of the method of abstraction of each user, given that those with more sophisticated or powerful methods of abstraction may be at an unfair advantage. This kind of allocation may allow for trading of "water time" if it is not used, as well as encouraging water conservation.
- Prioritising use of water according to strict criteria, beginning with drinking water is a Berber technique. Given the disputes that have arisen over the factors to be considered for sustainable and equitable utilisation according to the UN Convention, prioritising use is essential for effective water management. In small societies (such as the Berber groups), this is naturally, less complex than at international level. However, cost benefit analyses, including environmental costs could be performed to assist the prioritising process, for more effective application of the terms of the UN Convention.
- Traditional societies, such as those in the High Atlas Mountains and the Negev Desert, have clearly defined water authorities, whose function is to arbitrate or facilitate in disputes. Rather than litigation, which has not often proved successful, especially in disputes where protagonists have power inequalities, an international water dispute resolution body could perform such functions.
- Finally, these societies often engage in "shared vision" exercises, where disputants discuss shared histories and values before explaining the dispute. This seems an essential technique given the interconnectedness of water, use of water resources and human survival.

Given the widespread predilection for placing the management of water resources under the aegis of engineers and other technical experts, the inclusion of a new form of "technical" knowledge should

not be difficult to achieve with the idea that “information specialists” already exist in local communities using the resources.

Therefore,

“while the role and value of technical knowledge should not be trivialised,...systems based on communication and transparency between different kinds of “specialists” (including local “ordinary” people) should be created”

(Mohammed-Katerere 2001: 33)

There are valuable lessons, therefore, to be learned from indigenous water management techniques, and assuming that if,

“in the short term, there will be no major shifts in financial resources to the environmental or development sectors, nor will current policies be massively altered to change the status quo, then we need strategies for other ways of empowering people and changing current practices.”

(Allen 2000)

4.10. SYNTHESIS

Chapter 3 illustrates how the remote nature of the study area makes centralised management difficult, as does the number of historically disadvantaged stakeholders, a factor further complicated by the legacy of apartheid: the Pongolopoort Dam.

Release management has been ineffective in terms of supporting ecological processes and development in the area is haphazard and unplanned. Through fieldwork in the area, the researcher has observed unplanned water use, as most of the community draws water directly from the river, because they are too poor to pay for it at the water stations of the Shemula supply scheme. With a growing population, this is likely to have an effect on any agreements signed with Moçambique, such as the Incomaputo agreement signed at the Earth Summit in Johannesburg (Kasrils 2002).

Unplanned land-use practice has also had an impact in South Africa (Poultney *pers. comm.* 2002), and the area forms part of the Lubombo Spatial Development Initiative (LSDI), and the proposed Lubombo Transfrontier Conservation Area (TFCA) (Mohammed-Katerere 2001).

In this chapter, the theoretical concepts behind transboundary water management were examined in an international context. There is the provision in international customary law, as well as implicitly in human rights conventions such as the Universal Declaration of Human Rights, for a human rights framework for water resource management. Given the rural nature of the area of study, its application is imperative if the stakeholders in this area are to be included in the implementation of water management decisions, and the formation of management objectives.

4.11. CONCLUSION

Analysis of current trends in transboundary water management has shown that although the approach to many agreements remains state-driven, there is a move toward the inclusion of local users' and ecological concerns. Both the UN Convention and the SADC Protocol provide frameworks for the inclusion of such concerns into bilateral and multilateral agreements, though operationally, this has not been achieved to a significant extent. There is an overwhelming emphasis on technical measures, and little effective implementation of social and ecological requirements into transboundary basin management systems. This is primarily as a result of extensive experience with technical measures in water management, the fact that environmental costs and benefits are more difficult to measure and assess, and benchmarks are seldom agreed between co-riparians with dissimilar environmental management systems.

Research into the measurement of social costs and benefits in international water management at the level of the individual is relatively new and has, for the most part, been excluded from water management agreements. This is often as a result of the strategic importance of water to riparian states, which leads to a perception of a need for secrecy surrounding international water negotiations. However, because of the increasing discourse around human right to water, (though it is not yet explicitly stated in international law), states entering into water agreements are beginning to consider methods to include local users, especially in the implementation phase. Collaborative management is seen as one way to achieve this, but to move toward effectiveness, higher levels of transparency in the negotiation and implementation phases of international agreements are required. The creation of institutional management structures which effectively employ the efforts of local users and communities is, as yet, uncommon in transboundary management, though there is recognition of the need for such structures.

In the Maputo basin, the recently signed Incomaputo agreement has not yet reached the level where the concerns of local users are considered and the TPTC is not yet an organisation which demonstrates the levels of transparency and accountability which have been shown to be so critical to effective transboundary water management. However, in the study area (below the Pongolopoort Dam), communities are deeply involved in water management, but institutional support and the level and extent of their effective involvement is in the process of being devised through programmes at a local level. It is important that lessons from such programmes be translated to an international level through basin-wide integration efforts. Programmes which have managed to achieve this to a large degree do exist, and lessons from these programmes (such as the IUCN Sahelian Wetlands Project) could be incorporated with political will.

Other sectors such as the health sector have provided lessons in the inclusion of local communities on the Moçambique side, where a severe lack of infrastructure could have undermined successful efforts. The Regional Malaria Control Council programme could advise or provide community communication structures for the water sector, at the same time as it improves inter-sectoral management, which would result in a move toward a more integrated approach.

A major constraint to effective transboundary water management (even national water management) is the sectoral approach to water. Traditionally, Water Affairs departments in most nations are responsible for the nation's water, an approach which is prevalent in both Moçambique and South Africa. Other departments, such as Agriculture, Environmental Affairs and Economic Development are seldom included in transboundary basin negotiations, a situation which to a large extent constrains the sustainable management of the basin, as strategic and integrated management is impossible if the concerns of only one sector are considered. The legal systems in both Moçambique and South Africa have addressed this, as both make provision for ecological considerations and for public participation in water management. It is in implementation of these progressive laws that a great deal of effort remains necessary. This is unlikely to become a reality without a significant change in current mindset and political will.

By bringing together these important concepts into a collaborative management strategy for transboundary water resources, it is possible, to move toward the human rights framework in water resource management. Such a strategy promotes sustainable resource use, allowing the benefits of international watercourses to be enjoyed by all, rather than for a short time, by the powerful few.

REFERENCES

Allen, W. 2000. *Future directions for research into collaborative learning: Helping people maximise the use of technical information within multi-stakeholder environmental management contexts* [Online]. Natural Resource Management – changelinks. Working Paper No.2. June 2000. Massey University. New Zealand. Available at: <http://nrm.massey.ac.nz/changelinks/>. [Accessed: 27 May 2002].

Anon. 16 November 2001. *IUCN Press Release: Experts launch action plan for rivers in West Africa* [Online]. Mali: IUCN. Available at: <http://www.iucn.org/themes/wetlands/sawegpr.html>. [Accessed: 18 May 2002].

Arksey, H and Knight, P. 1999. *Interviewing for Social Scientists: An Introductory Resource with Examples*. London. SAGE.

Bourne, CB 1997. The Drainage Basin Approach. In: Wouters, P. (ed) *International Water Law*. London: Kluwer Law International.

Bourne, CB 1997. The Right to utilize waters. In: Wouters, P. (ed) *International Water Law*. London: Kluwer Law International.

Breen, CM, Dent, MC and Mander, M. 1998. *The Pongola River floodplain and its people*. Paper presented at International Conference on Sustainable Rural Development, Salzburg, Austria. [Online] South Africa: Mark Dent's Home Page. Available at: <http://www.cwr.ac.za/cwr/users/dent/pongola.htm>. [Accessed: 15 April 2002]

Bruwer, C, Poultney, C and Nyathi, Z. 1996. Community-based Hydrological Management Phongolo Floodplain. In: Acreman, MC and Hollis, GE (eds). *Water Management and Wetlands in Sub-Saharan Africa: 199-211*. Gland. Switzerland. IUCN.

Bruwer, CA and Jordaan, JM 1994. The Pongolo Floodplain Pans: Inundation by Programmed Seasonal Releases of Water from Pongolapoort Dam. In: *18th Congress: International Commission on Large Dams Q61-R41: 649-657*.

Charrier, B. 1998. *An environmental assessment of Kuwait: Seven years after the Gulf War: Final Report* [Online]. Green Cross International Report: Environmental Legacy in Kuwait. Available at: <http://www.gci.ch/GreenCrossPrograms/legacy/Kuwait/kuwait7years.html>.

[Accessed: 30 September 2002].

Connelly, J and Smith, G. 1999. *Politics and the Environment: From theory to practice*. London: Routledge.

de Chazournes, LB. 1998. *Changing perspectives in the management of international watercourses: An international law perspective* [Online]. University of Geneva. Available at:

[http://www.up.ac.za/academic/libarts/polsci/awiru/opp/papers/prof I boisson chazournes.pdf](http://www.up.ac.za/academic/libarts/polsci/awiru/opp/papers/prof%20boisson_chazournes.pdf).

[Accessed: 13 February 2003].

Dowdeswell, E. 1998. Where Peaceful Waters Flow. *Water International* 23: 13-16.

Elmusa, SS. October 1998. *Harmonising Equitable Utilisation and Significant Harm* [Online].

Washington D.C. Paper presented at the Conference on "Water, Dispute Prevention and Development: South Perspectives". Centre for the Global South. American University. Available at: <http://www.american.edu/maksoud/water98/present7.htm>. [Accessed: 15 August 2002].

Environmental News Service. 2002. *Dry Rio Grande point of US / Mexico friction* [Online].

Environmental News Service (ENS) 2002. Available at: <http://ens-news.com/ens/may2002/2002-05-17-05.asp>. [Accessed: 7 September 2002].

Glieck, PH. 1999. The Human Right to Water. *Water Policy* 1 (5): 487-503

Glieck, PH. 1998. *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*. Island Press: Washington D.C.

Glieck, PH. 1998. Water in Crisis: Paths to Sustainable Water Use. *Ecological Applications* 8(3): 571-579.

Godwin, P. Without borders: Uniting Africa's wildlife reserves. *National Geographic* September 2001: 2-29.

Green Cross International. 1999. *National Sovereignty and International Watercourses. Paper prepared for the World Commission on Water for the XXI Century*. Green Cross International: National Sovereignty and International Watercourses Panel. Geneva. Switzerland.

IUCN / African Development Bank. 2000. *Sahelian Floodplains, Challenges and Perspectives: Proceedings of the Regional Conference. Yamoussoukro 7-9 October 1999*. Burkina Faso. IUCN Regional Office for West Africa.

IUCN. 2001. *Towards the Sustainable Management of Sahelian Floodplains* [Online]. Mali: IUCN Regional Office for West Africa. Available at: <http://www.iucn.org/themes/wetlands/saweg-guidelines.PDF>. [Accessed: 2 May 2002].

Heeg, J and Breen, CM. 1994. Resolution of Conflicting Values on the Pongolo River and Floodplain (South Africa). In: B.C. Patten et al (eds). *Wetlands and Shallow Continental Water Bodies 2*: 303-359. SPB Academic Publishing. The Hague. The Netherlands.

Heeg, J and Breen, CM. 1982. *Man and the Pongolo Floodplain*. South African National Scientific Programmes Report No. 56. Council for Scientific and Industrial Research.

Kasrils, R. 2002. *Forward to Johannesburg and Hydro-solidarity* [Online]. Speech to Stockholm Water Symposium. August 2002. Stockholm. Available at: <http://www.dwaf.gov.za/communications>. [Accessed: 9 September 2002].

Katerere, Y, Hill, R and Moyo, S. 2001. *A Critique of Transboundary Natural Resource Management in Southern Africa*. Paper 1: IUCN-Regional Office of Southern Africa Series on Transboundary Natural Resource Management in Southern Africa [Online]. Available at: <http://www.iucnrosa.org.zw/tbnrm/publications.html>. [Accessed: 12 August 2002].

Kuylenstiera, J and Najlis, P. 1998. The Comprehensive Assessment of the Freshwater Resources of the World – Policy Options for an Integrated Sustainable Water Future. *Water International*. 23: 17-20.

Leestemaker, JH. 2000. *An analysis of the new national and sub-national Water Laws in Southern Africa: Gaps between the UN Convention, the SADC Protocol and national legal systems in South Africa, Swaziland and Moçambique* [Online]. Paper for the Institutional Support Task-team of the Shared River Initiative on the Incomati River, Southern Africa. Available at: <http://www.thewaterpage.com/leestemaker.htm>. [Accessed: 31 July 2002].

Margerum, RD. 2001. Organisational Commitment to Integrated and Collaborative Management: Matching Strategies to Constraints. *Environmental Management* 28(4): 421 – 431.

Mohammed-Katerere, J. 2001. *Review of the Legal and Policy Framework for Transboundary Natural Resources Management in Southern Africa*. Paper 3: IUCN-Regional Office of Southern Africa Series on Transboundary Natural Resource Management in Southern Africa [Online]. Available at: <http://www.iucnrosa.org.zw/tbnrm/publications.html>. [Accessed: 12 August 2002].

Milich, L and Varady, RG. 1998. Openness, sustainability and public participation in transboundary river basin institutions [Online]. *Arid Lands Newsletter* 44. Fall / Winter 1998. Available at: <http://ag.arizona.edu/OALS/ALN/aln44/varady-milich1.html>. [Accessed: 31 July 2002].

NetCoast. 2001. *Twinning of river basin organisations* [Online]. NetCoast. The Netherlands. Available at: <http://www.netcoast.nl/projects1/twinning.htm>. [Accessed: 17 March 2003].

Neuman, W.L. 2000. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston, USA: Allyn and Bacon.

Quinn, N and Kemp, M. 2000. *Transboundary water resources: From sovereignty to co-governance*. Centre for Environment and Development. University of Natal. Pietermaritzburg.

Sadler, B. 2001. *Intent vs. Effect: Bombing and Sanctions create humanitarian crisis in Iraq* [Online]. Test Adaptation of CNN Special Report: The Unfinished War: A decade since Desert Storm. CNN

International. Available at:

<http://europe.cnn.com/SPECIALS/2001/gulf.war/unfinished/war/index1.html>. [Accessed: 30 September 2002].

Savenije, HHG and van der Zaag, P. 2000. *Towards the improved management of shared river basins: Lessons from the Maseru Conference*. Policy 2: 47-63.

Sills, J. 1998. *Summarising the first day's actions* [Online]. Summary speech at the Conference on Water, Dispute prevention and Development. 12-13 October 1998. Centre for the Global South. American University. Washington D.C. Available at:
<http://www.american.edu/maksoud/water98/present7.htm>. [Accessed: 15 August 2002].

Van der Lee, J. 2002. An Integrated Learning Approach to River Basin Management. *Resources Policy* 8(1): 11-13.

Van der Lee, J.J. 2000. *Participative water resource allocation and decision-making in Australia*. Proceedings of the Xth World Water Congress, Melbourne, 12-17 March 2000.

van Wyk, A.E. 1994. *Maputaland-Pondoland Region: South Africa, Swaziland and Mozambique*. In: Davis, S.D., Heywood, V.H. and Hamilton, A.C. (Eds). *Centres of Plant Diversity. A guide and strategy for their conservation*. Cambridge: IUCN Publication Unit.

Wolf, A.T. 2000. *Indigenous approaches to water conflict negotiations and implications for international waters* [Online]. Transboundary Freshwater Dispute Database. Available at:
<http://terra.geo.orst.edu/users/tfdd/documents/indigenous/index.html>. [Accessed: 8 September 2002].

PERSONAL COMMUNICATIONS

Mr C Arendse, Control Technician, Northern Catchment Management area, KwaZulu-Natal Department of Water Affairs and Forestry. (031) 336-2700.

Mr TJ Buthelezi, Chairman POWAETA. 082 362 292.

Mr P Conant, Co-ordinator - Resource Use, Ezimvulo KZN Wildlife. (035) 870-0552.

Mr S Goedste, Manager, Makhatini Research Centre, KwaZulu-Natal Department of Agriculture (Jozini). (035) 572-5303.

Mr JK Gumede, Chief Health Inspector, KwaZulu-Natal Department of Health (Jozini). (035) 572-1021.

Ms C Hanekom, Research Technician, Ezimvulo KZN Wildlife. (035) 592-0001.

Dr J Jaganyi, Research Fellow, University of Natal, Pietermaritzburg. (033) 260-5547

Mr BC Nkabinde, Head of Department, Control Development Technicians, KwaZulu-Natal Department of Agriculture (Jozini). (035) 572-1011.

Mr M Nxumalo, Scheme Manager, Shemula Water Supply Scheme. (035) 592-1046.

Mr J Perkins, Chief Engineer: Water Resources, KwaZulu-Natal Department of Water Affairs and Forestry. (031) 336-2700.

Mr C Poultney, Social Anthropologist, Consultant and Resident of the floodplain. 082 491 0062

Mr W Urquhart, Deputy Director, KwaZulu-Natal Department of Agriculture. (033) 343-1397.

Mr N van Wyk, Director, Water Resource Planning, Department of Water Affairs. (012) 336-8327.

ENDNOTES FOR TABLE 4.3

- 1 Milich, L and Varady, RG. 1998. Openness, sustainability and public participation in transboundary river basin institutions [Online]. *Arid Lands Newsletter* 44. Fall / Winter 1998. Available at: <http://ag.arizona.edu/OALS/ALN/aln44/varady-milich1.html>. [Accessed: 31 July 2002] at Part 3:1.
- 2 Earle, A. 2001. *The Rhine River* [Online]. The Water Page. Available at: http://www.thewaterpage.com/rhine_main.htm. [Accessed: 6 September 2002] at 3.
- 3 Dros, H and van Haselen, C. 2000. *Rhine Basin* [Online]. Synthesis of Session discussions at the Second World Water Forum. Available at: <http://www.worldwaterforum.net/Dossiers/docs/rhinebasin.pdf>. [Accessed: 8 September 2002] at 3.
- 4 Wolf, A. *Transboundary Freshwater Dispute Database* [Online]. Available at: <http://terra.geo.orst.edu/users/tfdd/>. [Accessed: 5 September 2002].
- 5 Mohammed-Katerere, J. 2001. *Review of the Legal and Policy Framework for Transboundary Natural Resources Management in Southern Africa*. Paper 3: IUCN-Regional Office of Southern Africa Series on Transboundary Natural Resource Management in Southern Africa [Online]. Available at: <http://www.iucnrosa.org.zw/tbnrm/publications.html>. [Accessed: 12 August 2002] at 47.
- 6 Republic of South Africa National Water Act 36 of 1998 s108.
- 7 International Boundary Water Commission (IBWC). Undated. *Treaty between the United States and Mexico 1944* [Online]. Available at: http://www.ibwc.state.gov/FORAFFAI/body_1944_treaty.HTM. [Accessed: 6 September 2002] at 1.
- 8 Anon. 2002. *Sharing Water: Towards a Transboundary Consensus on the Management of the Okavango Delta*. Unpublished Proposal by The Natural Heritage Institute and the World Conservation Union (IUCN): Regional Office for Southern Africa (ROSA) at 2.
- 9 Mutembwa, A. 1998. *Water and the potential for resource conflicts in Southern Africa* [Online]. Global Security Fellows Initiative: Occasional Paper No.3. University of Cambridge. Available at: <http://www.dartmouth.edu/~gsfi/gsfweb/htmls/papers/text3.htm>. [Accessed: 6 September 2002] at 17.
- 10 Gliick, PH. 1998. *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*. Washington D.C.: Island Press at 121.
- 11 Kelly, M and Chapman, K. 2002. *Sharing the Waters* [Online]. Investigative Article for Americas Program at the Interhemispheric Resource Centre. Available at: <http://www.americaspolicy.org/commentary/2002/0205water.html>. [Accessed: 7 September 2002] at 1.
- 12 Allison, P. 2002. *International Water Hotspots* [Online]. In: ITT Industries Guidebook to Global Water Issues September 2002 pp42-43. Available at: www.ittfluidtechnology.com/waterbook/page42.pdf. [Accessed: 14 August 2002] at 44.
- 13 Farinelli, P. 1997. *Freshwater conflicts in the Jordan River Basin* [Online]. Green Cross International. GC Reports. Available at: <http://www.gci.ch/GreenCrossPrograms/waterres/gcwater/jordan.html>. [Accessed: 6 September 2002] at 4.
- 14 Leestemaker, JH. 2000. *The Domino Effect: A downstream perspective in water management in Southern Africa* [Online]. Paper for the Shared Rivers Initiative Programme. The Water Page. Available at: www.thewaterpage.com/WWW-domino2.PDF. [Accessed: 14 August 2002] at 2.
- 15 ICPR. 2001. *Topic Rhine 20th Edition July 2001* [Online]. ICPR. Available at: <http://www.iksr.org/RA%2020e%20Internet-ausgabe.doc>. [Accessed: 21 February 2003].
- 16 Anon. 1999. *Scientists meet for Shared Rivers Initiative* [Online]. SA Water Bulletin. Water Research Commission. Available at: www.ittfluidtechnology.com/waterbook/page42.pdf. [Accessed: 8 September 2002] at 1.
- 17 Anon. 2002. *Dry Rio Grande point of US / Mexico friction* [Online]. Environmental News Service (ENS) 2002. Available at: <http://ens-news.com/ens/may2002/2002-05-17-05.asp>. [Accessed: 7 September 2002] at 1.
- 18 Convention on the Protection of the Rhine - Bern 1999 at Article 14.

¹⁹ Anon. 2002. *Mexico agrees to release water* [Online]. Environmental News Service at Green Cross International. Available at:

<http://www.greencrossinternational.net/DigitalForum/digiforum/articles/article2002/mexicoagrees.html>. [Accessed: 7 September 2002] at 1.

²⁰ Knoop, JM, van Puijenbroek PGM, Wortelboer, FG. 1996. *Lindane: use, emissions and fate in the Rhine Basin* [Online]. Report for Rijksinstituut voor Volksgezondheit en Mileu (RIVM). Available at:

<http://www.rivm.nl/bibliotheek/rapporten/733008003.html>. [Accessed: 7 September 2002] at 1.

²¹ Every River Project Team. 2001. *Every River has its People: Stakeholder Workshop Report*. Kalahari Conservation Society. Maun. Botswana at 3.

²² Anon. 2002. Verdant fields raise suspicions Mexican state hoarding water [Online]. The Dallas Morning News 5 May 2002. Available at:

http://www.dallasnews.com/world/mexico/stories/txcn020502_cm_water.49026952.html. [Accessed: 7 September 2002] at 1.

APPENDIX 1

INTERVIEW AND INTERVIEWEE DETAILS

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Clive Arendse
Position	Control Technician, Northern Catchment Management
Department	KwaZulu-Natal
Organisation	Department of Water Affairs
Address	88 Field Street
	Durban
Telephone	(031) 336-2700
Cell	082-808-2695
Fax	
E-mail	arendsec@dwaf.kzntl.gov.za
INTERVIEW INFORMATION	
Date	5 th November 2002
Start Time	10h00
End Time	11h50
Place	DWAF Regional Office, Durban
Reason for interview with this interviewee	Release controller – Pongolopoort Dam
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Clive Arendse.Transcription.doc"
Comments: Willing participant in the interview. Possibly more forthcoming than he would normally be as he is leaving for the US (permanently) at the end of November.	
Documents received:	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Charel Bruwer
Position	Environmental Management Consultant
Department	
Organisation	Enviro Africa (Private Environmental Management Consultancy)
Address	P O Box 5367, Helderberg
	7135
Telephone	(0283) 62-888
Cell	082-805-0190
Fax	(0283) 62-888
E-mail	charel@enviroafrica.com
INTERVIEW INFORMATION	
Date	18 th October 2002
Start Time	09h30
End Time	09h50
Place	Makhatini Research Station, Makhatini Flats
Reason for interview with this interviewee	Ex-DWAF release manager, environmental management consultant currently running a co-management programme on the floodplain (LWWP)
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Charel Bruwer Transcription.doc"
Comments: Very experienced on the floodplain, and passionate about it. Interview was carried out in a very relaxed atmosphere and Mr Bruwer was a willing and open participant	
Documents received:	

TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO MAPUTO

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr TJ Buthelezi
Position	Chairman
Department	
Organisation	POWADETA and Ubongwa (Cotton Farmers) Board
Address	Farm – Makhatini Flats
Telephone	
Cell	082-362-2492
Fax	
E-mail	
INTERVIEW INFORMATION	
Date	15 th October 2002
Start Time	13h35
End Time	14h30
Place	Taxi Rank, Jozini, KwaZulu-Natal
Reason for interview with this interviewee	Claim to represent over 4000 residents on the Pongolo floodplain
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"TJ Buthelezi Transcription.doc"
Comments: Very open, but cagey about POWADETA's relationship to Ubongwa – says they're different, but can't explain the difference.	
Documents received:	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Dr Mark Dent
Position	Private Organisational Development/ Water Resource Planning Consultant
Department	
Organisation	Netshare cc.
Address	
Telephone	(033) 345-8422
Cell	083-442-6360
Fax	
E-mail	marl@netshare.co.za
INTERVIEW INFORMATION	
Date	7 th November 2002
Start Time	12h10
End Time	13h00
Place	Netshare Offices, Pietermaritzburg
Reason for interview with this interviewee	Collaborative management, water modeling expert
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Mark Dent Transcription.doc"
Comments: Very willing and helpful participant in both interviews	
Documents received:	

TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO MAPUTO

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Ms Lorraine Fick
Position	Senior Specialist
Department	Social and Ecological Services
Organisation	Department of Water Affairs
Address	185 Schoeman Street
	Pretoria
Telephone	(012) 336-8224
Cell	082-809-5698
Fax	(012) 336-8678
E-mail	FickL@dwaf.gov.za
INTERVIEW INFORMATION	
Date	15 th November 2002
Start Time	10h00
End Time	11h40
Place	DWAF Regional Office, Pretoria
Reason for interview with this interviewee	Sustainable Utilisation Plan (SUP) development and formation of WUA for users above the Pongolopoort Dam where the SUP will be tested.
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Lorraine FickTranscription.doc"
Comments: Willing participant in the interview but seemed stilted, and ill at ease, though that improved through the discussion. Asked Paul Boucher (private consultant) to join us in the interview.	
Documents received: Draft Terms of Reference SUP, Sustainable Planning Procedure Summary, Releases Proposal from Department of Social & Ecological Services, SUP Pongolopoort Dam	

TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO MAPUTO

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Haroon Karodia
Position	Chief Director Environmental Management
Department	Environmental Affairs
Organisation	KZN Department of Agriculture and Environmental Affairs
Address	Cedara
	KwaZulu-Natal
Telephone	(033) 355-9264
Cell	082-570-1977
Fax	
E-mail	chetty@dae.kzntl.gov.za
INTERVIEW INFORMATION	
Date	1 st November 2002
Start Time	14h00
End Time	15h00
Place	DAEA Cedara
Reason for interview with this interviewee	Chief Director Environmental Management KZN
Taped interview / notes	Notes (Tape damaged)
Transcription of tape (Doc. reference)	"Haroon Karodia Answers.doc"
Comments: Tape was damaged, but notes were made immediately following the interview and sent to Mr Karodia's office for approval.	
Documents received:	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Jeremiah Mabika
Position	Farmer, member of Water Committee
Department	
Organisation	Welcome Water Committee
Address	Farm – Makhatini Flats
Telephone	
Cell	072-197-3679
Fax	
E-mail	
INTERVIEW INFORMATION	
Date	17 th October 2002
Start Time	10h10
End Time	10h20
Place	Makhatini Research Station
Reason for interview with this interviewee	Water Committee member
Taped interview / notes	Notes
Transcription of tape (Doc. reference)	"Jeremiah Mabika Answers.doc"
Comments: Interview was unplanned and conducted at the UNP / WRC workshop at the Makhatini Research Station. Eloquent and knowledgeable about floodplain processes. Farms: cotton, maize, vegetables (subsistence and some commercial)	
Documents received:	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Dr Beason Mwaka
Position	Chief Engineer
Department	System Operations
Organisation	Department of Water Affairs
Address	185 Schoeman Street
	Pretoria
Telephone	(012) 336-8188
Cell	082-807-8261
Fax	(012) 323-5041
E-mail	MwakaB@dwaf.gov.za
INTERVIEW INFORMATION	
Date	15 th November 2002
Start Time	11h50
End Time	12h35
Place	DWAF Head Office, Pretoria
Reason for interview with this interviewee	System controller – Pongolopoort Dam
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Beason Mwaka Trnascrption.doc"
Comments: Willing participant in the interview. Very surprised to hear of Clive Arendse's resignation!	
Documents received:	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Clive Poultney
Position	Social Anthropologist, Development Consultant & resident of the Pongolo floodplain
Department	
Organisation	Lubombo Water Ways Programme
Address	Near Mboza village, Pongolo floodplain
Telephone	(035) 572-5240
Cell	082-491-0062
Fax	
E-mail	nsimbi@iafrica.com
INTERVIEW INFORMATION	
Date	18 th October 2002
Start Time	10h20
End Time	11h05
Place	Makhatini Research Station, Makhatini Flats
Reason for interview with this interviewee	Lubombo Water Ways Programme, founder of water committees
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Clive Poultney Transcription.doc"
Comments: Willing, open and passionate participant in the interview.	
Documents received:	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Dr Brian Sharp
Position	Director Regional Malaria Control Programme
Department	Malaria Research
Organisation	Medical Research Council
Address	491 Ridge Road, Berea, Durban
	4001
Telephone	(031) 203-4700
Cell	082-465-0300
Fax	
E-mail	sharpb@mrc.ac.za
INTERVIEW INFORMATION	
Date	14 th October 2002
Start Time	11h00
End Time	11h55
Place	Medical Research Council Offices, Durban
Reason for interview with this interviewee	Director of a "community-driven" programme in the area of study
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Brian Sharp Transcription.doc"
Comments: Willing participant in the interview, though cagey about environmental effects of spraying. Has not previously considered integration of structures with any other sector (than Health)	
Documents received: All Moçambique data for GIS, RMCC Protocol	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Niel van Wyk
Position	Director
Department	Water Resource Planning
Organisation	Department of Water Affairs
Address	185 Schoeman Street
	Pretoria
Telephone	(012) 336-8327
Cell	082-808-5651
Fax	
E-mail	ida@dwaf.gov.za
INTERVIEW INFORMATION	
Date	25 th October 2002
Start Time	11h10
End Time	12h55
Place	WRP Consultants offices, Hilton
Reason for interview with this interviewee	TPTC Liaison, Negotiator of Incomaputo Agreement
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Niel van Wyk Transcription.doc"
Comments: Very willing and helpful participant in both interviews	
Documents received: Terms of Reference of TPTC, Draft Minutes of TPTC meetings (13 th December 2001 & 22 nd August 2001), Draft Incomati Case Study (van der Zaag & Carmo-Vaz 2001 - NOT FOR REFERENCE), Piggs Peak Agreement.	

INTERVIEW DATA

Interview by: Robyn Tompkins (202522212)

INTERVIEWEE INFORMATION	
Name	Mr Niel van Wyk
Position	Director
Department	Water Resource Planning
Organisation	Department of Water Affairs
Address	185 Schoeman Street
	Pretoria
Telephone	(012) 336-8327
Cell	082-808-5651
Fax	
E-mail	ida@dwaf.gov.za
INTERVIEW INFORMATION	
Date	15 th November 2002
Start Time	09h35
End Time	10h00
Place	DWAF Head Office, Pretoria
Reason for interview with this interviewee	TPTC Liaison
Taped interview / notes	Taped
Transcription of tape (Doc. reference)	"Second Niel van Wyk Transcription.doc"
Comments: Very willing and helpful participant in both interviews	
Documents received:	

APPENDIX 2
INTERVIEW TRANSCRIPTIONS

Transcription of Interview with Clive Arendse

Date: 5th November 2002

Interview starts: 10h00

At: DWAF Regional Office, Durban

RT: Robyn Tompkins (UNP)

CA: Clive Arendse (DWAF)

RT	Clive, I need to know some general things from you first. What is a control technician...who are you and what do you do, Clive?
CA	A control technician is basically the equivalent of a systems director, basically because I have a technical qualification, not a management qualification, so I've got a Higher Diploma in Civil Engineering, so I went on to the technical ladder, you could call it. I'm now on top of the technical ladder, basically, which is a level 10, which is the same as assistant director in admin for example, or corporate services. My duties are, currently, it's been a lot of things in the past, but currently, is to basically implement the NWA, and the section in is water resource management, which is basically things like licensing, registration...it's changed so much...and when, the reason the dam thing has come into it as well is because I'm the only person that works in the northern area...ja...so I'm familiar with the area and when Bruwer left in 1998, I think it was, I took over from him because I was the only one working in that area, so I've taken on this as an additional task, so actually, Head Office, I don't know why, but they're sort of, basically not interested, well, there's Beason Mwaka's there, he's in operations, so it's actually a bit of a mix. He's in operations; I'm in water resource management.
RT	Do you work with him closely?
CA	No, only over this issue. Over about the last year.
RT	So he's fairly new on this issue?
CA	Ja, about a year, I started 1999.
RT	Because I know you've worked on this on your own for some time.
CA	Ja, look 1999, 2000 floods, I don't think Beason has much to do with it, so he came in end of 2001, so it's about a year he's been involved.
RT	How often do you meet with him...do you have any formal basis for meetings or do you discuss with each other on a regular basis?
CA	Ja, we e-mail each other, at least every month.
RT	So there's no formal basis?
CA	No, it's crisis management.
RT	That's what I'm finding, is that inter-departmentally – well within the department, there are very few formal communication mechanisms which support the staff.
CA	Ja, well the reason that he's involved as well, is that he's a direct link now with Head Office, Barbara Schreiner and people like that, they're a floor away from each other so it's more convenient as well ton have one person at head office and one in regional, you're not going to get anywhere running to Paul Roberts every five minutes, it's crazy, and also, I've had relatively, in our eyes, successful floods up to now, so that's why nothing else has been put into place.
RT	Well, that's what I wanted to get on to next, floodplain management. Why do you say the floods are successful in your eyes, because, quite frankly Clive, there's been a lot of criticism?
CA	There is, and I've tried to be as subjective as possible, but the point is in '99, in '98 I don't think we had a flood, Bruwer left '98, so there was no flood negotiated, so then they came to us in 1999, actually, the request, I've got it on file somewhere, but I think it was mainly from POWADETA, the cotton farmers, and they said, we're worried about this dam, and they said we need our regular flood. I can't quite recall whether, because that was shoved into my face at the time, whether they were worried that it would overtop and destroy their crops, or...
RT	I think you mentioned something like that when we spoke in May.
CA	Ja, so they came to us and requested a flood from us, so I went out...we went, I went up and I think we had a brief meeting...whew, how did it work? I think we had a brief meeting and we sort of said, right OK, we'll have a flood to ensure that it doesn't overtop, so we has some flood control measures basically, and I got hold of Poultney and them at the time, I remember that, I would have records, anyway, so when I say successful, it's because we didn't have any comebacks. Didn't have anything, maybe because there was no structure was left behind, I don't know, but we didn't have anything, whereas before, I know that we were involved, before Bruwer, there was another guy that was involved, Steve Gillham, and engineer, he was involved and his main involvement was to sort out claims, losses, so I don't know what happened there, but someone may know what happened there exactly, but it was messy. But you could say...successful because there were no claims, and there weren't any known losses or quantified losses of crops or tractors or whatever, so that was 1999...then 2000, we started having regular meetings in 2000, and then we had out 2000 flood which is a big

	one, let out about 500 million. Unfortunately Moçambique, you know, had floods at the same time, so it just became, we got sort of...partially blamed for it.
RT	Ja, I know the issue with Moçambique.
CA	But the dam...I don't know if you're going to get to all that.
RT	Yes, I am, but what I wanted to ask you first is...what are your criteria for a successful flood now, if they were...I mean, knowing what we know about water management and ecological processes, what makes a flood successful?
CA	Basically that we meet the needs of everybody on the floodplain, with regard to...if we have the cotton people who are growing whatever they're growing, I know people don't like it but the fact is, they're there, and then you've got the pans that need to be filled, so if you take both of those and you say what do we do here so we don't destroy these people's crops but we also fill up the pans and we do it at such a time that the damage is going to be minimal, to nil, actually...first prize, and that's why we opted for September / October for the last...for those three years, 1999, 2000, 2001, so that is the criteria from the Region's side [DWAF Regional Office], it's not much deeper than that, to be honest.
RT	Well, that's what I wanted to ask you about next, because, POWAETA has got quite a big voice down there.
CA	They used to have; they've lost it now.
RT	Do you know why? Because they've merged themselves with the Ubongwa board...they still consider themselves a water committee, which is nonsense, they're not a water committee.
CA	They're a cotton water committee.
RT	Ja, they're a cotton committee, basically, but Buthelezi said they meet every month now that they're affiliated to the Ubongwa Board, so it seems that POWAETA has become that because, honestly, DWAF is the only government department who has even heard of POWAETA, so its quite strange.
CA	They've written letters to the Minister though.
RT	Quite frankly, in my interview with Buthelezi, he mentioned that he was very happy with DWAF, but being at that workshop, it shows you that there's a stakeholder here who is representing a few people, who has a big voice, and many stakeholders representing a large amount of people who have got a small voice.
CA	Yes, I see that...yes. I think they were...what happened at the time as well, was because Poultney and the Lubombo Water Ways wasn't actually running, was that these guys didn't have to do much to show a face, you see.
RT	Yes, I've been working on this for a while, and I appreciate the difficulties of the range of opinions on the floodplain.
CA	Well...that...our criteria for a successful flood or whatever, we actually don't really mind, actually. If I had to speak to my Director now, and I said to him, straight, what is our idea of a successful flood, he'd say "satisfying the cotton people, satisfying the pans, bottom line, those are the two parties that we are looking at, at the moment, and if you can get Agriculture to agree with Environment, you've done very well, because nobody else seems to be able to get that right. That's his concern is, it's twofold...
RT	How do you think that this problem that you've got with the stakeholders having a large voice and a small voice and DWAF not really being able to get an idea of who the stakeholders are, how do you think that that can be improved, the communication?
CA	I think what we had the other day [the workshop 15 th to 18 th October 2002, organised by Joan Jaganyi as part of the Water Research Commission Project] was a step forward to where we need to go, basically, getting all the known stakeholders together, as many as you can, maybe we need a few more and I think that's what the next meeting's about. Getting all the other departments together, because they don't come [to meetings], I've never had except KZN Wildlife, who aren't really a Department anyway, at the meetings.
RT	Except, Mr Mtshali, from Environmental Affairs came to the workshop.
CA	As long as it's not lip-service, because this is what I'm finding, you know, it's wonderful, these people have got these positions and they can give it lip-service, and they know what they should be saying, but whether or not they deliver or not is another problem and we're finding that that's a problem...you know, Agriculture, all those kind of people, I don't believe we've got the right people being represented there, actually, we need higher people there, we need your Director-Generals, remember it's a Provincial Department, they're right here, it's not a case of ooh, you're going to Pretoria or something, they're not, they're right here at Cedara, I mean, lets be reasonable, on top of that, there's national, so I mean, really, I don't think it's an unreasonable request, really, it's actually the Regional office from Agriculture that we're asking to come, but they don't come.
RT	So do you think that the situation could be improved with better inter-government-department cooperation?
CA	And other stakeholders, but yes I think the government part is important, because then it all gets dumped on to Water Affairs and yes we take responsibility to a large degree, but then we get whacked, and they say but why are you allowing, why are you allowing...and we say, but we don't allow that, that's not our that's not our jurisdiction, we can't stop cotton farmers getting off, polluting whatever, that's and environmental or

	agricultural issue, now I'm not going to do their work for them, that's what my director will say, I can't do...sorry, I don't have money for that. OK, so there's a history of that on the floodplain.
RT	Also, when the Department of Agriculture puts up a dam...
CA	Ja, look we're not against development, we're really not.
RT	Just get together?
CA	Ja...so I think going back to your question and that, the way forward, I think what we're trying to do now, unfortunately has to come from somebody else's budget whatever, which I think is a bit poor, that we haven't been able to get them together before, but I think to take advantage of it, would be good, so everybody gets together, and you form some sort of committee, that can take responsibility for the decisions and not Water Affairs, to take that responsibility, maybe Water Affairs have a good voice and a good opinion, and say guys, OK, you want to make this decision, but just remember this, you're going to take the flak and not us, because we agree the majority thing, or if we really find that it's wrong we may have to step in and say, no hang on, you're being unreasonable here, but sort of...just not playing big daddy, but playing small daddy.
RT	Well, also bringing technical expertise or whatever, to the party.
CA	Ja, but you need to end with something here, you need to end with commitment, and you need to end...and that's why I'm saying that other parties need to come in as well because...they are going to have to start to budget for it as well.
RT	Other parties as in Agriculture...
CA	The big ones seem to be Agriculture and Environment, seem to be the most applicable, Health have told us what their requirements are and if we don't listen to it there's nothing they can do anyway, but I think for humanitarian reasons we need to see what they're up to, we don't want to increase the malaria, that would be silly.
RT	Well, interestingly enough, when I did speak to Brian Sharp who's running the community-driven malaria control programme with...Gumede...who came to the workshop, they have a very good community communication structure and he's very willing to discuss how to use it, so there is a willingness on the part of...certainly the Medical Research Council who gets funding from the Department of Health, so they're working very closely with them.
CA	Ja, I'm glad they're working together, but you remember of course that Health have actually been very slack in that area, in the last couple of years, they've actually boosted up in the last year or two, they've bought a whole fleet of bakkies and everything, I mean they went mad, mad, mad...OK so they come in, in a crisis as well, that's how this country works, it works on crisis to crisis.
RT	So a little bit of co-operative governance would go a long way?
CA	Yes and I think the stakeholders or the government departments who are stakeholders need to take responsibility and they need to be honest about it or otherwise we're never going to get a solution, as far as we're concerned there is no other timing except September / October or October / November at this stage, there's no other timing.
RT	OK so as far as you're concerned, that timing is right because you haven't had any feedback.
CA	Ja, we know it's not perfect, we know that, but we've been tied to that up to now, because we've sort of has to make the decisions, actually and if we're going to make a decision, that would be it at this stage, if there's no affected crops or anything, there's not only cotton, hey, they grow their mealies, they grow their sugar, they grow all kinds of other things up there as well, vegetables...the timing for that needs to be sorted out if they are still going to be around and you can get away with a February one, I'm sure, but at this stage, we'd be very hesitant to do that, in other words we would need quite a strong motivation or quite a strong decision or unanimous...thing...to say right no, guys you can release your water in January or February at this stage, so I think we need to be flexible on that in the Department, I don't know if you're going to interview Beason, but Beason's quite adamant on a September / October flood. I'm not adamant on it, but at this stage, what else can we do?
RT	Why is Beason so adamant on it, do you know?
CA	I think because...conflict...to minimise conflict.
RT	That's perhaps not the best motivation.
CA	No...but environment is an issue, but its quantify it is not really easy, isn't it, you can say we lost...
RT	Well, you'd need some help from the Department of Environmental Affairs.
CA	Ja, but to quantify the effect on the environment is not easy to do, but you can say that we lost R million of crops, but how do you lose R4 million worth of environment?
RT	Well, it is quantifiable...but, certainly some form of environmental expertise with your management of the floodplain would help?
CA	Ja, I think so, something sound though, not gut feeling, and this and that...something sound.
RT	Ja, I spoke to Haroun Karodia who was on our field trip with us from Environmental Affairs, and he was

	absolutely blown away by the area, so I don't know, something might happen, who knows. But to get back to release meetings...what is the actual purpose of a release meeting? Did DWAF decide on that, did the stakeholders ask for it and what do you go there hoping to get out of a release meeting?
CA	OK, the release meetings are basically...we tried to pick up where Bruwer left off and LWWP were involved because they used to get the committees together and discuss the situation on the floodplain and then discuss the timing of a release so we've tried to pick up the pieces of that and as you know, the funding had run out so we got the more dedicated people coming, we got...remnants of what it was. So, when I go to those meetings, I try and look for myself on the floodplain and see OK, it's looking quite low, it's...mmm...OK I see they're walking past that pan now, they're going to the river because it's saline now, so OK, it's becoming a little bit of a problem to fetch water out of the pans, OK, so I got to that meeting, then I ask them and say what's the situation and I try and get feedback from them... they say ooh, it's the pans, or it's...actually to be honest, when it's fine, they don't come and that's actually how it is so...
RT	That's interesting, that's just what Buthelezi said.
CA	Ja, I've has meetings from 100 people to 2 people; 100 was a crisis when we didn't have a flood, and two is when you've...just after you've had a flood, trying to get feedback, you don't get it because they don't come, everything's A1 now. So the idea is to get an idea of what the situation's like on the floodplain from the people and then to start prompting them for a flood, saying well, OK guys, the dam's filling up quite nicely now, and we've got water, so...when are we going to have a flood, think about it and we'll come back in two month's time or closer to the time, so just to get the process going and if they decide not to have a flood, well that's fine as well, but that would not be the norm, so that's what I'm doing it for, plus to...I wouldn't say for the record, no for the record, I suppose, we are negotiating...doing something, we're not just coming there and saying big daddy says open the gates now and if they say we're not interested in water, and everybody says that, well then we won't give you water, but just remember, if it overflows, it overtops, it's uncontrolled, and there's nothing we can do, see they don't like...you see they also at a place where they don't know what to do either, you know, they also say well what do you mean by that, and I say, well if you get a big flood coming in and your dam's full, it's going to go over and we can't adjust anything we can't change anything...so you mean that it'll break the banks, and I say ja, ja it will...oh, no, then maybe we must look at releases, see and this is also what happens, it's a reality, the dam's there, it's a barrage...anyway, that's my idea of flood release meetings.
RT	OK, now when you do get feedback, what do you do with that...I mean how, what kind of process...OK people are happy, or they are unhappy, what then happens, you come back from Jozini and...what?
CA	OK, the unhappy people are generally...how can I say it?
RT	Well, let's assume for the moment that everyone is either happy or unhappy...so let's assume that everyone is unhappy.
CA	You'll never get that though, maybe you're talking about a majority.
RT	OK, the majority is unhappy...what do you do?
CA	Well, we look into it.
RT	Well, what is looking into it?
CA	Well, that's exactly what we did last time, the people were unhappy that we didn't have a flood last year, because of Moçambique, OK, they were very unhappy about that, I was very unhappy...OK they didn't really accept that because they say well bring the people that make the decision and they don't realise that people won't come to a hot meeting, they won't OK, they'll send kiepie here to a hot meeting, because kiepie's got buffalo skin, so...OK, so then I would look into it and say well, what's the problem, this is what last time, this is why I'm also a little bit annoyed with this whole intervention from Bruwer and our Head Office, because we're going to look into the situation, come back to the meeting and say we've investigated, we see the pans are low, when are we going to have a flood, so what Head Office did was they went and employed Bruwer and them and they went out and did an analysis and they came back and they said, it's ridiculously low, we've got to have a flood, like imminently, this is the day or whatever...we were going to do a similar thing, and we were going to wait three or four weeks anyway for notice, so we were on our track there, so...it probably did a bit of good as well because it hurried Head Office up a bit, who have final say, by the way, you must remember that, we cannot release a flood without Head Office, Barbara Schreiner's approval.
RT	Oh, really, and how do you get that approval?
CA	No, we just give them the details and they ratify it and say OK you can do that.
RT	So you actually have to have written approval?
CA	Ja, because they let Moçambique know as well, at the same time...so they do the international thing and they do the approval on principle and then we get an e-mail back or something saying...go ahead. They normally listen to us though, because if it doesn't work out they say well, you sort (indistinct) out, you know what I mean...wake up! That's where this whole claims thing comes in, because if we have a flood release, they say

	you recommended it and now you've got the claims, what are you doing, you're a bunch of idiots down there, you see, because they're not prepared to get deeper into it. That's why you saw only Beason, he's the only guy from Head Office here, that's as far as they're going to go, he's only two ranks above me, but there are still mega-ranks above him, so on the one hand it's nice that they put their trust in you, but they're doing it out of convenience as well. I don't mind doing it, it's just that, is it right, you know? I don't know, you see I've got a direct link with my director and I feed back to him...
RT	Your Director is...James Perkins?
CA	Joe Hansman. No, James is not, no...he gets paid more, but he doesn't get status, you see. So, my director's Joe Hansman, he's the Regional Director or Water Resource Management basically, we have three directors...so I can get direct feedback from him, and he'll question me and say no I agree with that or I don't agree with that...put that up to Head Office.
RT	But Barbara Schreiner's got to give you approval?
CA	Well, Barbara Schriener now, I think, but...her post now...it wasn't her before, she's moved...she's moved up now, whoever's taken her place, I don't know if he's going to be in a position to say yay or nay on that one...Ruiters...I think it's Ruiters...I can't remember, there's a new guy taken over, I think it's a guy which is basically a Chief Director and then there's Paul Roberts who hangs on to the international side of things, so between them, we get our feedback and then we have a flood, we have to do it, that's why I asked for a month, after we make a decision, I say you must give us 3 to 4 weeks, to sort out the international thing and to get Head Office approval for it, and to give notice, physical and so on, that's why I ask for 4 weeks...and they understand that.
RT	So that's what happens when feedback comes through.
CA	Ja, so I don't know if that's answered the questions why we have these meetings...
RT	Ja, it has.
CA	We like to think that's the main reason, but we do have flood time in mind all the time, next flood, next flood, next flood...
RT	You do!
CA	Yes, we do...because what we don't want them to do is come up suddenly and say we want a flood now, you know what I mean, and so we like to prime them during these meetings.
RT	So, you've got to have some sort of a process going?
CA	Ja
RT	It's not going to be something that takes place within anything less than...6 weeks at least?
CA	Ja, unless there's a major emergency...
RT	So in the normal course of events...
CA	Well...we need 4 weeks, we've asked for 4 weeks from the time of making the decision, so you probably need maybe another month to get the committee together, so it's probably 8 weeks, I would say...but emergencies are different.
RT	How do you think that the release meeting process, the feedback, getting...that 8 week process...how do you think that can be made more efficient, do you have any ideas on how that could be more efficient, not necessarily from a time point of view, but that's quite cumbersome.
CA	Is it, it's quite a major event you know.
RT	Well, yes, I understand that, but to come from Jozini...OK to get everyone together in Jozini, to Durban, to Pretoria, to Moçambique, back to Pretoria, to Durban, back to Jozini, I mean that's quite a cumbersome process.
CA	No, but that particular one is 4 weeks, I mean we cant cut it to three, I can cut it to 3, but we've asked for 4 in case somebody's not there or...
RT	And what happens if Moçambique says no?
CA	Well...that's why we're allowing the 4 weeks.
RT	OK, so if everybody down here has got together and said OK that would be a good time, and then we've got a 4 week process where Moçambique says no.
CA	Ja, basically yes, that's what we need...part of that 4 weeks is to sort out why Moçambique is saying know, we should get out there and have a look, but that didn't happen last time...we once again had to put ourselves into the Regional silo, is we cannot deal with international issues, we're not allowed to, so within that 4 weeks, if we can possibly in 3 weeks, give a week for notices, sort that Moçambique thing out as a priority, then we're on track again. If after 4 weeks we still can't resolve it, then we've got a problem, we're actually going to have to delay it for another 4 weeks, because then we have to meet again, if there's a problem with the timing thing, it becomes a little bit of a problem...but we've actually sorted out Moçambique's requirements now, I mean they always were sorted out, I don't know why they threw all their toys out the cot the other day, but we've got that...their requirement we can meet, which is about 250 cubes a second or something like that...we

	can meet that.
RT	OK. 250...that's new...it used to be less than that.
CA	No...going into Moçambique I think they said about 250, they don't actually know, it was negotiable, when we went there, they came the one night and they said, 300, we'll take 300, next night they came back they said, no, we've done some more figures, 200, but it's ridiculous, OK we'll go halfway...they don't have any real... they don't want any water actually, they don't want water into there.
RT	I wonder why that is?
CA	Because they don't want any type of flooding, they so scared of another 2000 flood, that we're running water and the Usuthu comes down and it rains, and then they end up with a disaster, it goes over the levies and it washes people away and crops, so they don't actually want water.
RT	And their infrastructure down there is iffy as well.
CA	I don't think there's any irrigation pumping there at all.
RT	No, I mean any infrastructure, roads, electricity, power etc.
CA	The estuary will need it, there must be an estuarine requirement there, but maybe we're meeting it now.
RT	It also goes along the Maputo Elephant Reserve.
CA	I didn't see that, we saw the river itself in there.
RT	Well there's the Futi Corridor, the Futi wetlands and then Bay of Maputo is [drawing a map], here, the river comes in here, and then the Moçambique coastline comes out like that, and that's the Maputo Elephant Reserve.
CA	It's got about 4 elephants left in it hasn't it?
RT	No, there are actually a few more than that, but it has been degenerated.
CA	Ja, because of the war.
RT	But it's absolutely beautiful, a beautiful area, I saw an article in the National Geographic about it.
	(Turned tape over)
RT	OK, not too many more questions, I want to get on to...since we're talking about international issues now, just this new Incomaputo agreement. Do you know about it?
CA	I just know that there was...that as you said, Niel was busy with it, that's all I knew, I didn't know what the implications are or anything, I haven't had any feedback on it at all, none. Maybe my director has, but he hasn't said anything to me about it, I don't know.
RT	Well, that's one of the issues that I discussed with Niel, is there's an agreement with allocations that are gong to be made on that basin, a basin study is going to be conducted, essentially by the TPTC, the Tripartite Permanent Technical Committee, I imagine you know who they are, now what they're...
CA	They've been operating for a while.
RT	Ja, they have.
CA	I've tried to get on to that Committee.
RT	Really?
CA	Yes, I've tried to get on to that committee and the feedback I've got is that it's not worth getting on to the committee because not much is done on it, to be honest.
RT	Well, that's very interesting because they are now the controlling authority for that basin.
CA	Well, I don't know, I don't want to speak for Niel, but I've never been to it, but, I've said, would it be wise for me to get one, and he said, no, you're not missing much, so I haven't bothered...so don't quote there, but all I know is that the effectiveness of it is questionable, speak to Niel, maybe it's organised again now, I don't know, this was a year ago.
	[Note: at no stage was RT asked to switch tape off during this discussion]
RT	Ja, it did seem to be floundering.
CA	Maybe that's the word.
RT	So you're not aware of the provisions of this agreement.
CA	No, not at all, but you see Head Office is, so when we ask for a flood, it goes to Head Office, to Paul Roberts, who I believe is involved with it, so he could probably give feedback and things, I don't know, but we don't have a direct link.
RT	So, OK, now they're starting a big study about, who needs what, what are the technical, ecological needs etc in this basin. Presumably you would be able to provide quite a significant amount of information?
CA	Ja, well obviously a consultant will do it and they'll come and see us.
RT	So the TPTC won't approach you, a consultant will approach you to get the information.
CA	Probably, I don't know, what did Niel say, who are they going to use for it? We don't have the staff for it. So it'll be a consultant, ja...see Pretoria will pay for it, their budget so we're happy about that, and then we don't mind sharing information or giving information it costs nothing to do that, ja, so that's how it will be.

RT	So why is it that...I mean the TPTC is basically Water Affairs departments in three different countries.
CA	Well...their Departments. Ja, sorry, I'm not an expert on that whole thing, I've just heard TPTC, Tripartite meetings and all that sort of thing, I've tried to get on it, no it's not the right time to get on it, nothing much is happening, it's all I've heard along the way, and now I didn't even know they were going to do a basin...I sort of did know they were going to do a basin study, I've just...they've just told...see it's not our budget, so we don't get involved, if it was ours, then we'd get fully involved with it because there's a direct interest there.
RT	Well, ja, there is a direct interest there anyway.
CA	Well it comes to this...who is paying for it?
RT	OK.
CA	Well that's like...I don't know if it's the right approach, but that's the way it is.
RT	It's the only approach at the moment.
CA	I'm the only one who's actually got any passion about that area, the rest is aaah, just sort that damn area out you know.
RT	It's a headache?
CA	Ja
RT	That's actually what I wanted to ask you...the release meetings that you have in Pongolo...
CA	Jozini.
RT	Sorry, Jozini...is there any other dam on which a release meeting like this is held...do you know of any other areas in South Africa.
CA	Ja the Gariep Dam does have releases, whether they have meetings, I don't know, I think probably they just talk to all the farmers, because that's all...the only other one I know of.
RT	So you don't know of any other situation where DWAF is involved in other release meetings of any kind?
CA	No, but don't take me as the only source of information here, I don't personally know...nobody's come and shared with me, and said I see you're having meetings here, we're doing the same here, ...no.
RT	OK.
CA	So I assume we're the only one.
RT	That's actually a question I haven't asked of anyone else, but I've not heard of release meetings in any other situation.
CA	Well, I know that the Gariep Dam have quite big releases as well.
RT	So they would presumably have something.
CA	Ja, they must have some sort of system where they decide.
RT	Would you know who I could talk to about that because it might be quite interesting to compare the process?
CA	Well, I would just get hold of Beason again, get hold of Beason and he can help you, see he's my Head Office link, see his section...Operations...would deal with that and he's in the eastern area, so whoever's doing it...maybe he does that area as well, I don't know, I don't know how they're broken up, to be honest.
RT	Ja...I think they do do it by area, because Niel van Wyk is also on the eastern part of the country.
CA	I think they're more...because the stakeholders are known and they sort of contact them maybe and say alright just to let you know that we're going to have this release now, because we have it every year at this time, whatever, I don't think it's a volatile one like this one, where we have environmental people, not that you don't have an environment there, but you don't have the pans and KZN Wildlife and you have all this kind of stuff, I don't think anything comes close to this.
RT	Well, it's actually a unique system in South Africa, so...that's one of the reasons it's so important. That is something that I was going to ask you about...allocations come down from Head Office?
CA	Allocations for...?
RT	Well, say for example there needs to be x amount for irrigation, who administers or decides on that...them or you?
CA	Like when we say there's so many cubes left from the dam?
RT	Ja, who does that?
CA	Well, if there's licenses to issue, Head Office approves those licences to issue so they have sort of like a final say to say no guys, no we won't allow this, we believe the dam is fully allocated. We may have a gut feel...well not a gut feel, we would motivate something and they could say...no we don't agree with you. They would say well then do a study, so we'd do a study and three years later, the study would come out, so that's how it works and in the meantime we're sitting with the applicant going [indicates complaint by applicant]. So it ends up being a bit of a pressure thing, and then the applicant goes to the Minister and then he'll get what he wants, you see, that's normally how it works [laughs].
RT	So what happens when, like Shemula takes off the river?
CA	Ja, they've got a license. We prepare it and Head Office issue it.

RT	OK, and an irrigation scheme, that would be the same thing...off the river?
CA	We...OK well the Act has changed now but basically Head Office still approve the licenses, but we do all the work for it.
RT	OK, so if for example...tomorrow...a big irrigation scheme, like Senekal, or a cotton gin, they've got some money and they want to take a lot of water off the river...what would be the process that would be followed from there?
CA	OK, the first thing that we'd do is request a Reserve, from Head Office...
RT	Well, I can tell you that the Reserve is not going to be around for quite some time.
CA	We'd ask for a new Reserve, we've had a Reserve done, a desktop one, whether they would accept that one or not, I don't know, it just depends on the amount of pressure...
RT	Who's they?
CA	Head Office...where they're going to say OK, no, use that, we think there's enough water still...OK go for it...and if they do then we would say...as I say, my Director seems to think there's about 10000ha available still, so he's happy with anything under 10000ha.
RT	10000ha of...?
CA	Cane, basically, but he'll push his luck and say cotton as well now, you know what I mean...
RT	Well, with cotton you'd get a bit more...
CA	I know, but he would still push his luck and say 10, so anything under that, we would fight and say don't be ridiculous, it's fine, it's fine it's fine...OK, anything over that, we wouldn't agree either...but I think we're speaking the same language as Head Office...100million cubes, we would say is possibly available, if no further upstream expansion takes place, forestry etc....that's what I think, but we're allowing more forestry upstream.
RT	Yes I do know that.
CA	That's water, that's inflow [into the Pongolopoort Dam].
RT	Perhaps it might be worth then getting together with Environmental Affairs, Provincial Environmental Affairs, because they work with DWAF on the SFRA LAAC, well if you feel that way it might be worth getting together with them...there's environmental implications.
CA	Well what was supposed to happen...well this is a bit confusing...what I heard many years ago in 1998, when the new law came in was that they were going to have a similar committee, like they meet for forestry, I mean they go into great depth and detail and they all...everybody's there and they all put in their 5 cents worth, but they were going to do the same for each dam or irrigation scheme, but it never happened, it just ended up Regional tells Head Office that we think this is OK, give us the Reserve and well issue the license, or we'll look at it, it hasn't ended up going through a committee at all, and that's a bit strange because I mean, forestry, although that's obviously affects the environment forever, as far as I'm concerned, you know where you actually plant, but from the water side, that should be quite a quick decision to make...but I don't know.
RT	OK...let's look at
CA	Well can I just say that Senekal's application, Head Office wouldn't accept it initially, we had to fight for it, they said, sorry, it's fully allocated...the dam because they haven't done a balance on the whole dam and they said until we do that, we're not going to issue any licenses, but Senekal put so much pressure on them that they actually just said...aaah, OK, it's still OK.
RT	What happens though, with Senekal's license, now he's taking, OK here's the dam [drawing], he's taking water off into the Mkuze catchment, so it's an Inter-basin transfer, but I don't want to get into that, but he takes quite a lot doesn't he?
CA	Well...he's got a license for 32 million per anum.
RT	Per anum, is that a lot...not that much?
CA	Mmmm, that's that one percent of the dam.
RT	OK, but now obviously not all of the dam is available for releases, so now, we get some forestry in the upper catchment, we've got Senekal, Makhatini Irrigation scheme, there's the water supply scheme, but they're coming off the river, not the dam...and then who else is there?
CA	You mean from the basin?
RT	No, the dam.
CA	Directly from the dam?
RT	Ja.
CA	Well, whether it goes off the river or through a canal, it still comes out of the dam, but collectively those are the significant ones, those are the two big ones...
RT	Shemula...
CA	No, not really Shemula, I don't think they, I think it's probably half a cube a second or something, not even

	that, apparently it's going down every day anyway, so it's not really a significant one.
RT	So they're taking less and less every day?
CA	Ja
RT	OK, so your significant ones are essentially upper catchment development...
CA	Ja, that's a big one, it's huge.
RT	Senekal...
CA	Senekal when he's developed fully.
RT	Mjindi Farmers...
CA	Also small
RT	Sorry, not Mjindi, Makhatini Irrigation Scheme.
CA	Well there's talk of expansion, so they could become more significant.
RT	Well, the Danish ambassador was at the launch of the Agricultural development plan and they've just spent R30 million or R90million or something, whatever, on a [cotton] gin. Now their plan is to extend that scheme to 10000ha of various, sugar, cotton, etc.
CA	But where, is that the old irrigation area or new...because I know they're pumping out the river. Are you sure because we've got an application for 6000ha over here somewhere on the left bank.
RT	Well they had their presentation at Mjindi cotton...I think there's some...
CA	But these guys are supplying to them [Mjindi], that's the idea obviously, there's 6000ha here [indicating an area on the left (west) bank of the Pongolo].
RT	Oh really! Well I don't know who that is but if you look at William Urquhart's map, most of it's here, and then there's a little bit over here, I'm not quite sure exactly, but remembering from his office when I went to visit him ages ago when this plan was being discussed, but I've got the Agricultural Development plan, have you got a copy of it, because it might be worth you having a look at it, but the number that they're mentioning, wherever they are the number that they're mentioning is 10000ha. So, we've got Senekal here, we've got development here [upper catchment], we've got extension of irrigation schemes here...what's going to be left for releases?
CA	No, no but I've done all that; I've got the whole figure on that.
RT	That would be...could I have that document?
CA	No, no it's not a document; it's a thumb suck.
RT	It's a thumb suck?
CA	Yes, we're into thumb sucks into Jozini?
RT	Why...is it difficult to get data?
CA	No, it's just...oh well...during our meeting [the workshop] I've been fiddling with it, OK I'm just trying to see if we're in the same park...um...OK, I reckon, upstream development...OK this is my view, my director may not like this, upstream development, we're looking at already about 300million, that's being taken up, OK then I've got the Senekal permit, that I've got for 30...32million, then Mjindi schema, I've said 3000ha, because they've actually got 3000ha infrastructure, for sugar cane, is 30million, OK, let's just say they do that besides this new cotton, the normal releases which is 10 cubes a second, that's 300million out of that, then annual flood releases are allowed say 200million, but what I've said is between that normal release and the annual flood you've got 500million to actually fiddle with, OK, we can reduce our normal releases, then I've got...I've got a question mark evaporation, it's about 100million cubes, but I've just put a question mark because it's a difficult one to measure, then I've got international obligations, I've also got a question mark, is it 10% of the dam, what is it? Anyway, I've ended up with 900million taken up now, right now, if you're looking at an annual runoff of 900 to 1100, so say 1000million, you've got about 100million left at 100% surety (well 99% for the record), but very strong surety, if you want to put more, then your security, your surety is going to drop, say 70% probably allow another 100million, but you're going to take a bit of a risk on that one, so I wouldn't put sugar in for that, because to replant sugar is costly but maybe if you miss a cotton crop, not the end of the world, because cotton's less, OK, so there are these factors.
RT	But I can't see the Agricultural Development Plan here [in your figures].
CA	Well, as I've said there's about 100million left for that, because we've got, I've said, which is about 10000ha of sugar, or 20000 cotton, maize etc., there's that 100million and that would come into what we're doing now, they've applied for their license, that doesn't mean they've got it hey, I mean if the Minister says no, then...but you see they've put pressure on already, they've said we've got a gin, we've got this, we're uplifting...so what's the Minister going to say, he's going to say yes, isn't he?
RT	So, I mean basically, what's happening here with this development, we're really getting down to...
CA	OK, you see from a technical point of view, the problem with this dam is, it's what they call a 2 MAR dam, the dam is double the size of your inflow, in fact it's three times the size of your nett inflow, at the moment, so that makes the whole thing look a bit skew, because they say that the thing's full it's full of water...so what...and

	you say yes that's fine. But if it starts getting used, and you start to drop, the dam ends up every year say 70%, and then it starts next year at 60% and then suddenly there's quite a serious drought, it goes to 40%, then they're not going to say that are they, they're going to say, whew it's looking low, because they're so used to it being 100%, which is 2 years, 3 years water actually stored there, so they're looking at it through the eyes of good times, of excess times, this is the bottom line actually [indicating hand written figures discussed above], it's a bonus that it's full now, Domoina filled it up basically, so that's the difference, and they don't understand this.
RT	So we have a couple of dry years and this is going to start to look quite scary.
CA	Well...
RT	We're not going to have a lot to play with in other words?
CA	No.
RT	And any other development is obviously going to stress that further, so we're not that far, even with such a big dam, from water stress?
CA	Ja, believe it or not, actually this is the problem, believe it or not.
RT	So, in other words, whatever development that is done is going to have to be done from a very water efficient point of view, like if for example if you've got an agricultural scheme, or something that's losing 30% of the water they're taking off, I mean you're actually getting to a stress level with the dam.
CA	Ja, right now it's OK, that's why people are getting away with these huge losses.
RT	Ja, when's there going to be a bad year?
CA	But that's how things work, things only work when it comes to the crisis time, that's the way it works everywhere, when things start to get a bit tight, they say, Oh, I suppose you're going to have to re-line the canal or something, because we're losing water, you know what I mean, right now they're saying, why repair the canal, there's a whole dam there, who cares and the water's relatively cheap, because emerging farmers get a reduction, so it's like, who cares, that's the attitude at the moment, and it's probably not that bad an attitude to have right at the moment, because the dam's still full and there's nothing happening, while the dam's still sitting at 85 or 90% a year, all you need is a drought though and they're going to cry, that's why for almost 100% surety, we probably don't have much to play with, if you want to start saying we'll take a chance, and they know it's a known chance, you could probably put another 10000ha tomorrow, put 20000, put 30000 in.
RT	But you're taking a chance?
CA	But you're taking a bit of a chance.
RT	Unless you do some serious efficiency work on those existing...
CA	You see it will be covered in our license, it will say that it's 70% surety, so 3 out of 10 years you may not get it.
RT	Well, the thing is it's not always just a question of DWAF being covered, there's development issues and food security issues as well.
CA	But you can save water, there's no doubt about it, we've seen it on the Mhlatuzi scheme, we've done a historical record, from what they've been allocated, they've used half, from day one.
RT	That's good, hey.
CA	Now they're going to lose that half.
RT	Yeah, but if they don't need it, that's OK.
CA	Ja, you see they've had the best of both worlds, they've only been charged for what they've been using, they haven't been charged for their full allocation.
RT	Would they be?
CA	Huh?
RT	Would you get charged for your full allocation, not what you're using?
CA	Ja, we're charging that at Pongola, upstream, that...
RT	You charge for the allocation even if the water's not used?
CA	Ja, if you want to keep it [that allocation].
RT	Doesn't that encourage you to use water even though you might not need it?
CA	No, not really, because it should be close to what it is [use to allocation].
RT	Alright.
CA	I think the Mhlatuzi one is far too high as far as I'm concerned.
	(Turned tape over)
RT	OK, we're back on tape, now what I wanted to ask you, is about local government, I mean, obviously municipal planning requires water, what kind of communication do you have with local government in these areas, how does that work?
CA	Well, there's a...do you mean domestic water?

RT	No, I mean, municipalities, like Jozini Municipality, do you work with Jozini Municipality in any way?
CA	No only that we obviously we allow them to pump water out of the dam and they put it through their purification works, which is actually ours now...the one actually at Jozini, we actually operate that, our community water supply, we took over all those schemes, we're going to hand them back, but in s state that they can actually be used, so we've taken them all over and their staff.
RT	When was that?
CA	Hmmm, happened last...beginning of the year, it may have actually been handed over now, I'm not sure, but its our community water supply.
RT	Was that while the whole Municipal Demarcation story was happening, and no-one know what was going on...
CA	Ja, I think it was about that time.
RT	Because at one stage there was Uthungulu Regional Council...
CA	Ja, but they're all still around, but they've all got different things they do now, I'm not clued up there.
RT	OK, who would be?
CA	Er...well, the boss is Thys Badenhorst, he would be the director, he may put you on to somebody else that works in that area.
RT	You don't have a number for him, do you?
CA	Well, it's our 2700 extension.
RT	Oh, Thys Badenhorst is here in Durban.
CA	Ja, on the 8 th floor, he'll put you on to someone that works in the area, I think it's Dumisane Mhlongo, I'm not sure.
RT	But you as the Control Technician in the northern catchment don't have...I mean do you meet with Thys Badenhorst or anything?
CA	No.
RT	That's quite interesting hey...OK
CA	We're supposed to get around to it one day, but we...at this stage we don't. It's not really an issue there because they just pump, they pump to their purification works, out of the dam, and obviously somebody get charged for that, it's metered and somebody pays for that, I suppose the Municipality pays for that, or we pay, I don't actually know, I think we're going to start paying actually, we've registered ourselves for that, so the Community Water supply is going to pay now, for water use, and there's plenty for domestic, I mean that's first on your list, you know environment and domestic is first so there'll always be for that, so it's like, nothing really happens at Jozini anyway, OK I mean, Shemula pumps separately, and Jozini does supply to Mnonobuya, I think as well, which is pipeline, but its all small, 150ml line or something so it's not a big issue.
RT	I suppose the population is not that big in that area.
CA	Ja, so, I don't talk to them. I know the guy though in charge, I know him personally, because he used to be the manager of Mjindi, that's the only thing, he's the one that apologised for not coming there, heck of a nice guy.
RT	Ja, you know, I was really impressed with the people up there, they're really eloquent and they've got quite a range...
CA	Ja, you know why, they see poverty and they see needs, and it actually starts to grow on you after a while, and you actually think, Shoo, this is like really bad, and I actually need to like, help these people in some way, so they have a sort of a humble attitude to start off with, and they haven't got much good service there in the past, it's been neglected that area, so they've been downtrodden for many years, so that's why they appreciate something being done. That's the way I look at it.
RT	OK, I just want to ask you a few questions about catchment management, you have already answered some of them, but now DWAF is essentially supposed to be responsible for catchment management is that you [Regional] or National?
CA	No, we have a catchment management section here, directorate actually, for catchment management, they've got a few representatives, ja...it's on another floor, I think it's the 7 th floor.
RT	And how do you work with them?
CA	Don't! We don't really work with them directly, I don't, our director obviously knows what's going on, but me, in my current role, don't work with them.
RT	But that's incredible! I mean, Clive, that's incredible, I'm sorry, but I mean you're going up there to Jozini, taking flak at release meetings, and you have a catchment management directorate who you don't communicate with, or they don't communicate with you, or whatever?
CA	Ja, if you turn the tape off I'll probably tell you why...
RT	OK.
CA	No, don't worry, I think their experience, and what they know about the area and that is a little bit

	questionable, so actually I wouldn't be able to get any help out of them at all, they should be coming to me.
RT	But why do you think they aren't? Do you think it's their responsibility or your responsibility to make that communication, or do you think that there should be an available mechanism for that to happen?
CA	It will come, with catchment management, it has to come, because when that CMA is set up, this will be one of their duties, straight away, so everyone's just waiting for them, say OK when that happens, say maybe OK Clive do want a job there, that's how it's going to be, that's the approach, look they're busy, hey, I mean it's not like they're doing nothing because this is the thing at the moment, catchment management, the buzzword, catchment management, so I don't think they're interested in flood release at the moment., they're going to say, well when we've set something up there, we'll look at it then, but Hansman, you're doing OK, you've got Arendse there, or whatever, so carry on, let's not interfere.
RT	So catchment management and flood releases in terms of Pongolo are two separate departments within DWAF...and ne'er the twain shall meet?
CA	Ja.
RT	That is a great pity, but I suppose it's all new, so...
CA	Ja, but as I said, when the CMA takes off then they'll have to realise that this is one of their responsibilities.
RT	Well maybe you'll get some help then Clive.
CA	Oh, I don't know.
RT	OK, so what is happening on the Pongolo floodplain at the moment, is something approaching a catchment management forum...
CA	Sort of, Ja, it's got that flavour to it.
RT	A Water User association, but a whole bunch of different types of users, instead of the same types of users, but it's kind of like a mixture between the two, you can't really put it into a CM forum, but you also can't put it into a Water Users Association.
CA	You can put it into a Water users Association, except, for example, the running and funding of it, how are you going to generate funds, you see a Water Users Association works with an irrigation area because you can levy them, but what do you do here, so either you've got to subsidise it and run is as such or you've got to let catchment management take over the whole thing and say, we'll handle it or we'll dedicate people to it or something like that, we'll fund that part, because it's our responsibility, I'm not sure.
RT	Well, Clive Poulthney reckons it will cost about R120000 per year, maximum.
CA	Ja, it's a project he wants I'm sure.
RT	Well, I'm sure he does but obviously...
CA	Well he can have input obviously, but whether Lubombo WaterWays should run it or not...
RT	No, no, no by R120000 per year, he just means essentially to...
CA	Oh, like to arrange to meet.
RT	Ja, to get people to meetings and do their administrative stuff, R10000 per month, which actually doesn't sound like a lot for R120000 people.
CA	It doesn't, if you think about it a claim could come to millions of rands.
RT	Well, he said R100000 to R120000 a year, admin stuff, getting people to meetings, phones, transport etc.
CA	Could be about right, because you don't meet every month, so it could be like every two months or so.
RT	But basically, to go and organise representation for 120000 people, to come up with some sort of decision, which they are then prepared to take responsibility for, it think that's not a lot of money to spend.
CA	No, of course it's not but then you'd have to pay for the time, for the experts that are running the whole thing like ourselves, or consultants or something, they're not going to take R10000 a month to do that, look I don't know, I'm not sure, no...I don't disagree with that figure.
RT	Well, this is what is would take a stakeholder co-management forum, steering committee, whatever, running.
CA	It's probably true.
RT	So I think that's...
CA	So in other words a subsidy to keep them running.
RT	Ja. OK I think that's pretty much...Oh...there's just one other questions I wanted to ask you...I sent you some information on the Sahelian Wetlands Expert Group who have recently instituted an artificial flooding regime on the Maga Dam in Cameroon, have you heard of that?
CA	Not really.
RT	Well, it's a very very similar situation to Pongolo.
CA	But it doesn't work.
RT	No, it is working.
CA	But you said they all don't work.
RT	No that's transboundary agreements, this is within Cameroon, it's a dam, floodplain, pans...very similar

	situation, and they worked there for 4 years, and they have set up now and artificial flood release system, and people have started to move back into the area. I just wanted to know if you'd heard about it, and if not I'll send some info. OK, I think you've answered all my questions.
CA	We haven't had any disagreements, it's wonderful.
RT	No, well I'm not here to disagree with you, just to find out how we can make this process more efficient. You know, Clive, I really don't believe that there's any point in saying who did what wrong before, I mean we know what we know, now.
CA	Ja, but you see some people have got that attitude, I must be honest, off the record.
RT	You want me to switch off.
CA	Ja.
RT	OK
	Switched tape off.
CA	...I believe, and somebody brought it up, we should have a five, ten and twenty year plan for the floodplain, we need a direction, we need to say to the people, in five years, guys, for example, if they agree, cotton grown within that contour, has got to go, maybe you can make it less for cotton, I don't know, but you need to say, so we will come to you in 2008 and say we're going to release a flood whenever we like, because you won't be there any more, and then in ten years, we'd like to see you established there now, and you know just to have some direction, to have a business plan, put it in place and get it approved, so that anyone who takes over can say OK well let me pick up on this, OK so we're here now on the graph, OK so that should where we are, OK we need to jack that up to get that, and just give a direction with this thing, it's ridiculous now, it's crisis management, like the rest of the country, it's done on crisis, we can't carry on like this and expect people to come in and invest etc etc. into an area, it just causes conflict.
RT	Well, that's the sad thing is that there are people investing in that area, but they're investing in three or four thousand people and there's 120000 people there. That's also crazy, you can't sink millions and millions of rands into 3000 people.
CA	Ja they're just after their own interests, the short-term as well, people say that cotton thing will be gone in 5 years time, it'll be moved to another country, doing its rounds. It's been moved about 4 times, I've heard, the Danish people.
RT	Well, I wonder if the Department of Agriculture knows that.
CA	I don't know.
RT	Oh, just a couple of other questions that I wanted to ask you. How do you deal with unplanned use?
CA	Unplanned?
RT	Ja, say for example you've got an irrigation scheme, like you've got at Ndumu...but now let's say
CA	Historical one.
RT	OK, but now that's a historical one, but now what happens if some guys get together, come along, build a weir on the river or on a tributary of it and start pulling water off, what happens then, who is responsible for that, who goes and says either you can't do this or you need to pay.
CA	No, we're supposed to do that, ja, we supposed to stop it and then say apply for a license before you do this, this is naughty, but I've stopped farmers building dams, I've said not, you'll stop immediately and apply for a license, and they some do stop, but whether they actually stop, I don't know.
RT	But then there's the question of enforcing, policing, finding out.
CA	Ja, but they're supposed to come to us first and we're supposed to take legal action against them if they don't, we have a legal section in Pretoria, and we're supposed to do that, you know what'll happen, we'll hand it over to them, and they'll say, ah right, this is OK. In the meantime, you go and develop and then you say to them, oh by the way you can't have your license, like you're going to say that! You can't say that...and especially if there's emerging farmers.
RT	So really the best way is to get the stakeholders together.
CA	Well, you don't only need a five, ten year, twenty year plan on flooding, you need a five year plan in the area, and say, this is how much cotton we can have and put it there, this is how much...put it there, put the whole thing out and say first come first served, go for it guys.
RT	OK
CA	Or if you're black then you're going to get priority, no...but that's the way it works, I mean first come first served, with the other things in mind as well, with upliftment and all the rest, emerging farmers, we wouldn't allow a bunch of white farmers to come in there as a priority, even if they were first, we'd say, well, hang on over here, there's other, just wait, let's just see what's happening with them, so that's what I mean, but integration, that's what you need there, there's no boundaries here, nobody knows anything.
RT	And no one is sharing any information.

CA	Well this is one of the problems, you have a couple of experts out there, like your Bruwers and your Poultnes and, to a lesser degree, myself who sort of know what's going on but there's nothing somebody else can pick up and say, OK, this is what's been decided on and I'm going to use this as my blueprint now, there's non of that, it's not there.
RT	And it's such a beautiful place.
CA	It's lovely.
RT	My last question, Clive, is just, are there any other comments you want to make, I think I've got all the info, thank-you.
CA	Well, the only comment I want to make is that ...um...what Joan is doing now is a little bit confusing, not totally confusing, but I'm just scared that the people are going to be little confused with her helping with this and creating a precedent with meetings and stuff and we come along in two years time and we're still trying to make up our mind with what we're trying to do, so continuity is a concern of mine, and we're not going to get it from our Regional Director, you're going to get it from Head Office, and Beason must now take up the baton and say, we've started this, we need to commit ourselves to it and continue with it, that worries me and I agree with Joan, she's got a certain project to do and it's more research, but she's getting involved with other things, and she's getting a better idea of idea what's going on that's fine, but she can't do that forever, so the Water Research Commission then must maybe help out, or somebody must help out, you know, to keep the continuity going.
RT	So it needs to be an ongoing thing?
CA	Ja, we have got Poultnes on a contract for 6 months to revive the water committees, but that's another short-term thing...I'm thinking...two years time...two floods time...whatever, if we have floods...
RT	What happens then...
CA	That's what worries me, so something needs to happen there...ja. And the other thing is, I've actually resigned.
RT	Oh, so what does that mean, where are you going, Clive?
CA	Going to America.
RT	Oh are you?
CA	Ja...to Atlanta, oh goodness...as what...well, I think we can switch off now, so it's quarter past eleven, so I'm just going to switch off the tape, and then I'm going to find out where Clive's going.
Interview ends: 11h50.	

Transcription of Interview with Charl Bruwer	
Date: 18 th October 2002	
Interview Starts: 09h30	
At: Makhatini Research Station	
RT: Robyn Tompkins (UNP)	CB: Charl Bruwer (Enviro Action)
RT	This is an interview with Charl Bruwer who used to be with Water Affairs and now is a private consultant. Charl, I just have a few questions. I know that you've worked in this area for some time, what did you do?
CB	When I was with Water Affairs, part of my job was to make artificial releases from Pongolopoort Dam to maintain the downstream ecosystems and support dependent livelihoods.
RT	What do you do now?
CB	Nowadays, I left the Department four years ago. A number of us started a private company, Enviro Africa, doing basically environmental planning and environmental impact assessments. We also do environmental management plans...
RT	So you've broadened your spectrum from water issues, to more environmental issues.
CB	Ja, ja.
RT	OK, can you tell me what your perception is in terms of DWAF processes in terms of effective water management.
CB	Are you talking about the period after I left.
RT	Ja.
CB	It's going to sound funny now, you know, because it may be construed as...er...criticism, but I don't want to actually see it as criticism. I was aware at the time, well when I left, there were problems developing because the whole issue of floodplain use is a dynamic one, and it changes all the time. There were more conflicts...um...the basic conflict came because people started growing crops on the floodplain itself, that actually prevented the annual flooding, crops like cotton that needed five months to mature, you know they can harvest all the way up to May. The other things is also, traditionally, we used to have two floods a year...um...people were forced by not negotiating properly, into only having one flood a year, coming at a time of the year when many of the natural resources aren't catered for. There are groups that just want a flood in September, whereas a flood in September does not serve the purposes of the ecology and the natural products, so that was one of the conflicts that had to be resolved. We were in the process of resolving it, when I left and...er...I did an assessment through the Lubombo Water Ways programme was then established and they asked me to come as a technical advisor on the Lubombo Water Ways Programme, and I did an assessment of the flooding during that period and I spoke to a number of stakeholders on the, the...er...what is the word I'm looking for, on the success or rather on meeting the objectives of what they perceived of a flood, and none of those objectives were basically met.
RT	There needs to be a process but in place to deal with those objectives and there simply isn't. Do you think that's the problem or do you think there is a process, but it's simply not being managed effectively?
CB	I think the problem lies in again, within the Department of Water Affairs, the way that they are now running flooding, there's a tremendous amount of expertise that they could draw on, they are not drawing on that expertise, I don't know what the reason for that is, but the perception, talking to the guys that are currently doing the flooding, they think they are doing a good job, but they never test that perception with the total spectrum of users downstream, when you go on the floodplain and you start talking to those people, you find...
RT	There's a lot of unhappy stakeholders.
CB	There's a lot of unhappy stakeholders.
RT	OK.
CB	So the proof of the pudding lies in the eating, and this pudding doesn't taste too well at the moment.
RT	Ja. What do you think of Catchment Management Fora as a possible tool to address the bad-tasting pudding?
CB	Are you talking about catchment fora in the context of the National Water Act?
RT	Well, ja – do you think that if a catchment management forum, which there is provision for [in the Act], were put in place, it might assist DWAF in dealing with some of their objectives, or do you think its a management tool that's almost impossible to use given the wide range of conflicting users?
CB	Lets rather look at ...you know I don't want to say to you that a Catchment Management forum is not going to work. My own personal opinion and I sit in the Onrus River Catchment, I'm the chairman of the Onrus River Catchment steering committee, and there we are trying to put up a Water User Association, in fact we have gone quite a way, and the way that we are structuring it, is to say that we don't want one user group, like for instance in the old days you had irrigation, we don't want one user group to set up their water users

	<p>association. We want to set up something, whether you call it a catchment management forum...I prefer to call it a Water Users Association, where people actually understand what the function of that water users association is, where the representatives have mandates from their various constituencies, and they can at that level, negotiate about the sharing of water and sorting these conflicting problems out. Now if that would be the function of a catchment management forum, you would have people above the dam and people below the dam, you would also have to strengthen the disadvantaged groups, like water committees, I mean you just have to go down on the floodplain and spend a day on the floodplain and try and do a day's work, and see how much time goes into collecting wood...um... the lack of resources to actually get to places, and people think they don't come to meetings because they are not interested...I mean... it's physically impossible, and unless you create the resources to actually make that thing work, and make massive inputs in the sense of training and that sort of thing, then putting a catchment management forum there, and you don't prop it up and build its capacity and nurse it all the time, it will not work.</p>
RT	<p>Basically you're going to end up with the powerful people and the people who already have the resources dominating the forum.</p>
CB	<p>That is usually the situation.</p>
RT	<p>What is your view of the progress that has been achieved in using these tools in the way that they are meant to be used, that is, getting all the various users of the water discussing in a forum at equal level.</p>
CB	<p>I don't think we have to design a new process, we have to go back to the basic one that worked, which is: Identify the stakeholders Identify what the natural resource use is Identify what other uses there are on the floodplain Look at those that are compatible and those that are conflicting And I'm quite impressed with this workshop, because there are a whole bunch of new players in the field as well, that need to come on board, like the guy from Environmental Affairs yesterday, for years, we have not had any idea of what happens on the floodplain and what doesn't happen on the floodplain, who is in control, is it the tribal authority, is it national departments, is it a combination of the two, and certainly, those conflicts, we have proved in the past that they can be resolved, it takes effort, it takes time, it takes commitment, but I believe that's the route to go.</p>
RT	<p>Also a recognition that there are many of the skills and the knowledge that is required for such an organisation to be successful right here.</p>
CB	<p>Well, I think that is one of the lessons that was a paradigm shift for me when I started working on the floodplain. Actually, you know, people talk about indigenous knowledge and things like that, where you've actually got to put your preconceived idea in the background, listen to what people have to say, ask them what solution would they come up with and you'd be absolutely surprised and amazed at the type of solutions that they do come up with, and the thing about that is you actually get a truly negotiated agreement, which surprises you – you never know what the outcome of a negotiation is going to be, but I reckon as a government authority, if you've negotiated with somebody, the roles and the responsibilities of the parties in that negotiation, must be clearly defined, and you cannot go as a government official and say, "Ja, you know, this goes against my grain", you've got to implement that negotiated agreement.</p>
RT	<p>OK – so where do you think that water control authorities can be improved.</p>
CB	<p>What is a water control authority?</p>
RT	<p>OK – what do you think is making this process so difficult to put in place?</p>
CB	<p>One of the things is that...I believe the expertise does exist, the one thing that prevents the process from going forward is the fact that there's a lack of resources. Certainly you need finances to be able to, and I'm not talking about consultancy fees, I'm talking about getting the right people in place, working through the communities in the form of questionnaires, research, finding out who the stakeholders are, over a longer term and that's why this programme of Joan's, impresses me because there's such a compatibility between the short-term project that we have here, trying to resurrect all the stakeholders and the resource use and the longer term one over which their programme is going to be run.</p>
RT	<p>Do you think the water control authorities can learn a lot from a process like this?</p>
CB	<p>Absolutely, but the one thing is, the very important question...if we've determined what the natural resource use is and we have actually identified those stakeholders and we've brought them together so that they function as a unit, what is their future role going to be, and this is where the water control authority needs to be very clear, to say that we will use that forum, that forum will actually negotiate about the releases, we will supply the resources by either putting a cent per m³ on water or through Environment Affairs or whatever, but some government department or government-private partnership needs to find that process. But it's not for guys to make money, it's just to make it possible for them to attend the meetings.</p>
RT	<p>Especially with previously disadvantaged people.</p>

CB	Absolutely. I mean, you talk about disadvantaged groups, one of the things that I believe on the floodplain is that there are actually a number of...er...I mean, the very poor people are not represented, they don't have a representative structure, the other thing that worries me is that...er...you pick up that there is quite a number of orphans involved, their parents have died. Those kids have no other option but to try to fend for themselves, at the moment they are trying to fend for themselves, so you know, you look at an agricultural programme where these kids can be taught how to plant things that actually do that...food security, and people may say. "Ja, you want to keep them in poverty", but you know, the first step from death is poverty subsistence, from there into a subsistence economy where you actually produce more than you require, I mean look, I'm not a development specialist, but certainly, that intervention needs to be made at a very low level here, before the natural resources are being destroyed – there's incredible floodplain destruction here.
RT	Ja. OK, Charel I'm going to move on to transboundary issues now.
CB	OK.
RT	Clive Poultney mentioned to me that you'd actually worked with transboundary issues in DWAF, in what capacity?
CB	I didn't actually work with transboundary issues, in DWAF, the...um...the transboundary issues were dealt with at, in my opinion, at a political level, through the Joint Permanent Technical Committees or TPTCs as they used to call them. The one thing that we did do was...er...talking...you know, you look at the countries that we're dealing with, Swaziland, Moçambique, even Namibia, Botswana, those places, I had contact with those countries through the SARCOS organisation and their command chain is extremely short, in other words, the guy that works in the field, and often the director of an institution, is also present in the field all the time, so what you find is you get to know a lot of people, Ministers, all that sort of thing, and that communication, that short communication chain gives you the opportunity to find out, what are the problems if you deal with things at TPTC level, and the problems are that they are actually looking at it from a political point of view, but there's no contact with the issues on the ground, the technical issues on the ground, and what the DBSA funded once was in Swaziland, was, we spoke between Swaziland, Moçambique and South Africa, unofficially, not as government officials, we didn't get together as government officials, but we got together and said, what are the problems and are not dealt with by the TPTC and the JPTC and what it transpired was that they actually needed much better technical information on which to base the decisions that they take, because the decisions that they take actually affect people on the ground...
RT	Sorry, by technical information, do you mean...er...technical water information or technical issue information as regards water users?
CB	Well, they talk about, let's just take water, we managed to change the whole new Water Act, where we don't look at water as a resource, but at water as a driver or resources and that is all the things that are influenced by water, that includes the natural aquatic environment, the natural...er...riparian zone, that sort of thing, which is also often your tourism base, also your livelihoods of people dependent on those resources, so how can you at the technical...at the JPTC level do a division of water without looking how it's going to be influencing people on the ground, and that's what we said, why don't we just bring in at a technical level, people that can work together within the various countries and feed information so that at the political level, the decisions is taken in such a way that it reflects what we want to achieve on the ground.
RT	So, in other words, a move away, in terms of management decisions and objectives, from the state level issues, which are often dictated by power relations, to bringing in the sort of bottom-up mentality...
CB	I think, in the old Water Affairs, let's say pre-1990, the decisions were top-down decisions, when Asmal came into the Department, there were a lot more bottom-up decisions. I think it did create problems because you've got to manage...in my mind, it has never been a top-down or a bottom-up – it's a combination of the two, you need to go top-down and see how does it affect...and then you need to go bottom-up, so continuously switching between the two.
RT	So a more dynamic process?
CB	Absolutely.
RT	If you were to look at transboundary agreements like South Africa has signed with various countries in the SADC region, what do you think should change, because patently, they have been generally unsuccessful to date in terms of sustainability of the resource, so what do you think should change?
CB	I can't give you...not having read too many of those protocols, but I've read some of them...it's like the old "shells" that we used to have within SARCOS, you know, "Hereby, the undersigned..." and eventually the whole thing is just a massive spiel of 30 pages and you know, you need to change maybe three pages if you want to change the protocol from Moçambique to Namibia. My big questions is, if you sign that protocol, what I would like to see, if you read through those protocols, there is nobody, no single body or person that you can hold responsible or accountable if things go wrong, those people disappear, and what I would like to see, what I would actually like to see the responsibility and if a protocol goes wrong, or reflects badly, who is

	accountable. If we, for instance, damage downstream livelihoods, does it become a government liability, or does it become a Department of Water Affairs liability, you know, we have funny laws in this country, and we don't actually need laws to sort it out, we just need to acknowledge, that if this thing goes wrong...this is the group or the people or whatever that is responsible and that is the compensation that will be applied. You can negotiate those things before the conflicts arise because then they are in place when the conflicts arise. We do that same thing with environmental management plans, you know, a guy goes into a construction site, he knows exactly if he chops a certain tree down, we mark it, there's a price on it, it's as simple as that, we're not enemies when we negotiate that deal, once he's chopped the tree down and you then start negotiating that deal, there's all sorts of arguments – but if you've negotiated, then you just go to the document, and say OK – R500, that was what we agreed.
RT	OK, what is your perception of the TPTC as an organisation that can effectively manage transboundary waters? Or do you think that the TPTC as a technical committee is the right kind of place to lodge control of transboundary waters ?
CB	Certainly, it must have a place, I can see a place for it, but I think the TPTC can manage, but in order to manage, you need that information on which to manage and the question that I've got is what is the information that the TPTC uses to manage, and those are the things that I'd like to see, if you want to keep the TPTC, then I'd like to see those information management systems put in place so that they can feed into the TPTC.
RT	So, basically, transparency, accountability and responsibility for damage?
CB	Absolutely. And I think the World Commission on Dams, that whole exercise that has been gone through, that creates a whole new perspective within which people like the TPTC will have to look at sharing of water, operation of dams, and that sort of thing, you know and not the old Helsinki Rules.
RT	Not the old...let's keep information to ourselves, but have huge teams to deal with water quality issues.
CB	And the old...the one that uses the water first, he has access to most, it's an old model that one.
RT	OK, Charel, that's all the questions for now, are there any other comments you'd like to make?
CB	One of the comments that I would like to make, is I hope you're outside the government circle, because the issues that you are touching on are, I think, politically very sensitive, good luck for the future.
RT	Ja, I'm going to need it. Thank-you, Charel.
Interview ends: 09h50.	

Transcription of Interview with TJ Buthelezi	
Date: 15 th October 2002	
Interview Starts: 13h45	
at: Taxi Rank, Jozini	
RT: Robyn Tompkins (UNP)	TJB: TJ Buthelezi (POWADETA) TS: Trinity Salagae (UNP)
RT	We are going to begin the interview now on Tuesday 15 th October. OK, um Mr Buthelezi, just a few general questions I want to ask you and Trinity's got some questions as well.
TJB	OK
RT	I just want to know what organisations you are involved with, 'cos I know there's quite a few, POWADETA..
TJB	Yes
RT	And..
TJB	Water Committees,
RT	OK
TJB	Ja, there's Water Committees, and POWADETA is an affiliate to Ubongwa farmers associations, one of the big organisations around here with a membership of 5000, 4 to 5000, between 4 and 5, then we are affiliated to that, then that is POWADETA and the water committees.
RT	So, um, is POWADETA a water committee or is it an agricultural organisation?
TJB	It is...er.. both, because the farmers who are the members of POWADETA, are also the water committees, they control the water, and then that is...in fact they don't control, they monitor the release of the water from the Pongolo...from the dam.
RT	OK
TJB	Yes..
RT	OK – so who does POWADETA..does POWADETA represent different people from Ubongwa?
TJB	No. You see what happened – sometime back we had a problem of water being released from the dam without noticing the people, and then usually the water from the dam flood the food of the people, crop and so on and so forth, until such time as the community came together and organised themselves, the elected me as the Chairman for the umbrella committees, and then the district of, from the top here, to the border of Moçambique and then we organised some five, five from each <i>induna</i> , five members and so on and so on, um to the <i>whatchacallit</i> , we had fourteen committees, that represents the community that utilises the floodplain.
RT	OK, um, and when do those committees meet, apart from at the release meetings? Do the committees meet together?
TJB	Yeah.. they do meet together, you see POWADETA has meetings early this year and then they used to meet sometimes and then now since they are affiliated with Ubongwa they meet frequently, of course, every month, we always talk about the cultural problem, and solve them up, and sometimes we touch on the issue of water and so on and the planting also, almost every month we meet, but usually for those people they used to meet where they are, the water committees, they are water committees who meet maybe once or twice a year, they don't frequently meet unless the water is going to be released.
RT	OK – so it's at the release meetings with DWAF.
TJB	Yes, yes
RT	Is the release meeting the place where you hear that there's going to be a flood?
TJB	Repeat yourself
RT	At the release meeting only...you don't hear any other way.
TJB	No – we don't hear other way. We sit down, maybe sometimes, we as a committee, and I'm the chairman, I organise those people to come together, and then we talk about the situation. You see now, since we see the drought, that – we are facing the drought now – we are proposing to meet, we're proposing to have a meeting and talk and find out if we can approach the Department and ask them to release water so that we can use... use the floodplain, but unfortunately before I do that, while we are still discussing that point, then we heard that there's a meeting that is coming to discuss the issue of the floodplain, then we say, no – let's stop and wait and find out what is happening.
RT	Do you have an irrigation scheme...where is your farm?
TJB	Well it's on the dryland, but there is about 3000 hectares that is irrigated here, at Mjindi.
RT	OK – that's the Makhatini Irrigation Scheme?
TJB	Yes.
RT	OK – and are you...where are you... are you closer to Ndumu?
TJB	No – I'm very far from Ndumu, and yet I'm far from the scheme, because I'm...er...30km from the scheme, Mjindi Farms, so I'm a little bit far from the irrigation.
RT	So – how do you get your water?

TJB	We depend on rain, that's why we want to use the floodplain, because when the situation is so bad we approach the Department, to release the water and when they release the water, they water the area, so that we can go after the water and they flood some things...that's how we live!
RT	It must be very hard.
TJB	Sure, yes it's hard.
RT	And when you do go to the Department...how..do they often release water when you ask them?
TJB	Yes, they do...well according to my experience, ever since I became the Chairman of the...er...these organisations, it's only maybe once or twice, two times, when we ask for water that they turned our request down, usually, when we ask them to release water, they honour our request, that is how...they usually do.
RT	And, when you ask the Department to release water, do you talk to any of the other groups on the floodplain?
TJB	Yes, what we do, immediately when we see the situation that we need some water...er...from the dam, and I to these organisations, the committees...
RT	Is that the water committees and Ubongwa?
TJB	Yes...er...ja. The water committees, and Ubongwa and usually we don't contact Ubongwa because Ubongwa is just come...we just join them, but POWADETA and then we call those people and other stakeholders and we call them together, and we discuss the issue and we tell them how...and we table our proposal that we propose the water because of this and this and this and other people say what they feel about that and finally the person who is from the Department will take the request to the Department and thereafter they announce the day when we need water and then they release the water.
TS	And if the Department refuse your request to release the water what might be the reason that they do so?
TJB	Sometimes we...there was an issue of Moçambique, the Moçambican people did not want water because of their...sometimes they were not released by the time we asked...we needed them, because of the people that wanted to come and fish on the dam and because they wanted to let them fish first, or do what they do and after that, then they only release water later...only those times. We did address those issues, and then everything was sorted out.
RT	Do you ever work with the people at the Makhatini Research Station, because they're doing a lot of farming research, agricultural research, techniques...?
TJB	Yes, they do, we do.
RT	Crop rotation...
TJB	Yes, we do, really!
RT	How often...do you find out what the research is about?
TJB	Yes, sometimes they used to come to our meeting every month, Ubongwa meets every month, and Ubongwa, I said, it's an organisation that represent more than 4000 members, so we meet monthly, and there is a special meeting...now I am from that meeting..and I'm sitting here...so they used to come to that meeting, and sometimes if we need to know some other things, and then always, maybe twice a year, then they organise some...er...organise meetings that we go to at the Research Station and they show us the crops that they are planting and every year they do that.
RT	Does it help?
TJB	Yes, yes it helps us improve, always when, after such an event, the farmers would never be the same. They change from where they were to a little step ahead...that is how we organise to help the farmers.
RT	So, you are happy with the Department of Agriculture. Are you happy with the Department of Water Affairs?
TJB	Yes, at this point in time, we are although there are those things there and there that we need to iron out with them, but in fact you see we sit down now and discuss and whenever we have a problem we sit down and negotiate, and sometimes we come to compromise and that is good, because sometimes we compromise and they do compromise also, so we are happy is its like that unlike the previous committee time, before we formed POWADETA, because when they tell us...they used to tell us they are going to release water even if you say: "our food is still on the field", if they want to release water, they release water...they used to release water. That is the reason why we formed POWADETA, to present out issue to the government, to the Minister.
RT	So you think that forming POWADETA has made your relationship with the Department of Water Affairs better than it was?
TJB	Better, I tell you more better, much better...You see, ever since we formed POWADETA, the water has never been released without our consent. They...from that time when they want to release water, they won't release water if we say no, if we say we want water, then they release water, except those times when... for those reasons [mentioned before].
RT	But your relationship with them is much better,
TJB	Better, much better. I've heard that there are some people that are not so satisfied with that and that, ja people (indistinct), but as far as we are concerned, its 100%, well I think 90% better than before.

RT	Then I've got some news that might be difficult to hear...because DWAF, well the SA government, the Swaziland government and the Moçambique government have just signed an agreement for sharing the water from this basin. Do you know anything about that?
TJB	Well, they did come and tell us...about that, because we had a meeting and then Clive (Arendse) and the other gentleman from Pretoria, they used to come and told us that.
RT	Was that Beason Mwaka?
TJB	Yes. We don't want to dictate, we want to sit down because the issue of water – it's not just a local thing – it's international, because this water comes from our country through Swaziland and into other countries and we want to share everything so according to my feeling, its good that they come to the forum, come to the table and we discuss...only if they will be willing to compromise, where there needs to be a compromise, we will be very happy.
RT	OK. The organisation that is now controlling that agreement is called the Tripartite Permanent Technical Committee, the TPTC and they are starting a big study that is supposed to have started last month. Have you had any visits from anyone from that organisation?
TJB	Never, never. No I think that is something which is gone very bad...something of that sort, because we need to know from the word go. If they are doing that, starting to do that, I can say they are starting to dictate. That is dictatorship...because they are doing something that has not been negotiated, and yet all the people who are doing those things, they must remember that they were voted in, and they can be voted out by the same people if they don't respect us.
RT	This is not Clive Arendse's office, it's the National office and it's now an international agreement, but I just wanted to know if anyone from that organisation had come to talk to you.
TJB	Never, ever, so that thing it hurts me – to hear such things, I don't feel very good to hear this.
RT	I'm sorry to upset you, but the agreement was signed on 29 th August.
TJB	That is bad, that they signed an agreement without coming to us, because it's going to affect us, because we've been living here for a long time, we've been here living under such conditions for a long time, so I don't think someone can come and just say, this will be like this and so on and so forth, they must respect the people who are living here.
RT	I'll tell them of your concerns, Mr Buthelezi.
TJB	Thank-you.
RT	If the TPTC does come to see you, some of your members may have to give them information about water use that may be unplanned water use and therefore may be sensitive information...are you still willing to discuss those issues?
TJB	You see, as far as I think, as far as I feel, everything must come to the table and then we discuss, and see how does it help, or how does it hurt, and if it hurt is, we must tell the people that this thing will hurt us here, and then we come to an agreement that OK, this thing must be handled like this, or like this – everything must change. I don't say we'll accept whatever they bring, but I think everything must come to us and tell us, what is their aim, why do they want to do that, how the new thing is going to affect us and how are we going to be taken into consideration if it has a negative impact. We must address those things, and then we must come to an agreement or some people will have to compromise...I know that they must compromise and we must compromise, we've been living there and we take this place as our land, and we know no other way. When the government came to power we thought that this people will come and help us to improve what we have not to take what we have. You see, the right that we used to have and then we thought they'd come and improve it and make it better for our children.
RT	You do have a legal right [to resources use].
TJB	So you would be happy to assist any water control authority in providing information to them and would you be able to get that to the community effectively?
TJB	As I'm telling you that I am the Chairman of 4000 members and about 40% of them practically use the floodplain right now. No-one will be against changes that come, but provided that they come in the right manner and right direction and not just come to tell use what to do. We must sit down and discuss issues.
RT	Trinity would like to ask you some questions now – I think I've learned what I need to know for now.
TS	Basically I wanted to know about cotton that is planted in the floodplain – do you have an estimation of that?
TJB	Well – we've got a lot of cotton. If everything is alright – though I can't give you details right now – you must come to my office – we are busy putting the records into the computer.
TS	So you do have the records at the office?
TJB	Ja, we are busy taking...still uploading into our computer. In a very short time we'll be having them, they'll be available, but what I can tell you is that if everything, the weather and other conditions are good, we are able to produce up to 30000 bales here and we are growing always. Except when we have a drought like now, but we've got more cotton here, Ja we've got a lot. We can be able to supply our market right here, our gin here,

	without importing cotton, only if we can have the flood, the irrigation, irrigated, we are planting on irrigation, I think we will be able to solve other problems for farmers that are planting cotton. South Africa could be self-sufficient.
TS	There are a lot of floodplain users, there are those that do fishing, collecting wood and farming other things – do you not think that if only cotton is considered, they won't be affected?
TJB	No I don't think they will be affected because you know...everyone has got his piece of land which does not affect the neighbour who is planting vegetables and other things, and then there are those people who come, extension officers and people like Clive, and other people who come and tell us that you've got to plant your cotton so many metres from the water so that the water is not affected, then at this point you've got a new seed that is biotechnology improved, they call it BTEU – it uses far less chemicals and those chemicals that they use are far less harmless, so nothing will be affected.
TS	You say that sometimes Clive comes to tell you not to plant close to the water ...
TJB	That is sort of a workshop and telling the people what is the danger of planting closer and so on, you see because the people who farm, some of them they've never been trained.
TS	So the people accept what Clive tells them, not to plant close to water.
TJB	Hmm, you know if anything, people will never deny anything if you come and tell them rightly, if you explain to me. If you say, TJ (I'm TJ), and you say, you see it is dangerous to use this or this, in a respectful manner, not just coming to tell me don't do this or that, but if you come and talk to me and show me the dangers and the benefits of planting like this, no-one will ever be against that.
TS	Yes, because I've heard you saying that you are working together with Makhatini Research Station about crop rotation, so I thought because BTEU cotton is so profitable, most people are just farming cotton only, don't you think you need crop rotation to help the soil.
TJB	No – we are not doing like you said, we are planting cotton, of course, but we are now busy...crop rotation has been introduced to use and we are working hard on that. There is a new gin here, Makhatini Cotton, the gin. They are trying to tell us that if we farm cotton, then after planting cotton, we can plant wheat or other things like that...we are busy now considering that. We had a problem of rain...if it had rained, most people would be following crop rotation. We didn't do crop rotation for quite some time because we didn't know that it can work and the benefits of crop rotation.
TS	So before the introduction of this new BTEU cotton...most farmers were farming maize and other things are now going to cotton. Do you have any information on people who are moving over to cotton?
TJB	The number of people who are turning from other crops to cotton?
TS	Ja.
TJB	There are many! The reason, there is only one...there is money in this. So now we've got no factory, people are not working, they are not.. and then the cotton has got a market. When you plant it you know where to sell it. And then it produces more money than other crops, and that is why most of the people are coming to this. But at the same time you are negotiating with the government, there were people from Pretoria, asking them to build a mill for sugar cane...and then people support it, because we don't want this land to be covered by cotton only, why on earth... and then the land will be covered with cotton only, an also we don't want sugar can or maize only. We want to have veg, sugar cane, cotton, you name it...we want everything to plant it here and we want the freedom for the farmer to farm whatever they want to farm. I think farmers will help everyone – it's farmers who put food in the shops, and we wear cotton, the shoes you're wearing are from farmers, so farmers are very important, and farmers must be given the freedom to chose what to farm and not somebody come and tell them farm this, or plant this and so on, which some people tend to do!
TS	Ja, but I think in some cases, maybe don't you need regulation that people should farm according to weather conditions, time of year, some sort of regulatory advice.
TJB	I think you're saying what I'm saying – I might be saying it another way, but that is exactly what I'm saying – you know you cannot just think you want to plant peaches here – this climate doesn't take that.
TS	So if a person wants to plant a certain crop, then he wants to plant another...
TJB	He must be allowed to...provided that that crop – the weather, the climate or other things allow that. I don't want people coming and telling me that you can't plant cotton and yet the yield of cotton, it's so high.
TS	OK maybe you can tell me about the problems that you have found related to GM cotton, especially along the floodplain, maybe water-related or soil-related problems. Have there been any problems related to GM cotton?
TJB	Up until this point I can't say we've got any problems, but maybe to say...you know when we started planting this cotton, there emerged other diseases or insects that were not seen previously, it was there, like insects – because we sprayed previously, the insects that were controlled by spraying for bollworm, they are not controlled now – they started emerging when we stopped spraying, but up until now we don't have a problem beside that we need water. With no rain – we've got a problem.

TS	So, I've realised that you don't all plant at the same time, because of lack of equipment.
TJB	That is a problem we have.
TS	So everyone harvests at different times, so the water can't be released.
TJB	Of course, ja, we've got a problem with that, we can't plant at the same time because the number of people are many, and we don't have equipment, so we don't start planting at the same time, but nevertheless, in this area, we've got a longer period, planting period, so now we've made it a point that even after harvest we give enough time to release water, or we talk about other things. You see if you button your shirt and you start wrong, you end wrong so we try to start right and end right...
TS	More especially, talking about cultivation, using a plough – do you have problems there?
TJB	With the new technology that the Department of Agriculture and other companies that are helping us, they've introduced a new no-till system
TS	You are using the no-till?
TJB	Yes we are using the no-till...been using it for three years now and its very good.
TS	So tell me about profit, and cotton.
TJB	Oh – it's very good – I might have my paper here, yes I'll show you – I presented this to Ubongwa – I think I've got my presentation here.
	(Turned tape over)
TJB	It seems I don't have it here – I was going to give you the figures, I was able to make R1000 per hectare – Yes I've got it. (Showed us presentation paper with profit figures per hectare) This is all the numbers, everything, you see R1000 – here it gave me an income of R2750 in 2 hectares, so you've got it all.
TS	I see you are benefiting a lot from cotton, but don't you think that some people who are not farming cotton, there are so many people farming cotton, but those who aren't are not benefiting from the floodplain – are sort of excluded. For example – do you think cattle farmers may suffer with all the cotton being planted here?
TJB	If you plant cotton, then something else, then the cattle will suffer. Only if we don't make crop rotation, then nothing will suffer.
TS	So you haven't thought about what cattle farmers can do during a flood.
TJB	Cattle - we haven't thought about them. Cattle are doing fine, our intention is to feed KwaZulu-Natal with what we are planting so we can keep the cattle off the floodplain – they will suffer but they won't die because other areas – the floodplain starts at the dam and only some areas, there is grazing off the floodplain – some other place like where I come from, there's a big grazing area, but in other places there's nothing, but cattle are living there.
TS	Ja, because I'm talking about during the drought months, like in winter, in the far end of the floodplain when its dry, the cattle come to the floodplain for water...
TJB	Ja we haven't thought of anything to solve that, I don't think so.
RT	Sorry, can I just ask a question there? Are the people whose cattle they are, do they have an organisation that meets with POWADETA?
TJB	You see in POWADETA, we've got every area there – there are five members, one member stands for fishing, cattle , farming, health and water, so those people after meeting us and discussing, they go back to the community and report on cattle, on whatever they represent and they are ...so answer you I can say that yes, we do, they do come to POWADETA and also the water committees have the same.
RT	Are there still fourteen [water committees]?
TJB	Yes – actually there are more than fourteen now – only that usually we...people won't go to church if there's nothing they need, they won't go to the shop if they don't need anything, so if they don't have a problem, they don't frequently meet and go to meet there – only you can realise that open the water today without telling the people, and you'll see more than fourteen committees who are there.
RT	So – when they do meet, how do they get there?
TJB	Oh!
RT	Well, where do you meet?
TJB	We select a place, sometimes at Mboza, sometimes and Mzimeni, then we just select a place or sometimes I used to visit the committees around as the chairman, I used to visit them and revive them and give new ideas and so on.
RT	And do you meet Clive Poultney?
TJB	Yes we do.
RT	Also with POWADETA?
TJB	Yes we do – when we are going to make that decision, we meet Clive Poultney and Zeph Nyathi and his people, and we meet and discuss.
RT	What about the people from KZN Wildlife?

TJB	They used to be invited.
RT	And that's not the release meeting that's a separate meeting, just the people on the floodplain?
TJB	You mean at Ndumu?
RT	No, when you are going to make a major decision, you meet together before the release meeting with DWAF?
TJB	No, but we invite them to all our meetings, when we are going to make a major decision, we invite even the DA, Health, malaria people, we invite them, because water – when it's released, the mosquitoes they come so much, so we call them together to discuss the issues.
RT	And you meet in different places and are there a lot of people at those meetings?
TJB	Yes, depending on how you organise them. As I've said, and I'm going to say it again so you can hear what I'm saying, if there is no problem, you can call the people to a meeting, or church or funeral, but if no-one is sick, they won't go. If there's a problem though, this phone will ring throughout the night, people will ask me what's happening – even people I don't know – they know I'm their chairman, I will sit that time that I've got members here and there and there.
RT	The last time I spoke to you in May, you mentioned that some people were having to walk 8km for water, is that true?
TJB	Yes, it's true.
RT	Are they still having to do that?
TJB	Yes, I think they still do, but now what is that government is doing now – they are supplying the water – there is a water tank that goes along the road. But some places, more than 8km, I think.
RT	And how long has that been happening?
TJB	Ever since we were born, to us it's not a wonder, we don't wonder for that!
RT	OK – oh, there was one more question I wanted to ask you, about the tribal <i>amakhosi</i> , how do POWADETA and Ubongwa deal with them, do you meet with them?
TJB	Yes – what I did when we formed Ubongwa – we wrote our constitution, we took our constitution every tribal, and I introduced myself there, and we are known there, so we work together with amakhosi, we respect them because we believe we are farming on their land so that is that.
RT	So the amakhosi are happy with what you are doing?
TJB	Yes, they are happy, because of something has gone wrong, you'll find the letter from the <i>inkhosi</i> , they are asking what is happening, why is this has been happening down there, because we know that you are there, you say you are POWADETA, that you stand for us, so they are happy.
RT	So you represent them?
TJB	Sure, yes.
RT	OK.
TS	Maybe the last question. You know, sometimes when you go to the pans, between the river and the pans, there's cultivation going on between the river and pans, and there's less fish that the fishermen can catch.
TJB	So far, I've never had a problem with the fishermen, but what I can tell you, I'm saying this that if there's a problem, people will come and say, this thing affects us here and there, we sit down and iron those issues so everyone can feel free, feel that he is at home, but unfortunately, or luckily, no-one has come and complained about the reduction of fish and so on.
RT	Mr Buthelezi, is there any other comment that you'd like to make, is there anything you'd like to see happening here?
TJB	What I would like to see happening, I would say to the people who are concerned, the government people or stakeholders, they must let the farmers have the freedom to farm whatever they want to farm that is suitable to the place, without being dictated to by anything. If there is anything that the people from authority or wherever they come from, that they want to do or introduce, so they see an opportunity, they must come to us and discuss the issue and tell us what is necessary, show us the advantages and disadvantages and sit down and solve them. Main thing – there must be a compromise in anything. We are willing to compromise if they are willing also to compromise. That is what I can say.
RT	Thank-you very much for your time.
Interview ends: 14h30	

Transcription of Interview with Mark Dent	
Date: 7 th November 2002	
Interview starts: 12h10	
At: Netshare Offices, Pietermaritzburg	
RT: Robyn Tompkins (UNP)	MD: Mark Dent
RT	OK, Mark, I just want you for the record to give me some background on who you are and what you do.
MD	I'm a Water Resource engineer by profession, I have a PhD in Agricultural Engineering, specialising in irrigation and water resource requirements for the whole of South Africa and a rainfall mapping (indistinct), those were the two primary areas I was involved in my active days as a researcher, and then managing the Computing Centre for Water Research (CCWR) for 16 years, and the main function there was to develop without any coercive power or reward power, integration between scientists, modellers mainly, ranging across a number of institutions, literally about 80 odd institutions and 10 different departments within those institutions, across all the different disciplines of water...er...we had about...we peaked at about 360 users of the CCWR, it was a national facility, started by myself and six other people, 5 computer scientists and ,myself as a water person, and funded by the Water Research Commission, and then more recently since that closed down, as a private consultant.
RT	Why do you think it closed down (the CCWR), it seems to me to be such a wonderful resource, why do you think it closed?
MD	It was well supported by the Water Research Commission who initiated the whole thing and IBM and then that went well for 16 years where we had to apply for funding in the competitive environment at the Water Research Commission, against other bids for 16 years on a year-by-year, actually a five-year by five-year basis, but then there was a whole lot of leadership changes at the top of the Water Research Commission and the new leadership didn't see a need for it, which was rather sad after they'd just commissioned a R100000 survey into the user requirement satisfaction, strategic positioning of the (indistinct), and it came out with an absolutely glowing report, by all accounts, I can show you the report, it's a big fat thing,...er...I don't think they even read the thing, in fact when I spoke to the CEO of the Water Research Commission as a last ditch effort, it was literally in the last 15 minutes of the interview that she became aware of this document...the interview finished at 5 o'clock in the afternoon, by 9 o'clock the next morning, we had the decision...close!
RT	That's quite scary...
MD	Ja.
RT	It seems to me that that's so much what happens, all these people in different Departments that I've been interviewing, there's so much information out there, and half the time, the one Department is paying for the information, or funding an organisation which is getting the information and another Department or another Directorate in the same Department doesn't even know.
MD	Ja, what led me to a change in direction in my career was that the Water Research Commission, well the CCWR, during its time, was literally the only computing or mainframe, if you like, survey in the country that you could become a legitimate user if you didn't belong to that institution. All the universities, you had to be a member of that university or some very special arrangement, all the government departments as well...um...it was very, very difficult, like getting into Fort Knox, to get into those, so the notion of co-operative governance without linking computer systems is...er...but having said that, the technical issue of linking the systems is only part of the barrier. You then get all the other barriers to cooperation, which come up, and that's what actually led me to do an MBL, which is the other part of my career qualifications which I didn't mention, I started that in 1993, finished in 1996, and that's helped me tremendously in terms of the organisation behaviour side of the whole integration.
RT	Well that's the reason I want to interview you, is that side of things. Where I'm coming from in this project, thesis, whatever, is that without adaptive, collaborative management, you're not going to get sustainable water resource management, and to do that, you need to take a human rights based view of water management and to do that you need to have that change in organisational behaviour in institutions that are managing the water. OK, so that's why I want to interview you.
MD	Right.
RT	OK, so let's just get on to collaborative management, what do you think needs to change about the way water is managed in South Africa.
MD	Well, I think that the first thing was the law, and I really hail the new law, it does have it's detractors, I'm not one of them, I really very strongly an passionately believe in it, I think it's exceptionally pragmatic in its view, and it can really, if implemented appropriately, and we'll get onto that later, it's most exciting, and has been hailed internationally as a leading piece of legislation. Our challenge now is to implement it, and that's where you start running slap-bang into all the organisational behaviour issues and they are substantial, and I think to

	put it in a nutshell, the problem is that there's too much of a functional focus and not enough of a customer focus, to put it in business parlance, that you have a, think of it as a factory making motor cars, and the spray shop is focussing only on the spray shop and be damned with the rest of the system, the chassis shop, only on the chassis and the engine the same, whereas if you look at any successful business, they focus on the customer and those influences come right back into the functional, and we need to focus on the customer. I think that the law does that; organisationally we now have to implement that, with that focus. That will tend to break down, break down, I don't like the word, transcend all those barriers, dissolve all those barriers and those are the fundamental skills we need, to get going.
RT	OK, but what do you think the constraints, the major constraints, the major constraints are to implementation?
MD	Well, it's an organisational change of significant magnitude, it's a major cultural change, culture is a very difficult to change, although Water Affairs has changed from 11 different departments of Water Affairs in the old South Africa, the old white South Africa had something like 7000 staff of which a large proportion were technical engineers, it's changed to 29000 and I think a lot more unskilled workers, so there was an organisational change or transformation of huge proportions and it's laudable that that was achieved in a short time...um...as well as the delivery pressures on them. A further change needs to happen now within DWAF, but also the other departments, Environmental Affairs, Agriculture and others, Mineral and Energy Affairs also need to pick up the cudgels and start working collaboratively with Water Affairs, and it's a two-way street, I think, for all sorts of power dynamics, Water Affairs is quite prepared to keep holding the reins very firmly and the other haven't seriously tried to take the reins out of their hands and into more common hands.
RT	And try to get more integration.
MD	Ja.
RT	You mentioned, the last time I asked you that questions, "fear of losing control", but that's something that I've picked up in interviews with other Departments and even regional offices in the Department of Water Affairs, that there is this unwillingness to let go in DWAF, at the top.
MD	Ja, I think that that's a natural feeling, but I would suggest that the feeling of control at the moment is actually an illusion of control, because the process is going on out there, the process of argument and debate and conflict over water resources is going on, it's just that they're trying to address that with an inadequate framework organisationally, and previously it was legally as well, but actually now the law is there and it's actually been law for the last 4 years, but organisationally, it's not being implemented, so the visionaries who out the law together foresaw this...organisational change that needs to catch up, ad control in a different sense, ultimately someone has to wear the red hat and have the main on-off switch and that is still Water Affairs, however, the process that precedes the issuing of licensing etc must be more open, transparent collaborative, all those good things that are in the Constitution. They are literally as deeply embedded as they are in the Constitution, but they're not being allowed to happen because of this fear of [losing] control and one of the sad things about that is that the players, the stakeholders, from civil society who should be growing up, aren't being allowed to grow up, they're like children who've now reached the age of 18 or 19 and they're still right under the parents domination and they're sitting back...
RT	Well that also perpetuates this acceptance of direction, you know, if you keep telling somebody what to do and they never have to take responsibility for their own decisions, then they're never going to learn to take responsibility.
MD	Absolutely.
RT	And what you get from that, and we've seen it in Pongolo [floodplain], you know, from 1984, well, 1987 to 1996, I think it was when the water committees were working well, everyone was interested, they were all going to meetings, people knew about what that meant, then when that whole process broke down, people just became apathetic.
MD	Ja, and sadly, it even went backwards under the new law, I mean from November 1998 onwards the new law has actually been in place, and things have, in many places, actually gone backwards because of this control issue...I think one of the things with the control is folks are looking to start on a grand scale, if you look at the funding proposals, things for these CMAs, they're huge, very expensive, I mean, if you look at the Mvoti CMA's starting proposal was something like 205 people...
RT	Crazy
MD	If they start small and work up from there, it's lower funding, lower risk.
RT	Well, that's an interesting thing, I went to a workshop for community-based wetland management in the Mkuze catchment, and Di Scott was there from Durban University and that was the very first thing she said, when we were coming up with guidelines, the first thing she said is OK, let's not try and put the perfect solution in place here, let's start with a first step, where do we need to go first...that's a major theme that's actually been coming up through everything is that you really just have to start small...it's like trying to be a grandmaster at chess when you only have just learned how the pieces move.

MD	Absolutely, absolutely, if you look at any human development of this nature, whether business or a game, I mean, the laws of rugby are still evolving and they've been playing for hundreds of years, and...but the basic laws that you can't take weapons of mass destruction on to the field or knives...those are still there, you can't punch the opposition, just the basics and then it builds up from there.
RT	OK, so what would you say then is the most important step, the first step or the first practical step to take, to put something like collaborative management in place, where would you go first, as regards water?
MD	I think that the first practical step is, and this can be rapid, it doesn't have to be over a period of time, is key leadership development, we've got the law, we've got the organisational structures, it's really leadership insights, to see the emerging patterns and emerging logic of clusters and groupings, to see issues like collaborative bargaining, interest-based bargaining, rights-based bargaining, to see the parallel paradigms in other industries and then to be able to lead that process and take some role within your own grouping...really there's been tremendous clustering and grouping and if you look at all the CMA proposals, you see it, there's industry, there's forestry, there's sugar, and they are going to play that role to...I think one of the things that that leadership education would need to see is that also the split between the issue of representivity and advising because there's been a tremendous amount of work done on the whole equity issue as far as representivity is concerned...so it's a round table and there're the appropriate number of places at that table, and everyone is representative at that table, but if you look at the knowledge equity, it's vastly skewed and that, once they start the process it's going to come unstuck on that score, and the leadership insights into that at the moment are very limited and it's going to be a shock to them when they come up with those first insights.
RT	So leadership is a first step to collaborative management, but balancing advice and representivity would be the first step toward adaptive management...an adaptive process?
MD	Absolutely, ja, very much so.
RT	OK, if we can just get on to transboundary issues now, that's where I am really working, how do you think that collaborative management practice can apply across different cultures and ideologies...I mean for example, in Pongolo, one of the major stakeholders there, one of the major issues there, was the fact that Moçambique, you heard it said a number of times at that workshop, that Moçambique didn't want a release, so basically, there wasn't one and those people were very upset at Moçambique, but we're not talking about the users in Moçambique, but now you've got two different government, you've got people on the ground in two different places, how can we put a process in place that can move across that?
MD	I think that one of the fundamental things...it's going to be a learning process, but one of the fundamental things about any learning process, it's a generic issue related to learning, and that is that one needs feedback...one needs to view the consequences of your actions or visit the consequences because they won't always be tangible, sometimes they maybe a vision 30 years into the future. Perhaps to learn not to smoke, one needs to visit the consequences, maybe go and see someone who is badly affected or imagine yourself in 30 or 40 years time...
RT	Sorry, Mark are you talking here about modelling?
MD	modelling...modelling is one of them, ja and in that process, is to see the relationships that build up...I think those folk in Moçambique for example, to quote that example, probably didn't really fully understand the pain and suffering they were putting their own kith and kin through on the banks of that river, and had they known, they would have said, Oh, ja, it'll suit us best if we don't have a flood, but those poor guys...we could stand a flood, we'll just move out the way because it's going to inconvenience these guys. SO I think, even back to individual human actions, often, we say Oh I'm terribly sorry, I didn't realise that that was annoying you or worrying you or getting in your way, I'll move it or I'll desist from that activity, it's only when you know the consequences of your actions, and that you visit them, that you'll change, you may still say well, to hell with you...
RT	But at least you know that there is a consequence that you might not have seen.
MD	And you can factor that into your thinking. And you also, the other thing is that, I think it's very essential to the stakeholder role-players to know that it's an open-ended, ongoing process and the consequences of bad relationships in those sort of things, will sit with you for a very long time, it's not an adversarial process, though unfortunately at the moment, it is, and it's a process which carries on in a very clandestine manner, and I don't think Water Affairs particularly wants it to be that way, but it turns out that way.
RT	That's also something...very much...that I've found is that...well that's the way it is, so that's the way we'll go...even Niel van Wyk, when I was discussing transboundary agreements with him, and I was saying look, I've done an analysis of six international transboundary agreements, and he said [with enthusiasm] well, with this one [Incomaputo], you'll probably find a lot of common ground, and I said well sadly, the analysis has shown that most of them simply don't work, the one's that say we're just going to take a sectoral view, just deal with hydropower, don't work, the ones that say, we're going to allocate this country x amount of water

	and this country x amount of water and we're not going to change it since 1944...1944!
MD	It's rubbish!
RT	The US and Mexico are virtually, Texan farmers are ready to fire missiles into Mexico...Because they OWE use water! Since 1944, I mean things have changed phenomenally since 1944, how can you possibly apply that treaty...the only reference they should be making is...let's see how we can toss that out and get a new one, the 1944 Treaty is no longer valid, is what they should be saying.
MD	And there's you ante-nuptial contract from your marriage, and don't communicate about anything more of any substance, ever again but live happily ever after, you poor devil.
RT	Ja, but it's incredible that there's this well, that's the way it's been,, that's the way it's going to be and there's very much that, well let's not rock the boat, but I mean, the law is completely rock the boat, the new law, so in a sense, why are people not looking for new directions?
MD	I think the bottom line in all this is implement the law. Full stop. Then, it's good...get on with it!
RT	Interestingly enough, when Clive Arendse gave that presentation about licensing [at the stakeholder co-management workshop], and you mentioned that James Perkins said exactly the same thing at the National Water Management Strategy meeting, now Niel van Wyk in our interview...said, the National Water Resource Strategy is where we tell the public how we're going to manage the water.
MD	That's what they were doing...that' what they were doing.
RT	But that' against the law, in essence, that's against the spirit of the law, they don't TELL the public how they're going to manage the water.
MD	You know, it's...that' why I use that simple analogy of the rugby game, that is the lines and the rules of the game, it's not the game. The ref gives a briefing to both sides before a game, they go out there and they play the game, when they step over the line, he blows the whistle and he stops them, he said you did that wrong, I'm penalising you, but in the meantime, as long as they obey those rules, that game would literally go for 45 minutes and then they blow half-time...of course the players would be dead by then...
RT	OK, so what do you think the major constraints to that kind of collaborative process across different cultures are, do you think it's this unwillingness to change direction.
MD	I think loss of control is a major factor, a change of that scale and nature in any organisation, naturally will be resisted, that's why I suggested the leadership thing there, and I'm saying leadership at all levels, to deal with those issues, to get over that, basically business counselling, insight, group dynamics, envisaging, imagining those CMAs, you know you talk to folk now and they say, ah 20, 30 years, it's interesting to see that the time period that they put out for those CMAs, put out that the CMAs will be active, is very closely correlated to their own retirement...
RT	Isn't it just.
MD	And there's this fear that that's Armageddon, and chaos will descend on the place, and I think if they actually go through role-plays and...of the group dynamics and of the sort of issues that will actually come up.
RT	And realise that it's actually supporting their ongoing job rather than being the end of it.
MD	Absolutely, I think it will unlock so much potential, so much innovation, so much general improvement, reduction of stress, all those sorts of things, treating those conflicts in a much more graceful way, but that's not going to happen without any teaching and learning...coaching, that sort of thing. If you look at the money that's been put into so many other things, how much has been put into the human side of things, the humans make or break this whole process...there's absolutely...a complete dearth of that sort of...that sort of real analysis...of...I can't think of a paper that's dealt with the interfacing of the hard science say of modelling with the social process of interaction, very few of them.
RT	Well, that's interesting for me...I come from a place where I don't have to protect my hydrology background or any particular perspective, but I see a lot of that, a lot of people that are very protective of their own particular area of study, and they don't want to look outside that.
MD	Maybe there's a reason for the data being skewed, you know, often, men are engineers and women are more on the sort of softer systems side, and because of the new law, there are more women coming into the water field, but certainly from...in the last 10 years of my working experience, I've found much more understanding and insight in the sort of propaganda that I'm espousing, amongst women than I have amongst men and ja...I would like to think...maybe it's the women who are in the water field are more predisposed to seeing that and that's why I'm getting a biased sample, but it's striking.
RT	Well, I think also, Mark, we're just learning the rules for this new way of looking at things, whereas there's been rules, now men (generally), accept or prefer more of a detailed, set plan, whereas women are more prepared to...
MD	GO with the flow?
RT	...leap into the water...they have to be, traditionally, women's role has been to be more adaptable...
MD	And multi-tasking

RT	Ja, so I think from that point of view, just thinking about how little we know about this field, how little we can... I mean, especially doing qualitative research, there's no real rules, you can't put these figures into a computer and get a level of significance, you've got try... to distil something out in your own way...and it's very subjective, and I think women are more disposed toward accepting something that has come from a subjective source...
MD	Or process-based rather than procedural-based.
RT	Ja, whereas men prefer to have the rules, a way to go, a strategy, whereas women say oh, well, the strategy just has to change because Jimmy got a tummy bug, and really I think children have got a lot to do with it...
MD	Ja I think so.
RT	Sorry, I just need to change the tape.
	(Turned tape over)
MD	I think as we were saying that women are more predisposed to process mode and men love, like a more structured procedure, and I think that the law has actually, the new law has set out the procedure and the lines and the rules of the game, and in-between those rules, there's process, and it's not an either-or, procedure of process, this thing can't run off the tracks, within those prescribed pockets, let go, and let process take over there, and one of the things that led me onto, real insights, breakthrough thinking, one day I was staring at the computer, and I thought, you know, inside that little thing, there's the most amazing amount of duality...control, a freaky amount of control, every bloody electron in that thing is controlled, it's not just haphazard, it knows it's place and it's held there by forces, the clock speed in there is nanoseconds, 10^{-9} , and every little electron moves about there like a little platoon of soldiers or individual soldiers, to that nanosecond clock, and doesn't make one single mistake, and yet, in amongst that, if you look at that from one eye it is unbelievable control, and yet to create that, they must have had control par excellence, and yet enormous creativity. How the hell do you do that with a very large team of players?
RT	And software as well, these huge software programmes that banks write, the Internet, I mean...
MD	Ja, so the human dynamics of that to say...let the process and dynamics are important, but that's not to say let go and let the whole thing just run down the toilet...this [indicating his computer] has revolutionised the world...this, the space industry and the computer industry combined, have given us the vantage point of looking at our world, from outer space, and saying...we're in the dwang, if we don't change, we will extinguish this whole bloody world.
RT	And to do that needs a phenomenal degree of creativity mixed with a phenomenal degree of control.
MD	If you think of the whole life of mankind, it's suddenly in the last 40years, we've got up and been able to see from up there, and been ale to see what we're doing, it's almost a divine intervention, to say...lift us up to the heavens to say...okes, watch it! Now the thing that created that possibility was a human dynamic of awesome proportions that we in the water industry, can learn at their feet, we've got to sit at their feet and learn, humbly, what's going on.
RT	We were watching a programme on Discovery about building the international space station...it's absolutely amazing, I mean it's being built in 150 different countries, by something like 125000 people, and each little piece of it fits exactly, logistically how do you imagine that, how can you even imagine, OK, we're going to have this in space, and we're going to have 125000 people across the globe building it and it's all going to...and we're not going to have a chance to put it together because it's too big to put together on earth, we're going to shoot it up into space at unbelievable cost, and put it together and the first one actually worked...that is amazing.
MD	Ja, one of the later Boeing's the 777 was built by 238 teams in 8 different countries in record time...er... one of the measures that they used when they we're actually physically constructing it was the rework, the number of times you've got to unpick and re-sew the stitches, you know if you're making a car, and say Oh sherbet, this doesn't work or I've got to screw a bolt in here, but I can't fit my hand or a spanner in here, now we've got to do this some other way...was cut drastically, and they did all that by computer simulation modelling, but more than that, that the teams, wherever they were, they knew the implications for others, of their actions, so an engineer was designing a hydraulic motor on the wing to control the flaps and he needed more power, and therefore more weight for that motor, he had to signal those things through to the rest of the guys because not suddenly you had more weight on the end of the wing, you've got to have a stronger wing, bigger vibrations, the whole, literally the whole plane has to change because that one little motor has got to be a few kgs heavier and the minute they start thinking along those lines, an embryonic idea has got to be signalled through, guys, we're thinking of doing this...what impact will it have on you, well probably you can make it up to 3kgs heavier, don't go over that otherwise it will start breaking.
RT	That's exactly like a watercourse, isn't it
MD	But otherwise, without that communication, you go there, you spend 6 months on that, you're chuffed that you've built this thing that now works, you've spent your budget and you go to the party to now put it together,

	and you get shot down, and now...what...you've only got one option left, that's to fight like hell as you go down the drain...so with our water we need to get to that.
RT	That's actually a fantastic analogy, because if you think about it something that happens upstream in a river is going to have those kinds of consequences, so if you can get a system like that, that you do signal those changes through...that's really what we should be putting our minds to...that's what Environmental Affairs, and Water Affairs and Land Affairs and Agriculture should be working together to achieve.
MD	Ja, I was lecturing in water information systems to the MBA class at the University, now I led them through the whole series of lectures...it's 25 hours in total over a number of blocks, and one of my key strategies was to obviously show them the width and depth and breadth of the water system, which are not just what's on the paper, that's data on the paper, the interpretation of that information to human beings before any action has happened, otherwise it's just dead inanimate stuff, and that...all those interpretations are different, depending on where you're standing, so that's one of the key points and the other thing was that there's so much and it's so diverse, that no one group, discipline or organisation can handle it on their own, they have to do it in collaboration, and there are all these issues and by the end they were saying there's no solution, there can't be a solution, this is going to take years and years...I said hang on, as a manager, a leader now, what would you do...you've got two options...you can make a system that will bring all this stuff together, or you can buy one...those are your two options...OK...if you're going to make it, what are the specs, what do you need to make it work...Hmm...that's a problem, if you're going to buy it, you've also got that problem...you've also got that problem, what are the specs of what I'm going to look for...same problem. If I buy it I've got to have cash and then I can get it instantly...
RT	But you still have to know what you want.
MD	Ja, you've got to know what you want, but if I make it I don't have to have as much cash because I don't have to outlay in the beginning, I can do it over a time period, but I've got to have time on my side...and I've got to know what I want. How will I know what I want? Well, maybe I should go and look at what's around, what's on offer. How do you do that with water information systems...maybe there's a country or something where someone has done this before...the problem is you've got stakeholder squabbling over water...to cut a long story short, have a look at the United States, have a look at what's going on there, it's generically the same thing, multi-stakeholder, multi-uses etc., so think, what are they doing?
RT	Have you heard of the Sahelian Wetlands Expert Group? (Story of Maga Dam) They produced guidelines and a manual and are very willing to send out the information, within a week.
MD	This document I'm going through now...[Indicating a Water Modelling Survey commissioned by DWAF].
RT	OK
MD	There was a workshop three years ago, I was one of the invited speakers, I spoke on the range of models available, most people spoke on the model that they were working with, I spoke, was asked to speak on generally on the CCWR, and was asked to sort of come up with, OK out of this whole plethora of models, what do you...so I spoke about with the generic requirements and came up with what I recommended...the process then started three years ago, they commissioned this modelling system from the US, that's used extensively, it's got everything...HSPF, and it basically came from the EPA which was going to institute a whole lot of changes and folks said, ja, but they don't join up, the components, so they said OK, well join them up and make something that works, so that's what they did, but to get back to this process here, HSPF was on the list up to draft form, part of the process was then to get an advisory committee of experts, they all have a vested interest, they're all people who would be service providers and running the models, and they met, (indistinct) and they took the main competitor to their models, which is HSPF and took it off the list, they also voted themselves a 3-year moratorium, which would be inviolate for 3 years and this [the report shown on water modelling] is their reasoning and background on the whole thing, there's not one...in terms of customers, there's not one person from any user group who will be the recipient of this output, they also want to use these models for the whole process of licensing before the CMAs, so the CMA comes in, they get presented with a <i>fait accompli</i> , of the allocation, basically, they call it a compulsory license, it's an allocation, basically, an allocation, there it is for the next 40 years and we'll review it every 5 years and to change an allocation of that length, it's just crazy.
RT	How are the CMAs possibly going to have any credibility with the users?
MD	Ja, and you've spent all that money doing that analysis with tools that are not adequate, because they are too simplistic, because all these things come from little ones & twos, itty-bitty people who are trying to play in the big league basically, and it's not going to cut the mustard. They want comment, well; they're going to get it!
RT	Mark, you've actually answered all my questions so I'm going to switch off now. Thank-you.
Interview ends: 13h00.	

Transcription of Interview with Lorraine Fick		
Date: 15 th November 2002		
Interview starts: 10h15		
At: DWAF Offices Pretoria		
RT: Robyn Tompkins (UNP)	LF: Lorraine Fick (DWAF)	PB: Paul Bouchet (Consultant)
	The first 25 minutes of this interview was not recorded, but it was mainly a general discussion about the participants in the interview, and details of Lorraine Fick's responsibilities and qualifications.	
	Lorraine Fick is a Landscape Architect, who is a senior specialist in the Social and Ecological Services Directorate at DWAF. She has been involved in setting up a Water User Association for water users around the Pongolopoort Dam (above the dam). She is also developing a Sustainable Utilisation plan (SUP) for water allocation initially with a focus on Recreation and Tourism, of which the WUA Pongolopoort forms a Case Study, and is working with a private consultant (Mr Bouchet) on this and other projects. RT discussed what this interview was for and about, and a short discussion took place about the Pongolo floodplain release meeting system. PB suggested that the question being asked "When shall we have releases?" is the wrong question and that it should be "Why should we have releases?", as that is a question that could generate more synergy and understanding between the stakeholders, and create the possibility of a common vision from which objectives can be developed.	
	The recording begins in the middle of a discussion about the Sustainable Utilisation Plan on which Mr Bouchet and Ms Fick are working. The point of the SUP is to use "co-operative governance as a point of departure" to formulate an environmental management framework, within which DWAF will provide an SUP for water in the management area. The discussion that follows stems from a question about the incorporation of social and ecological issues into water management, specifically in the TPTC.	
PB	The other thing, also through the SUP that's compiled for the area, clearly moves the emphasis away from managing input, to actually managing output, is that, you can have a committee that now no longer has to actually manage the inputs, so they don't have to worry about who they employ and how many cars and what are they doing, they can actually manage the output through contracts, so that, you know, when it gets to tourism, or when it gets to utilisation, it's all being done by the private sector, and you've got your criteria against which to measure, so you can put out a tender and say, we're looking for commercial farmers to exploit water coming down the canal and we've got we're willing to talk to them. Then you're managing output, because you're not managing any more, you know, you don't have to physically worry about all the inputs.	
LF	But that's specific to the project, yes, but, you know the TPTC is not the only transboundary cooperative mechanism that exists, and I think getting them to incorporate social and ecological issues will be, for the Department, as a start to accept a proper balance in environmental policy, and then to ensure that these arrangements are reviewed and its representation, and the aspects that they consider when they are liaising with each other and making decisions, and I don't know, I think it's on an ad hoc basis that's it's happening now, but I think that it will change with the implementation of the Incomaputo agreement.	
RT	So at the moment, it's [the incorporation of social and ecological issues in water management] filtering up through our, in South Africa, through our Department of Water Affairs.	
LF	I hope so. That's the idea, but I think Valerie [du Plessis from Environmental Affairs] might be able to tell you more, but that is the idea with the initial starting up with sort of DWAF's mother policy or plan, the requirements for an environmental discussion for an Environmental Management Plan, and that then coming through into implementation through their [DEAT] environmental management plan that they're now developing, and what are the aspects developing in environmental policy that's accepted by the Department, and then also as one of the outputs of the policy...or implementing the policy to ensure that all co-operative...um...international, internally, is reviewed in terms of the specific issues that they need to address. When that's going to happen, I've got no idea.	
RT	Ja...	
LF	Oh, usually environmental issues are addressed on an ad hoc basis, you know, as I said earlier on, you know, by them supplying us with documents, and I think also, you've got to...Social and Ecological Services relationship to the entire Department [of Water Affairs], now is with a focus on Water Resource Management, delivering a service to them, and it's...the change in where we're going to sit also needs to be considered in terms of the effectiveness of all these policies that we're implementing at this point.	
RT	So, at the moment, you deliver a service to DWAF, to the Water Resource Management component or directorate.	
LF	Ja, well the idea is that there should be an environmental service to the entire Department, you know, covering Forestry, Water Services and the Water Resource Management, whether it's going to be this section	

	or whether each is going to look at their own business, the restructuring at the end of the day, will say.
RT	There's a restructuring?
LF	Yes, do you know about the restructuring.
RT	No.
LF	Water Affairs is restructuring completely in order to ensure implementation of the mandate of the various acts, they are at this stage, they are the most far developed with the Water Resource Management branch, but they're putting up Forestry, the Forestry section and certain parts of the Water Services component as well and they are really looking at the functioning and the organisation of the Department completely...um...who's got...who's establishing the documentation, Barbara Schreiner. And also, I think through that process, Water Affairs will re-look at what needs to happen to its components and re-looking at their role.
RT	Do you work with the Catchment Management Directorate?
LF	Ja, to a certain degree with respect to the implementation or the institutionalisation component of these Integrated Environmental Management plans (indistinct) and that's about it at this point in time.
PB	That directorate is responsible, the CMAs is just one of the institutions available and obviously, on the ground level in the SUP, the institution to run that plan is just within the catchment, so you could have several WUAs or management committees or catchment management committees reporting to the CMA at the lower level, but they're not yet in place and then they would report direct to the region, to national, so they do work closely together, they work very closely together, I mean even in the structure, the institutional structure, we have to work with that Chief Directorate to how the things all fit together.
LF	Just to give you an idea of the relationship between Water Affairs and the institutions on the ground. Say for instance, for the floodplain, they might look at a series of WUAs to manage the resource at a local level, and then they have...they are basically accountable to what they are now calling CMAs which are slowly being developed and then the CMA will be reporting to the Regional office and then DWAF Head Office will have a policy regulating function...um...and the regions until the CMAs are established will have that linking responsibility, with the organisations on the ground and the establishment of the WUAs and CMAs and maybe at a later stage the water services authorities...
PB	Agencies, catchment management committees...
LF	Ja, committees and so on, is done by that Directorate, Catchment Management.
RT	Now, what's happening though, is licensing and allocations are being done before that...
LF	Ja.
RT	Now, how are you involved in bringing social and ecological issues into what gets licensed?
LF	We are, one of what they call...
PB	Lead agents...
LF	Ja, we're a lead agent in terms of the Recreation and Tourism water-based industry applications, so we will be...we're taking responsibility for policy development, protocol development and then also recommending approvals to the dedicated authorities, which is I think the Chief Director Water Use and Conservation, that actually signs the licenses. The licenses in most cases are received by the regions and then they are distributed to the relevant people in each directorate. Now our inputs into the other water uses that needs to be authorised, we are requested to comment and if necessary and then to add any license conditions which need to be added to the license, so we comment on say abstraction, these are the possible environmental impacts that needs to be considered in the process that the applicant needs to go through in order to consider the impacts associated with the development and then we will recommend a process associated with that, mitigation measures, conditions that need to apply etc.
RT	And that...you look at that license separately...that must be...
PB	According to Section 21...
RT	Sorry, the point I'm trying to make is that if you've got an area for which you have an SUP, but licenses have been approved over here, over here and over here (indicating small areas within a larger area), how do you deal with that situation?
LF	OK, I understand. With an SUP, the development or sort of the planning for use, specifically for tourism and recreation is done through a process, so you identify the concessions...that...or the licenses that need to be given out at the end of the day. So for the Pongolopoort dam, we've identified the...
PB	Not we...the stakeholders...
LF	Well, the process...the stakeholders identified that there would be 10 concessions, considering competition, market competition, viability...
PB	Ja, that's a Treasury requirement.
RT	Sorry, when did they come up with those 10?
LF	Through the planning procedure, they identified that there's 10 opportunities.

PB	Ja, in terms of the planning procedure, well there we actually looked at certain objectives, one of the objectives was that it must be economical, if you have too many, then they cut each others throats, and if you have too few then there's not enough competition, I mean it's not market related, so we actually in that case we went and we sat with the various stakeholders and we said, well, you guys are here at the dam, you guys are either managing...
RT	Are we talking about at the top of the dam or below the dam?
PB	No, at the top.
LF	They are the definers of the process.
PB	Ja, they identified for the Pongolopoort Dam...10...
RT	Sorry, is this the WUA that you're dealing with?
LF	Ja, the plan, the establishment of that. There's ja, OK, just...the SUP was developed by the Department initially, the outline, then they approved that we do a series of pilots. Now the first pilot was for the Pongolopoort Dam and there is a result available now...I think I know what you're getting at. Yes, they are looking at strategic environmental assessment as a tool to, say for instance, identify opportunities in catchments, and they've done one, I think with the Mhlatuze, they've done an SEA on that to identify what is available in terms of water for allocation and there's also a Directorate called Water Allocation Planning that will then take responsibility for doing these SEAs, strategic assessments to look at allocation...ja.
RT	And presumably then there's some mechanism to work with DEAT or the Provincial Environmental authorities?
LF	Ja, then you've got that sort of bigger process, looking at what can be available and as licenses come in, you know that what you've already given and what is still available, and then they've got, sort of, as individual applications come in a certain process associated with that. This is the document, it is available on the net, but in there, you get an indication who is responsible for what licenses or water uses and who...
PB	Ja, they're all based on Section 21 of the act, they've identified various water uses from a to k
LF	Abstraction...
RT	Ja, I know them...
PB	Ja, so out of that, so depending there it depends on what is being applied for, and that would go to a specific department that really understands that and then leads the application.
LF	Ja, asking for the necessary studies that need to be done to make a decision, or just consulting certain parties as to the conditions, and in the document you will see, like for instance SES (Social and Ecological Services), they will indicate that SES only, needs to be consulted, or you will need to do and SEA or such as whatever the case may be, ja, it's in here, you'll see.
RT	What I wanted to ask is how you thought DWAF could improve the CMA process, it's a very complex and difficult process...
LF	The establishment?
RT	Ja, having worked on an SUP for a WUA...how...?
LF	Ja, I can give you a perspective on that. The normal route of establishing a WUA is that the institution is established and then they go and do a business plan. We are working...and that takes a while, and then they've got to go and do public participation and all of that, that and that...and that takes time as well, so what we're doing is that we...in our specific situation, where you've got to look at the development of the recreational industry or the tourism industry is that we take...we turn it around. We, through the planning procedure, you look at what needs to be done how, where and by whom, and then you kick out with an institutional proposal, with already the backup of a management plan and including already the public participation process.
PB	There's no point in creating a body for managing if they don't know what they're going to manage, then once you've established it then you realise that they shouldn't even be doing that.
LF	Ja, so...but the catchment management process I have got no idea. Derek Weston would be the guy to talk to on that.
RT	Ja, I'm not really going into that process, I just wanted to get your ideas on incorporating social and ecological issues into it.
LF	Ja, catchment management agencies, I don't know, but on the local level, they need to really look at streamlining, because they might sit with this big WUA with a lot of members not needing to do anything, so rather...
PB	And also, who are the key members that should be there to manage the resource sustainably, because often you get people that are not really...they might be interested, but they feel that they are...they should be represented, now there are mechanisms that the affected people must be represented on the WUA, interested people must have a mechanism to communicate with the WUA and this is what we're looking at because many people...we think at Pongola, people say that they are affected by the dam, but you ask them where do

	<p>you live, they say 30kms away from the dam, so you say OK, 30kms, but what's the difference between 30kms and 300kms, or anywhere, I mean there are people that are interested, and there's a big difference between an affected party and an interested party and...because you could have affected parties sitting halfway around the world, an entomologist that studies certain aspects of the Pongolo floodplain is probably more affected by flood releases than a guy who lives 3kms from the floodplain...so one person just geographically happens to live in the region, that's where he lives, if he was given the opportunity he probably wouldn't want to live there, somewhere else where there's better water and stuff like that but he happens to be geographically placed there, he's interested in what's happening, but he's not really affected by it...there's are aspects. The guys living in Empangeni, with all the boats going down to Ponta d'Ouro, that drive through the floodplain, he's just as affected as the guy that's half a km from the border post, because his petrol station is affected by the people going to Moçambique, so it's being able to identify who the key stakeholders are, they should serve on the WUA, and clearly mandate as to what the roles and responsibilities are and the relationships that have to happen. If you've then got enough clearly defined WUAs in a catchment, then the CMA has got the coordinating, umbrella role, to coordinate between, but you work the other way around and it's very difficult because you create a CMA and you don't know what they're actually going to be doing later, so it does create some problems.</p>
LF	<p>Within that...especially the social...the person managing the social side of things is the plethora of the little institutions managing specific user components and you see that the one thing that we would like to see happen is that the government departments in specific areas should start consolidating the community organisations or whatever the case may be...</p>
PB	<p>Those on the ground...</p>
RT	<p>NGOs etc, all doing different things and nobody knows what, so everyone just does their own thing.</p>
LF	<p>Ja and I think that affects also people's interest and willingness to cooperative in these types of things, they're just sick of it.</p>
RT	<p>Ja...well if you consider that...if somebody is say, a farmer on the Pongolo floodplain is going to be involved in an institution like this say the Water Committees, I don't know if you know about the structure of the water committees...now he has to give up a day of working in his fields, he also has to get there, now somebody's got to pay for his transport, because he's not going to pay to go to a meeting...</p>
PB	<p>They're not affecting him directly, it affects him negatively because he's got to give up the day, but he's got to go and sit and negotiate things that are of interest to his neighbour, and his neighbour's neighbour, now he's got to give up the time to go and do it, not that is where the problem comes when you start talking about "The Community". If you've got community structure, in North West]Province], we've worked with structures, now these are public assets in terms of Pilanesberg, Mabikwe, these are public assets, how they communicate with the communities through existing structures and this is where we've got to recognise the role of existing structures. There are ways. If I want to go and communicate with the people on the ground in the community living adjacent to Pilanesberg, I don't go and set up forums in each village and then get the village chairmen all to get together, I simply go to the Tribal Authority and say do you have a Tourism committee or do you have a Heritage Committee and they say, yes, quite conveniently we've got a committee in place, and I speak to the committee and they distribute the information, I get my results and my answers, whereas, most of the planning is being done without taking into account the role and the efficiency of the existing structures that are in place. Now in Zululand, you've got a problem because you've got Tribal Authorities and political structures</p>
RT	<p>And there's a bit of tension between them...</p>
PB	<p>Yes, there is tension between them, but there are ways of communicating, and this is what I've seen on the floodplain, you're getting many problems is because you're getting people that are, basically creating bigger division between Tribal Authorities and political structures, because it suits them.</p>
RT	<p>Because a project will use a political structure which then alienates the Tribal Authority or the other way around?</p>
PB	<p>Ja, so it depends which way you want to go with it but there are structures and these structures have got mechanisms...through the local government, local government does have communication with the Tribal Authorities and they've got representatives and chairmen and stuff...so by going down there and saying OK, I want to have meetings with the Tribal Authorities and I'll have meetings with the Civics and I'll have meetings with political structures and I'll have meetings with the local government, basically what you're doing is you're creating division and by dividing, you can rule them and as consultants it's quite easy, the more you keep them separate the longer you can continue with your consultation, and you're not going to get to the answers, that's the big thing is that 15 years and lots of research that's happened on the floodplain and no results, simply because people continue researching and what's happening is that...there are structures...but you've got to recognise the structures, like we did this morning when we spoke about the upstream section around the dam. How does Water Affairs communicate with people on the ground around the dam, there are</p>

	structures...you work through your local government, because without local government you're not going to have the political support, or the support of provincial or national government. Without helping local government formalise a relationship with the community, you're not going to get your answers, so there are structures, and then formalising the protocols and procedures so that people can start working together, because I think too much work...there's the situation where we are dividing the communities, we are dividing structures...and NGOs...like Namibia, every community, I was shocked to find, when I did research up there, that you go into communities and now, this community belongs to this NGO and this community belongs to this NGO and you say why and they say well obviously it's got to do with sustainability of funding, if you can continuously work with one community and show good results, you can continue to fund it, but it doesn't mean you're solving the problem of the community, they've got nice four-wheel drives, they've got lovely vehicles and stuff, but the communities are not benefiting from it and that has got to change so that the structures can be put in place, the mechanisms can be put in place to start working, because there's too many structures on the ground.
RT	Well that's another thing I wanted to ask you...speaking of structures on the ground, how do you work with the SDI?
PB	Well, we brought them in as one of the stakeholder groups, they are one of the stakeholders and represent a body, we brought them in on board.
RT	In Pongola?
PB	We invited them to the workshop...
RT	Did they come?
LF	No, no, not necessarily invited, we made sure that the planning side was incorporated in what we are doing.
RT	You know, it is impossible to get hold of them.
PB	Ja, it is...I know there's...
LF	Alex...what's the guy's name?
RT	Andrew Zaloumis...in fact they're not called the SDI any more, they're called Trade and Investment KZN.
LF	(Laughs)
PB	Well, you see, they've got a specific role.
RT	What role is that, I'd like to know?
PB	Trade and Investment, DTI [Department of Trade and Industry], the whole initiative, where it came from, freeing up the border posts, creating the infrastructure, that's not their role to play and they've done it, they worked on their reports and they wrote up in books, and the investment is coming in, I don't know how much investment in terms of private sector investment, not much, but I've picked out that...
RT	Actually what's happened now is that they are basically concentrating all their efforts on the Greater St Lucia Wetland Park, a site in Ponta d'Ouro and I think there's another site in Swaziland, it's...anything in between, infrastructural development...
PB	Ja the road...
RT	There's a road that goes to the Kosi Bay border post, but it's not from Ingwavuma because I've just been on the Ingwavuma road, so it must be about 60kms from the border post and as far as I know, the road construction up to Maputo has not been built...I mean it might make your job a bit more difficult...
LF	Ja, sure, but we did what we could, as far as possible to get them involved, but we made sure that whatever documentation and training initiatives was included.
PB	It was included in terms of the identification of nodes, they did identify areas, but it is a difficult...
RT	Have you had any feedback from them?
PB	No.
LF	We distributed documents, but nothing...
PB	No feedback, the information went out, they're on our mailing list, they get all the information, they don't...you know, in terms of planning, there's a legal requirement of affording the opportunity to participate. In the event of them not participating, at least, legally, that has been covered. Nobody can say, you didn't afford me the opportunity, as long as they've had the opportunity, and it's not just SDI, often we've found that...local government comes on board at the end of a project and then they say why haven't we been on board from the beginning of the project, but we've invited them...there's our mailing list, you were invited, we sent you the papers, you don't arrive, doesn't mean we haven't invited you, if you don't respond, that doesn't mean...we going to accept that the invitation has been sent.
LF	You can't stop the process, I mean to a certain degree you can try and accommodate them, but jislaiik, if you stop and go back...
RT	That is often the problem though, with local municipalities, is that you do invite them, but there's such a lot of restructuring that half of these people have only been doing that job for two months, they've only been in that

	region for two months.
PB	So I think you do have a problem trying to get them on board, but once again, it's creating the mechanism that, when they do decide to come on board, they can come on board, it's not that they're left behind and you don't have to stop the process...the...they could stop it, I mean there are processes that they could say no, you put pressure on them, when you go to court, you can go to a tribunal and you can make sure the process will go ahead.
RT	But, I mean if local government and the people are happy with the process, they're not going to want to stop it...
PB	No, just keep the process going, it's critical that in the planning process, the method of planning and the procedure of implementation must be legally sound, your paper trail must be clear, the invitations must go out, your mechanism of communication must be in place, so that nobody can turn around and say, I haven't been consulted, I wasn't afforded the opportunity...if you can prove that that is happened, then the process is OK, because the process is more important than the product.
RT	Ja, because essentially, what's going to happen is, people are going to get more and more involved in that process, it's going to
PB	...a groundswell.
RT	Ja, because, people, certainly people in Pongolo, that whole Water Committee situation was working very well when it was driven by somebody with...I mean...poor old Clive Arendse...he just had a great difficulty taking over from someone as motivated as Charel...who had done it for so long and things had been working well.
PB	Process...that's the problem, if the process was clear...
RT	That's exactly it!
PB	But in terms of the personality-driven, you're not process-driven. The process could've...I mean, 'till today, Charel could have done things his way and I mean he had his methods, and Clive's got his ways and methods, but everybody's still asking the wrong question. If it was quite clear that these are the guidelines, these are not negotiable, ecological criteria are not negotiable, because, I mean, the fact is tilapia breed, they spawn at certain times of year, grasses and stuff, these are important things that are not negotiable. Any scientist can tell you that if you get a flood of this duration, these grasses will grow, and of this duration then the fish will start spawning and migrating so you dos tart picking up certain givens and those givens is what should drive the process...not people, because, anybody should be able to drive the process, if there's a communication methods, if there's...
RT	Well, if it's a system.
PB	If there's a system and if it's based in sound principles, not negotiable, many ecological parameters are not negotiable, because if a community says, we decide to hold the river in its ecological condition or we're going to make this a working river, we're going to put weirs in we're going to dam it, we're going to pollute it, then they make the decision so they live with the consequences.
RT	Well...on a river like Pongolo, they don't necessarily live with the consequences, Moçambique does.
LF	Ja, but that exercise, deciding on our objectives hasn't been done...so the whole thing has been just perpetuated by not putting the process in place.
PB	Ja, because over the last 15 years, the process has been, "When do we release water?", that's the process, it's the wrong process...they must ask the question "Why?", "Why are we releasing water?", and then the process...then your subsistence farmers will be able to tell you why they want water, like you drew the picture earlier of why, we need fresh water, we need flushing of the pans, we need biodiversity, we need cotton growing, we need jobs, then you can prioritise and start categorising your needs along the entire floodplain. The very first step, after looking at the encumbrances, the encumbrance survey is, what are we allowed to legally talk about, the Minister of Water Affairs may not talk about land tenure, he should refer that to the Department of Land Affairs, because that is one of the ways of unlocking the potential, if we look at it classically, the Minister of Water Affairs should talk to the Minister of Land Affairs and say, if we ensure security of tenure to the individual farmer, then the individual farmer can go to the land bank and get a production loan, because he's got security on the land, that means he can by a canal to get the water to field edge, but the Minister of Water Affairs may not deal with that.
	(Turned tape over)
RT	Ja, OK, I understand that, but, with the greatest of respect, Water Affairs is taking all the flak for what's going on down there at the moment, so how do you think that would be best addressed? I mean, it might not be entirely your problem but DWAF is taking the flak, so how do you think that can be addressed?
LF	But the thing is...to a certain degree, they are still just addressing the release, they're not looking at integrated management and from that basis, by really looking at an integrated management plan, you need to really start talking to the relevant government stakeholders.
RT	That's what they did for the first time at that workshop, agriculture was there, environmental affairs was there,

	but they were launching the Agricultural Development Plan next door, and they weren't there.
LF	Exactly, but also then to get ...the decision within Water Affairs needs to be taken to follow that route. Then only, you know, a kiepie like myself can actually do something concrete, mandated through the management structure, but we'll see how that is going to pan out, as I said...
PB	Ja, you're sitting with...Water Affairs is going to have to sit and say OK, we're going to have to recognise the authority of Provincial and Local Government, firstly, so that, in the interests of co-operative governance, real co-operative governance, we can start working together because we agree on what we're going to take decisions on, then the Minister of Water Affairs can say, this is my authorisation procedure the application for water will be handled in the following way.
LF	Ja, because the whole thing is, the idea is that government should start working together on specific issues and specific areas, and that is as far as I can gather from what most of my managers said that that's what we're moving toward but it's not actually happening on the ground, everybody still keeps to their business.
RT	Well, it's not actually happening in Water Affairs even. The other question I did want to ask you is a guy called Mark Dent, who used to run the CCWR for 17 years, he's now a Water Resource Planning and Organisational Development Consultant, but one of his suggestions about what one of the major problems with stakeholder co-management systems is, is that, to paraphrase Mark Dent, when you have, especially in rural areas, a stakeholder co-management, whatever kind of organisation it is, you have...equity in terms of representivity is fairly easy to achieve. Equity in terms of knowledge and input is very difficult to achieve. Now that obviously falls very much within your sphere of operations. How do you address those questions, the question of knowledge, input, confidence to input...equity?
LF	I am not exactly sure, but I sort of...what I've come across is this whole training participation thing that needs to be done, how to actually do it I've got no idea. I think that Jean, just down the passage may be able to answer your question, but I think...maybe in your experience [PB], not necessarily water-related, how do you deal with the different levels of knowledge and skills.
RT	So that you have an idea of the genuine input, the genuine idea of what the community actually want.
PB	What we did in...we did a project, well, we're busy with a project in Pilanesberg, which has got to do with the Heritage resources inside Pilanesberg, now next to Pilanesberg, inkhosi Pilani (indistinct) of the Bakgatla Bagophela, of a community, it's a Tswana clan, and they have got a lot of intellectual property regarding the heritage resources within Pilanesberg, I mean they've been living there for about 300 years and when we got to the structures of how is the community going to play an active role in terms of managing the cultural resources within the National Park, that's a good question, there you've got 29 villages, there's a lot of people living outside the park, with vested interest and a stake in what's happening inside the park, and everywhere we went we spoke to the elders, the ones that have got the knowledge, the custodians of the knowledge and they had their...and their relationship is not with the community but with the structure within the community where the knowledge is based, the value of traditional knowledge, that structure formed a relationship, advisory relationship with the park, directly on management, so they sit on the management committee to talk with the managers, so they've got the knowledge that is required to talk...but to manage the benefit flow emanating from that relationship, because there there's concessions going out to run the Heritage Hotel and the Heritage Lodge, so that's a commercial concession, which the community gets equity, because they're putting in the intellectual property and the Reserve are putting in the infrastructure and the two form, and the resource then pays the private sector to unlock the potential, the money that flows back doesn't go to the committee, it goes into a development trust, and that development trust, the foundation, has got it's trustees and they can take the decision of how to spend the funds, and they are even afforded the opportunity to make the mistakes of how they're going to allocate the funds, but not the management of the resource, so the management of the resource is separated from the benefits flowing from the resource, and in that way, you can actually overcome that specific aspect.
RT	OK, but that's within a fairly homogenous community, OK let's say, now we're looking at the Pongolo floodplain, I'd like to stay there if it's OK with you, and what you've got is, first, Ndumu, here, that's a stakeholder, then you've got a whole bunch of essentially subsistence farmers, some commercial farmers, who are very poor people, who often get water from the river because they can't afford it at the supply point, and sometimes there aren't any and they have to get water from the pans, now there's nothing wrong with their knowledge of the area, they hundreds of years have interacted very closely with the natural resources of the area, they understand the processes of the river, not necessarily to a scientific level, but to a level that is certainly good enough to contribute to the management of the area...
PB	They know where to build their houses, where they won't get flooded.
RT	Exactly, indigenous knowledge though it's a difficult thing for us to accept and understand because we think we know so much,, but actually we know little by comparison with a person whose family have lived there for 400 years...when they come in to a stakeholder meeting...I've seen it happen at Pongolo, they do have the

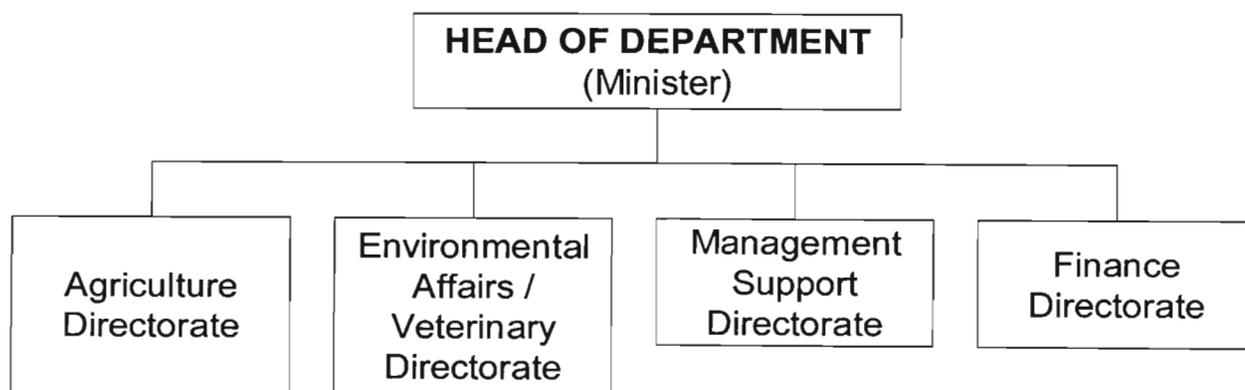
	confidence, but there've been structures like that for a long time, there's representivity, theirs knowledge and there's confidence, and those two areas are difficult to achieve, and I was wondering if those issues are addressed in the SUP, because I think it should be.
PB	We're working with structures, we don't work with individuals, so they normally do have their existing structures and working together with recognised structures. In a community like that they would have structures and you would communicate with the structure that would communicate with its members.
RT	But that assumes that structure already has that equity.
LF	And that it's really working, ja, ja but Paul, not in all cases, are they appropriate, because in the case of the Injaca Dam, if I'm not mistaken, there's is, it's evident that the structures that are representing the community are not doing it like she says, equitably.
RT	The thing is often in the Tribal Authorities, women, for example don't have a say.
LF	You've got to check that.
PB	You've got to check it, but how far do you take it, it's a philosophical question, how far do you take it, do you allow...with people, I mean with local government, if the people aren't happy with the local government, they won't win the next election, we might see it now, but the structure is there that in 3 years time, if they're not happy, and this is where, through awareness and through training and understanding, the carrot and stick approach. The Minister of Water Affairs says, look, we've got everything in place, we are ready to help the community, the onus rests on the local community through the existing structures, that they communicate with local government and the existing structures to get other things in place, you can get things done, but the Minister of Water Affairs can now say lets help people, we must go talk to Land Affairs, we must go talk to Agriculture, we must go talk to Land Bank, a whole long process, and you carry the process, sometimes you have to allow people...the frustrations must occur to get the end result, you have to somehow (indistinct)...both ways, getting the benefits...
RT	Are you saying that, within the process, that skewed equity can be addressed?
LF	Maybe not in the beginning of it but as the thing goes along.
PB	You mustn't forget it, but the thing is to create the mechanisms so that the inequitable position can be addressed, we don't have to, because this is the difficult thing, sometimes you can't address these things...but rather say, the structure is in place, let the due process go.
LF	Because the thing is if they say you have public participation guidelines [Indicating DWAF PP guidelines]...they say here "Skills capacitation empowerment" and all of that but in certain instances, to level the playing field it's going to take you 20 years.
PB	Generations
RT	So where would you start?
PB	Create the mechanism and the structures can sort themselves out, if you don't create the mechanism and you try and redress the individual components, that this person's got more knowledge than this one, you won't get it off the ground...create the mechanism so that the structures, if the people aren't happy with their Trustees, then they get rid of their Trustees, now this is what's happening...
RT	Ja, but they have to have a mechanism by which to do that.
PB	But luckily the law in SA, the Trust law, if you establish a Trust, a Community Trust, this is why the negotiations at Pilanesberg went to the point that we said, they said if we create a Foundation, a Heritage Foundation at Pilanesberg, that manages the benefit flow on behalf of the community, and the Foundation has got clear guidelines on what they may take decisions on and what they may not, just because, funds are generated out of Heritage resources, and the protection thereof, and the Foundation's purpose and mandate, the way it's been established, it's reason, is to plough back funds into educational programmes with children, based on that, then the Trustees must manage it, they've got guidelines and they can manage it, if the Trustees can decide, they're going to go by a new Mercedes for the inkhosi, because they think that's the best way, let them take that decision, let them buy the new Merc for the inkhosi and if the community they will change the trustees and say we'd rather have a school not a Merc, but if the community's happy, and this is the strangest thing for me, because I spoke them, and they said, we would like to give our inkhosi a Mercedes so that when he arrives at a meeting, he's on par with the politicians, they arrive in their Mercs, he arrives in his Merc, now he can't go to a meeting with his donkey cart and go to a meetings, because the rest of the guys arrive in their Mercs, but he's sitting in a meeting to discuss their needs and expectations, and this is reality. That's their decision, if the community doesn't like it they'll change it, but you're not there...that is where the community structures afford them the opportunity to make their own mistakes.
RT	OK, but when you give a 19 year old a credit card...what about good advice?
PB	(Discussion follows about kids and credit cards)
LF	It is because they have appropriate mechanisms.
RT	Sorry Paul, you only gave your name. Could you please, for the record, describe who you are and what you

	do, so that I can have it on tape?
PB	I am Trustee of EcoTourism Africa Trust, we are contracted to Water Affairs to develop the Sustainable Utilisation planning procedure and test it, we're also very involved in the development of the Recreational Water Use Policy, the authorisation procedure and the implementation of the Recreational Water Use policy into South Africa in terms of water use.
RT	Right so you've got a lot of experience here, you've spent a lot of time in this building.
PB	Not only in this building, but 13 years in Conservation and Recreation planning, I trained as an environmental manager, but we've just specialised in environmental management specifically in tourism, especially in eco-tourism, we work with communities.
RT	Well, thanks for all your time and enthusiastic discussion.
Interview ends: 11h40	



**Interview Questions for Haroon Karodia
KZN Department of Agriculture and Environmental Affairs (Environmental Affairs Directorate)**

General
Can you explain your position at environmental affairs? (Who are you and what do you do?)
<i>Chief Director of Environmental Management.</i>
Can you give me some idea of the operations of the KZN-EA directorate?
On your website, a new feature is "Environmental Management". You can't get into that page. Can you tell me what it is?
<i>The page is not ready yet.</i>
Can you give me some idea of the organisational structure of the Department and the interaction between the two directorates (Agriculture and Environmental Affairs)?



<i>There is not enough interaction, but the new structure, where Veterinary Services has moved over to Environmental Affairs should encourage more communication between the directorates.</i>
What is the difference (in functions) between KZN-EA and DEAT?

DEAT are responsible for national policy development, and there is a need, Mr Karodia feels, for streamlining those policies on a provincial basis, because national policy does not necessarily apply nor is not possible to implement at a provincial level. Another issue is that KZN is responsible for implementation, but there are some issues and areas where it seems DEAT has taken over those functions such as in South Durban and with regard to the 4x4s on beaches issue (though there have been developments on this issue as a result of KZN-EA efforts). This confusion between functional responsibilities has caused some problems, not least credibility issues (especially the 4x4 issue.)

On what basis do KZN-EA and DEAT interact?

There is obviously interaction on a formal basis between the two departments, but perhaps not enough, or not in the right way. Because of the issue of the inapplicability of some elements of national policy at a provincial level, KZN is making efforts to influence policy and also to formulate provincial policy within their own Department, which is acceptable to DEAT. Mr Karodia suggested that though perhaps in some provinces there is not the capacity to do this, that KZN has the capacity to formulate strong policies within the EA, and the expertise to implement them. An example of this is the recent change to provincial air pollution policy that KZN has been able to get DEAT to accept.

KZN-EA and Water Affairs

One of the words most used in connection with environment is the word "integration". How would you define that word?

Mr Karodia said that there are different definitions of "integration", and it is important to assess whether I was talking about DWAF's definition, which basically means integration of "surface water, ground water, what falls, and what runs off" which he feels is an improvement on the situation that existed when he was with Water Affairs. That is that the Department dealt primarily with surface water and little else. The Environmental Affairs definition of integration is much more complex, however, in that it involves integration across sectors, including water, environment, land affairs, agriculture, mineral and energy etc. In this sense, integration involves a number of different sectors, NGOs and departments.

What processes are in place to achieve it?

This (EA's definition of "integration") is borne out in his opinion that "environment" should be considered in all sections of municipal IDPs and that process is gathering momentum at a local or municipal level. The achievement of improved interaction between the Water Affairs and Environmental Affairs at a provincial level, however, will depend on the understanding of the same definition of integration by both.

What do you think constrains its achievement?

<p><i>Mainly a desire by DWAF to keep all management of water affairs under its own ambit. This, in Mr Karodia's opinion, is a "hangover" from the apartheid regime, where water and power issues were intertwined. Also, there is the issue that DWAF continues to take a technical view of water management and that the to take a more holistic view will require skills that DWAF does not yet have, or are not sufficiently accepted within the department to have a significant effect.</i></p>
<p>Integrated environmental management has a strong 'water' component. The responsibility for water affairs lies outside this directorate, in fact outside the Environmental Affairs administrative structures. What level of integration takes place at a formal level between EA and Water?</p>
<p><i>Very little for the stated reasons, but there is one instance of cooperation on the LAAC, which is the first and only formal structure which has representatives from both Environmental Affairs and DWAF.</i></p>
<p>One of the problems in the pursuit of sustainability in water management has been the sectoral approach to water, and the lack of consideration of the environment around the water resource. Is the EA directorate advising Water Affairs about environmental management in that area?</p>
<p><i>At the moment, the only formal advice or interaction between the two departments is on the Licensing and Allocation Application Committee (LAAC) for Stream-Flow Reduction Activities (SFRA) – forestry only (at the moment).</i></p>
<p>Is there any communication or synergy between the sectors, especially in sensitive wetland areas?</p>
<p><i>Very little, but it is improving as capacity within the various departments improves. Mr Karodia said that informal communication between the two departments is improving significantly, like for example with the Jolly Rubino situation. Both sectors were represented there, in the filed and strong links were forged between the staff of the two departments through working together on a particular problem. That is also the case with other specific problems, which is contributing to better overall communication between the departments, though that has not been formalised in any way except through LAAC.</i></p>
<p>How is that synergy managed? (I'm talking about power relations between the sectors)</p>
<p><i>It's not managed at the moment, and there is the issue that DWAF is structured differently from Environmental Affairs, so formal synergy is difficult, but informally, things are improving.</i></p>
<p> </p>
<p> </p>
<p> </p>
<p>EA and Agriculture</p>
<p>Recently, (in fact the day after we were field-tripping in Makhatini), the DAEA Agricultural Development Plan for the Makhatini Flats was launched. What input did your directorate have in that plan?</p>

<p><i>None, in fact, Environmental Affairs did not know of the launch of the Plan, though the Institute of natural Resources did carry out an EIA for the cotton ginnery that has been established (by a private, Danish, company) as part of the plan. Generally, however, Environmental Affairs were not involved in the conceptualisation of the plan, nor did they know it was being prepared, or launched at Makhatini.</i></p>
<p>What ongoing input will your directorate have in that plan? (Is the EIA process sufficient to achieve environmental management?)</p>
<p><i>The term Mr Karodia used in reference to the fact that he did not know of the launch of the plan was that “there were a few red faces when [he] got back to the office”. The result, however, is that the Environmental Affairs directorate is not acquainted with the Agricultural Development plan and will have more input in future.</i></p>
<p>What formal communication mechanisms exist between the directorates as regards other such plans?</p>
<p><i>There is little formal communication, except through the EIA process, whereby Agriculture is required to perform an EIA for any land-use change. However Mr Karodia said that with the increasing component of younger staff, or staff that are new to the department, there is an increase in the interaction between the two directorates. Generally, younger or relatively new staff have not had the time to get into the habit of “doing things the way they have always been done”, a situation which has made the “co-operative governance” policy difficult to implement. However, things are changing with new staff in the Department and those changes are filtering up through the levels. Finally, the recent inclusion of veterinary issues into the responsibilities of the Environmental Affairs Directorate rather than Agriculture has increased the level of communication between the two Directorates.</i></p>
<p>What level of interaction do you think there should be?</p>
<p><i>Obviously, there should be a very high level of interaction, otherwise it will be exceedingly difficult for the Environmental Affairs directorate to implement integrated environmental management plans, but as discussed above, the situation is improving.</i></p>
<p>What do you think constrains that interaction?</p>
<p><i>Mainly mindset, as discussed above, there is a lingering notion that “we’ve always done it this way”, and there is a ubiquitous lack of financial resources, so it is difficult to allocate budgets to integrated projects. This coupled with the mindset problem is a constraint. Furthermore, much of the legislation is relatively new, and easy familiarity with all the new provisions is taking time, but Mr Karodia is very positive that this is improving and more positive about the increasing level of expertise and dedication amongst KZN DAEA staff.</i></p>
<p>EA and Municipal Planning</p>
<p>What input does EA have at a municipal level (in terms of planning, and environmental management in municipalities)?</p>

Little at the moment, but Mr Karodia has a great deal of confidence in the principles of the IDP process. Though its implementation has not been ideal, in terms of the fact that there has been some fast-tracking, to the point that some Municipalities IDPs have been approved without the sanction of KZN-EA, at the very least, it focuses attention on strategy and planning. He also made the point that Environmental Affairs was "too late" to be involved in the IDP process, which is why some of them have already been approved despite their lack of recognition of environmental management principles and legislation. What Mr Karodia's department is doing now, is attempting to assist Municipalities in integrating environmental issues into every part of the IDP rather than dealing with them as a section of the IDP called "The Environment". This, he feels is inadequate and will exacerbate environmental problems in the Municipalities rather than ameliorate them. To this end, his department is going through all IDPs systematically and determining areas where local municipalities need assistance in integrating environmental issues into their strategies and plans.

EA and Communities

A significant component of our new environmental legislation is public participation. What processes are in place, or planned, to achieve a better level of public participation in environmental management and heighten public awareness of the need for "everyone to be an environmental manager"?

The public participation principles contained within the EIA process are the basic principles, but KZN-EA representatives in the regional offices have embarked on an environmental education programme to assist in raising public awareness of environmental management principles, especially in schools and among the youth.

EA and the TPTC

The focus in my thesis is on transboundary water resource management, and there is a new agreement on the Maputo basin, which we visited last month, which is going to be administered by the TPTC. That organisation is made up of representatives from the Water Affairs departments of Moçambique, South Africa and Swaziland. Do you think environmental affairs should be involved in some way?

Yes.

How do you think environmental affairs would contribute to or interact with such an organisation?

Involving environmental affairs would allow more integrated management of the basin, and given the interconnectedness of water and environmental issues, the environmental perspective is essential.

What do you think the obstacles (to such involvement) are?

Mr Karodia's opinion of the constraints to any other Department's involvement in the TPTC is that Water

Affairs feels that it deals with water issues and as such, should stay within their ambit. There's is a difficulty overcoming that mindset within Water Affairs, which is why Mr Karodia feels that Environmental Affairs is not involved.

EA and the Pongolo floodplain

What did you think of the floodplain?

Mr Karodia was extremely impressed by the natural beauty of the area and somewhat taken aback at its lack of development. "There is nothing there" was the phrase used, but the potential, he felt, is enormous. He was especially impressed by Clive Poultney's "set-up" at the edge of the pan, and seemed overwhelmed by the beauty of the setting. He is disappointed that the potential of the area has been so sparingly exploited though is resolute that development of the area must first support environmental sustainability, as the area's natural assets are its best assets.

What do you think the first steps should be in arresting the current degeneration of the area?

A suitable flow regime, which support ecological processes and an integration of environmental management principles into water management are essential, in Mr Karodia's opinion.

How do you think EA should be located in that process?

Mr Karodia mentioned the possibility of an environmental management workshop in the area in the future, but that the presence of Vusi Msthal (EA – Jozini) at the workshop was important, and should contribute to EA being more involved in the stakeholder co-management process currently being set up by the LWWP and the WRC.

How do you think other government departments should be located in that process?

Given the definition of integration discussed earlier, other departments need to be involved, but at this stage that involvement practically, is difficult except perhaps in a specific project, such as this.

Does EA support (financially) stakeholder co-management structures, such as the one currently being set up on the floodplain?

Yes, but not on an ongoing basis. This is because if every project with an environmental component applied for ongoing financial assistance on an ongoing basis, the Department would soon be well over its budget as "every project has and environmental component". Therefore, ongoing financial support for one programme or project would set a precedent for which EA simply has not the financial resources. However, the Department can provide "one-off" support for small projects if the correct application process is followed.

**Notes from short interview with Jeremiah Mabika
Farmer near Mboza and member of the Welcome Water Committee**

This interview was unplanned and conducted at the Water Research Commission / University of Natal, PMB, workshop at the Makhatini Research Station from 15th to 18th October 2002. During a break in the formal discussions, the researcher informally interviewed Mr Mabika.

Pongolo floodplain management.

How do you feel about DWAF?

Mr Mabika's experience with DWAF is primarily with Mr Clive Arendse, who is the regional representative from DWAF, and therefore is usually present at the release meetings. He does, however, feel disappointed with Mr Arendse's handling of the releases and communication with the floodplain residents about release timing. Although Mr Arendse is not responsible for all aspects of release timing, Mr Mabika feels that better communication could have been achieved, as it was when Charel Bruwer was the primary DWAF representative on the floodplain. Mr Mabika felt that release decisions had sometimes been made without consultation with floodplain residents, which had both angered and disappointed them, as well as making it difficult to achieve effective management of the area.

Do you have any communication with anyone from Moçambique (informal or formal)?

Mr Mabika said that there is no communication, none at all, except what Clive Arendse says about the Moçambicans. He feels that they are "car hijackers and criminals", but that perhaps the people who live closer to the border may have a different view.

Do you feel that the community on the floodplain has the capacity and the will to provide management information for the floodplain; to whatever management authority is in place?

Mr Mabika felt that the floodplain residents had a long history of gathering information about the floodplain, and that structures already exist for the gathering and provision of information. He felt that there was sufficient expertise within the community to provide whatever information required as long as correct guidelines were given.

How do you feel about the new Water Sharing agreement?

Mr Mabika is positive about an agreement which includes all stakeholders as long as it follows a participatory procedure. He has a good understanding of the various issues: releases, the range of stakeholders (water committees, other farmers, commercial agriculture, Moçambique) and is positive about the consultation / communication process and its development into a participatory approach.

Mr Mabika accompanied the researcher, Clive Poultney and Trinity Salagae to the launch of the Agricultural Development Plan for the Makhatini Flats, which was launched in a speech by MEC Mr Narend Singh on Thursday 17th October 2002 at the Mjindi Farmers' Hall.

What is your response to this plan?

Mr Mabika feels that only about 20% of the people on the floodplain have effective use of the dam while the rest farm under difficult conditions (dryland farms and droughts) in that the only water on the floodplain comes from the river and pans (apart from irrigated land). He commented that he wished to attend the launch of the Agricultural Plan to see what the Department of Agriculture was planning to do with "their" (as in the floodplain residents') water.

Transcription of Interview with Clive Poultney	
Date: 18 th October 2002	
Interview starts: 10h20	
At: Makhatini Research Station	
RT: Robyn Tompkins (UNP)	CP: Clive Poultney (LWWP)
RT	Clive, these are just some general questions, you have written so many papers, reports, various other documents for so many organisation, based on this area, can you give me a bit of background on who you are and what you do?
CP	Well, what I do, because I'm resident on the Pongolo floodplain I've been involved in a number of local programmes, that we've done over the years, through the Mboza Village project and the Pongolo Water Committees which we established in the mid-1980s, which was to try to get people who are resident on the floodplain who are affected by various developments such as the dam to have some control over those elements to enhance their local livelihoods.
RT	OK, there's tremendous potential in this area, obviously, and what is your perception of the current state of the system and why do you think it's in that state?
CP	Well I think the current state that is has deteriorated quite dramatically in the last couple of years in terms of bad agricultural practice or in some cases commercial agricultural practices being located in the wrong zones, also mismanagement of the dam as a resource, by the authorities, and I think that increasingly, what's happening is that you are reducing biodiversity. Biodiversity is precisely what allows people to have a diverse socio-economic system and at the one end of the scale you've got conventional conservation and at the other end of the scale you've got commercial agriculture, so the one attempts to preserve biodiversity in a very unsustainable way, by locking it up into a reserve, and then the other just knocks the hell out of the ecosystem by mono-cropping and forcing dependence, well I don't know if you can say dependence, but...
RT	Leaving a whole bunch of people in between with nothing to survive on...
CP	Ja, and of course, as an alternative, conservation isn't an alternative, because it doesn't generate conservation-related opportunities, so tourism and other forms of using the resource base which should generate good livelihoods is not happening, or its happening in such small quantities that its not really an alternative.
RT	And it will happen less if the system continues to degenerate.
CP	Absolutely, so what you're going to have is the bulk of people and the bulk of the floodplain which actually falls between those two extremities are going to be polarised and that's what you're going to have: a very small conservation area and a whole ecological system destroyed through mono-culture if its not managed properly.
RT	And some very poor people in between.
CP	Exactly, they are going to become an absolute liability to the state where you have a really vibrant local social economy that can be built on, and instead of building on it, they are actually destroying it and replacing it with something that actually can't sustain that number of people or sustain the diversity of livelihoods that we enjoy at the moment.
RT	And the cost to the state of having to deal with that liability of supporting that number of people is much higher than just supporting the system that is currently supporting those people.
CP	Absolutely.
RT	OK, just on the Water Committees, Clive, what led to their formation?
CP	I think, frustration – over the years, these researchers – the main variable on the floodplain was flood discharges, and if the flood came at the wrong time or was too long in duration, it had a major impact on the socio-economic activity, and in all the work that we did, it always came up as one of the most important elements, where people had no control of flood discharges, which determined, or allowed or disallowed people to make a living, so the idea came up to set up some form of local structure through which people could be represented, and through that representation influence the decisions that were made as to when the flood discharges were going to be done.
RT	They were initially made up of five people, fishermen, etc. How did that formation come about? Was that their decision, your decision, Water Affairs decision? How did it come about that those five areas were represented, and do you think that still represents the floodplain or does it need to change?
CP	You see, what preceded that was a fair amount of research which I mentioned yesterday [at the workshop], which we did with the Department [of Water Affairs], and those seemed to be at that point, the biggest group of users, those five different categories, and that came out of the research and for that reason, those were the categories decided on. Whether they are still represent the bulk of users...there's no doubt that commercial agriculture must be represented somehow, and there would be other categories which would need to be part of the new stakeholder structure, but at that time, those seemed to be the bulk of the users.

RT	And it worked?
CP	Ja, it worked.
RT	Worked for quite some time.
CP	Ja.
RT	How would a water committee meet, on a regular basis?
CP	Well, what happened, I mean, is that you had a...each of those committees...we started with 8, and eventually, ended up with 15, but then 2 were disqualified, because there were certain criteria within their constitution, and each water committee was elected, within a certain ward, and each ward authority, the tribal authority would convene the meeting, and we tried to work it in a way that they wouldn't control the entire structure, but that they would be integral to it in terms of calling meetings, etc. and being informed.
RT	And given their respect.
CP	Ja, but it was an elected structure, and that's what we needed – so they would meet on a regular basis. The other thing that went wrong was that within those constituent users, on those 13 committees, they would elect an executive and the executive would actually go to negotiate, they would have to meet on a regular basis because they would have to come up with various pullback positions and negotiating possibilities because it's so expensive to get everybody to a meeting, such is the energy expended by all committees themselves, in that they had to come up with 2 or 3 scenarios, to negotiate, I think that was the exciting part, people started to really plan. So they'd have regular meetings, but when they get to the level of executive, their were decisions and everyone had positions in place that they could negotiate.
RT	That's phenomenal given how isolated this area has been and the lack of resources and Western education, so it's wonderful that that structure worked so well, but it's not working so well now...why do you think that is?
CP	Ja, well I think its two real factors, one is that initially, we managed to get a lot of support in terms of resources, to keep those committees going, keep them going to meetings, they were actually paid a stipend to go, so there was even an incentive to get some people to go to meetings..,
RT	Given that they had to take time out of their livelihood...
CP	Ja, so it was in recognition that they were doing a vital function and then, what we thought was that with the changes in the government, was that these sort of structures would become statutory in that they would be supported by government, and resourced by government though of course that didn't happen.
RT	Even though it should...
CP	It should (indistinct), and because of the nature of the new government and aid then dispersed through bilateral agreements through government, there are very few donor organisations out there, though there used to be that are prepared to fund a project like this...so that's where it came short, but then the other thing was the fact that you had a group called POWADETA, the name of which I...they were in fact commercial farmers, but they also had a political agenda, and they played their cards very well in the late 1990s, that's because the province was in a bit of a state of flux, not the national ruling party in charge, these guys were starting to do commercial crops like cotton, and used their political; connections to discredit water committees, for I think a number of reasons. One of them was that their crops, commercial crops like cotton, the whole crop cycle would be different from food security, or food crops, and so you've got an extra 2 or 3 months on the cycle which is out of kilter with food, and the one around which the floods were structured generally were for food security, this was the water committees, so you'd have an early flood release, which is spring, then a later flood release in about February, March – that was primarily for ecological processes to happen, like fish-spawning, now with commercial crops, they wanted just one flood a year, and at the wrong time.
RT	Winter!
CP	Ja, and there was a hell of a conflict with that, so what these guys did, is they played their political cards and just set up to knock the hell out of the water committees, and the water committees didn't have...because the resources had dried up, and they were intimidated, the whole system just seemed to degenerate.
RT	Well, interestingly enough, this morning, when I spoke to the Vice-Chairman of POWADETA, he said they go direct to DWAF, without discussing issues with other people on the floodplain.
CP	Well – just in that case, he used to be one of the most vociferous members of the water committees.
RT	Expediency politics?
CP	Ja...
RT	Do you think that water committee idea could be used in other areas for water management, do you think it's specific to Pongolo or do you think it can work anywhere?
CP	I think it can work anywhere, not necessarily committees as they are here, but I think some sort of local structure – in fact I've worked on, I've also done work in Mphumalanga where I was contracted to go and help people set up the same type of system, but around a very different set of circumstances – and they do work, as long as everybody understands what the function of those structures are, and particularly if there is some sort of legal aspect to them, what teeth do they really have, are they being given the time of day by the

	authorities, if they're not then it's a bloody waste of time.
RT	OK. What does it take in terms of financial resources to manage a structure like this? I mean if, for example, you were to get the support from government in terms of resources, what would we be talking about?
CP	I think about R100000 to R120000 per anum.
RT	Which is really not a lot considering you've got about 120000 people living here.
CP	No, and I mean, so that's what I think it would take, and probably, with a dam like Pongolo, they could probably get that from the tariffs that they do get – outside of the ones that they don't get...you know, they could probably support that, because at the end of the day, it helps them in terms of co-managing the resource – that will also take a hell of a lot of pressure off what they've got at the moment, and that's one person who has got an impossible load of work to do.
RT	Ja, and an impossibly large area to manage. OK – I'd like to move off of the water committees now and onto the Lubombo Water Ways Programme. What is the LWWP?
CP	It's actually an extension of that whole idea of the Pongolo water committees, but its to try and manage or put in a system of management for the entire waterways which consists of the Pongolo, Usuthu and Maputo rivers, because you've got a very similar set of circumstances on each of those rivers, really you've got enormous numbers of opportunities which can be ecologically and economically viable, so the programme is there really to try and support overall management of the system and also to support projects within that system which are ecologically and economically viable.
RT	Who is involved?
CP	That was, at the moment, it consists of three people, Nyathi, Bruwer and myself, and what we've done over the first two years is to try and locate the programme, and also a structure which allows representation from all the people that use the system from those different quarters and its...we've given it...over a ten year period, the first two years of which we've really used just to feel it out and work on this section initially, and then move it into Swaziland and Moçambique.
RT	A lot of energy.
CP	Well – it's ten years.
RT	Ja. Have you had any feedback from...I know that you've been in contact with the Department of Water Affairs, National...have you had any feedback from them, or any support from them for the LWWP?
CP	Ja, we have, in fact I've taken it to various (indistinct) positions in the Department of Water Affairs...there's a number of difficulties because you are dealing with a transboundary set-up, for example, we've now recently been given a contract, the terms of which we're only just finalising now and that's to help set up a stakeholders structure on this side of the border, they can't allow us...they can't support us to do it overall, so that would have to be done through some sort of joint structure.
RT	Well – that's the next thing I want to ask you about.
CP	Mmm.
RT	We've spoken about the Incomaputo agreement and the controlling authority for this basin is now the TPTC, or Tripartite Permanent Technical Committee.
CP	Ja
RT	I was just wondering – they were supposed to be starting a basin study in September 2002, so as a representative of the Lubombo waterways programme, who has had support from DWAF, has the TPTC approached you in any way?
CP	No.
RT	Not at all?
CP	No.
RT	So, do you think you would have information that the TPTC would require if they were going to do a scoping study?
CP	Ja, probably, certainly.
RT	So if they were to commence a scoping study in this basin, they might be doing a lot of 'wheel re-inventing'?
CP	Ja, it would be a bit dumb because if you just look at some of these faces, you would see that there are guys here, from the water committees, that haven't come to meetings for ages, I mean from right in Mbangweni Corridor, now a lot of those guys cultivate in Moçambique, so really there's that link, that we already have here, and we know a hell of a lot about what happens there, so for example, when the last release of water in September last year...
RT	September 2000.
CP	Was it September 2000?
RT	Ja.
CP	Well, when the claim was that they couldn't allow a release of more than 80m ³ s ⁻¹ , because of damage that

	would occur in Moçambique, it was through our contact into Moçambique that they knew that wasn't true, so there's really all those links, and there's also links into Swaziland going through the Usuthu gorge, you know we've worked there and we've worked for years in this area. It would make their job a hell of a lot easier and our job a lot easier if there was some sort of link.
RT	Ja, some sort of formal basis, especially given that you have funding from DWAF on this stakeholder project.
CP	Ja – but that's only recently, so with a bit of luck, we do extend the programme and it goes the way that we hope, and obviously there's going to be a whole lot more interaction and cooperation with DWAF so I think this is quite fortuitous that over the many years that we've been operating it's the first time that everybody is working together, though its still contentious, its hell of a contentious.
RT	I'm sure.
CP	As long as it works its fine.
RT	And you are getting some support?
CP	Ja.
RT	But – this interim agreement does give basin-wide volumetric allocations, they aren't detailed, but apparently they are in force until 2010. Don't you think that allocations such as these should be informed by organisations like yours – that is organisations on the ground? Why do you think they aren't?
CP	I actually think that, somehow, technically, if you just listen to what we were told yesterday about the Reserve allocation, its somewhere in the order of 20%, now I think having chatted to you before, they can't give you a definite figure, and I also think that they've never really implemented these technical management decisions, and they don't want other organisations making an input at this point because they don't feel confident in terms of what they are implementing in terms of measures at this point. I would think because actually, they are so cagey and defensive about it, that it must be either difficult to implement, or...um... it is something which they feel is not for public consumption.
RT	Well, that's against the law.
CP	Ja
RT	If you were to be providing information, if you were to be linked to the TPTC in some way, how do you think that could work, practically?
CP	Well, I think, because we are field based, we would be able to do that type of work with relative ease.
RT	And at relatively low cost?
CP	Ja, so you wouldn't have to go an field massive teams, because we've paddled these river, and we know what's there, so we'd probably be able to set up a team to do it with relative ease, and also, the Lubombo Water Ways programme and the water committees have worked with the Department of Health and malaria control programme, who've probably done the biggest survey of this area, it's really detailed stuff (indistinct), and so we could probably short-circuit the whole bloody thing very easily.
RT	For one this would be financially advantageous – for the Department.
CP	Ja
RT	And for another, it would obviously create a much better relationship between the people on the ground and the controlling authorities.
CP	Ja.
RT	Alright, the Lubombo Water Ways programme and Moçambique. For almost two years there were no releases from the dam of any significance, ostensibly as a result of a request from Moçambique. What consultation did you, both as a representative of the LWWP and as a resident of the floodplain experience from DWAF as regards those issues, or were you just informed.
CP	No, we were just informed and we were told very clearly, that the decision wasn't made at the level of the regional office, that it was made at the level of national, and it was an instruction that came down and that it was non-negotiable, it's as simple as that.
RT	It was non-negotiable?
CP	Ja, non-negotiable, simple as that!
RT	LWWP & local government, and regional government, I'm not talking about DWAF, what sort of contact do you have with for example, municipal planning in this area.
CP	Very little.
RT	Do you think you should have?
CP	Ja, we should have. One of the problems as I say has been the location of the programme. One of the difficulties is that we had a...in that period, a local government election, and what happens is once you get involved in that lot, you get kicked around like a political football, and we didn't want to get involved in that, and also you've still got quite a lot of conflict, there's definitely tension between the local traditional authorities and some of the new local authority structures, now, to be quite frank, I think a lot of the new local authority

	structures are incompetent, so what we wanted to do is keep away from that, try and get the programme released in such a way that it wouldn't fall prey to, or get involved in a whole lot of other issues, which would then really divert the programme away from what it is meant to do.
RT	Not to mention holding it up.
CP	Ja. So the thing is really, it's a recce period. That's why...you know I've made a number of major bloody mistakes before, and one is over-exposing the programme, we did that on another programme in the region some years ago, and lost massively, so we're just being quite careful not to over-expose the programme, but to try and work it through in a way that it's actually going to achieve the results we set out to achieve. If it means going in to bat, to fight against the local authorities, that's fine, but the issue is that we tried to avoid that. Now it might be necessary to go and meet some of these people, but I think we were just hell of a cautious, maybe over-cautious, but we'll probably rectify that.
RT	LWWP and local communities...
CP	Sorry, hang on, on that one [local and regional government]...when we were discussing doing the same thing at a bi-national level, regional water affairs told us very explicitly that if they were going to support us financially, it would have to come through local regional council. We said that's absolute bullshit, because we just don't want to be involved with them because they have nothing to do with this floodplain, and they now suddenly come and start making demands, and we were actually vindicated by National, because, in fact its water supply which has to go through regional council, not water management.
RT	Well, what's interesting is that at once stage is wasn't even entirely certain who you local regional council was so that's not really surprising...
CP	Ja..
RT	Essentially, you support, actively, community-based floodplain management. Do you think that that can take place at an international – I mean, community-based here and community-based in Moçambique, working together?
CP	I'm sure it's possible, I mean, you'd have to fit in with the structure there which is possibly different from here, Swaziland is still...take Swaziland, you've got a very hierarchical structure there, their traditional authority is still hell of a strong, so you'd actually have to locate it well. Moçambique is very different, of course, where you have a socialist form of administration, now the thing is that that also has broken down and you still have some tribal authorities have come back to them, so it really is to look at it, and carefully locate where it's going and to put it at the level where you're able to get the best form of representation, whether that's in borough committees in Moçambique or through programmes like the Medical Research Council's set-up, by way of their malaria control structures, you know, you can learn from that, maybe that's the way to go, because also, years ago, when we set this up, we were hoping that the water committees would become the nucleus of development.
RT	So, not just concerned with water issues?
CP	No, organisational development and infrastructure for development, because, water is probably the most important determinant of whatever development happens here, so in the long term, one hopes that you'll still have those structures that would then be able to introduce certain development.
RT	There certainly is a legal basis for that within our new legal structure. But what processes do you think that government could put in place...well what do you think is constraining government from supporting these community-based initiatives, because I haven't really seen a great deal of support from them, despite our new Constitution, despite our new environmental laws, despite the capacity-building "buzzword", what do you think is constraining the support.
CP	Well, I think that it's quite difficult to do, it takes a long time to set up these structures and in the long term, you've actually got to decide whether its worth it, whether its cost efficient, and I'm absolutely certain it is, but its just getting there, setting these things up is a real pain in the ass, so rather than go that route, quite often they say, Ag, well, we'll just go with what we have.
RT	And then people just get conditioned to, once again, accepting direction.
CP	Ja. The difficulty is that when there are sufficient unhappy people, and it surfaces as a major issue, and there's direction given to government officials that they have to take this route, then there's just nothing in place, with which to do it, so they have to start right from the beginning again, whereas if they are going to go this route, they could have worked with various organisations, not necessarily NGOs, but organisations that actually have capacity to make an impact, and to work with what's needed in order to set up even some semblance of co-management, because I've seen it also on the Coastal (indistinct) co-management, where a big national programme, was also just kicked in because the will wasn't there and they just said, look – this is not our core business –
	(Turned tape over)
CP	- and the buggers that get in the way there are the conservationists, because they can't make those changes

	or they've got the sort of mindset which doesn't make the change easily, so I think the difficulty there...
RT	It's not their core business?
CP	Exactly, it's not their core business, so what'll happen, is they'll tell you that they are managing Ndumu as a wetland reserve, and you'll say OK, well you know just on your doorstep of this wetland reserve that you're talking about, you've got cotton going into a lot of the floodplain, there's going to be chemical leaching, there's going to be all sorts of other things, how can you tell us that you're just going to manage this as a wetland reserve when you've got all these extraneous factors that are coming closer and closer. Now that was in the context of with the private sector trying to increase the number of opportunities that came from tourism and conservation, but that was what we were told, straight, their core business is to manage it as a wetland, this little island wetland supposed to be close to what it really is – I mean its twelve thousand hectares in a major waterway.
RT	An in an environmentally sensitive area, which they have a responsibility for managing anyway.
CP	It's so myopic, and then the problem is that they become their own worst enemies, because the private sector have also come to arrangements with them where they are getting (indistinct), they don't bring them into the fray, and they would support then hell of a strongly against other private sector resource use like commercial crops. So you've got this pristine bunch of conservationists fighting for what is no longer a pristine area, and so they are not doing themselves any favours. So, strategically if they really want to go into the fray, then they are really going to have to go into the fray in a far more practical way, and say look we've got our bloody private sector here that are reliant on the wild resources, and if you remove those wild resources, we've don't have the private sector to live off.. The guys just don't see it that way, and I think that' also the frustration, once you get to that level and there's that hard bargaining, you're going to come out with some sort of solution. At the moment, it needs to go back a couple of years, when we really had serious fights, because this pussyfooting around is not going to come out with anything.
RT	When we last spoke in May, I mentioned the IFP / ANC dynamic here, and does it have the potential to derail co-management structures. I think that is not so bad any more is that right?
CP	Ja, well look, now with all the floor-crossing, the tension fluctuates, which is also why we were really careful with where to locate the LWWP, because one way or another, it could just be hammered politically, so it's definitely something that has to be borne in mind, because at any time, it could play a major role, but in setting up structures, those are some of the factors that you've actually got to calculate very carefully.
RT	And be aware of.
CP	Absolutely...and make contingency plans for.
RT	And make sure that the whole structure is aware that it might become an issue.
CP	Ja
RT	And to plan for a way of dealing with it when it does.
CP	You see, I mean, just to give you an example here, years ago, its impossible not to work with the tribal authorities, if you don't deal with the tribal authorities, you'll never get the structure off the ground, but its the way in which you deal with the tribal authorities, by accrediting them so that they agree to have an elected or democratic structure working, but where they have some form of jurisdiction but they don't railroad the whole, or they don't commandeer the whole structure. But now, there again, you had to make that structure stronger than just simply the local tribal authorities, because some of the tribal authorities also have political affiliations, it had to be done in a certain way and of course we had lots of flak over the years, lots of flak, claims that we were...but the issue was that the structure was well thought out where that contingency was built in.
RT	So it was robust enough because it dealt with those issues at the very beginning.
CP	Ja.
RT	Clive, just in conclusion, what would you like to see happening here on the floodplain as regards the new water sharing agreement between Moçambique, South Africa and Swaziland?
CP	Well, I think that, what you've got to look at there, you need to look it as a system, so you need to look at allocations for the systems, not for the three countries, and if you can get there, then everybody's going to benefit in some form or other, that's what you really need, though I'm not certain that its possible. If you look at the SDI, this is one convergent geographical system, its one economic and ecological system that actually spans right through the SDI, and people still haven't made that connection, but if you get that right, then these SDIs and things will work, and if you get that right, there's a massive future here...if you don't get that right...forget it, the area's going...I don't know where its going, in terms of predictions its not going to be good...I mean at the moment, its just stressed at least is OK, but nonetheless, its a major determinant to development, so just, how can we have here, where there's massive encroachment of commercial cropping, chemical leakage and so on, those Transfrontier conservation area, they can't work...so it has to be managed as a system, setting up some sort of joint management across those boundaries, it has to happen.
RT	And that joint management can't be lodged in a place far from the system

CP	No, absolutely, so what they need and hopefully what can be created in each of those countries, those field operatives that are in the bloody field, providing the information, doing the work, and then coming back to some sort of trans-administration offices and its not that difficult to do, with the will to do it.
RT	I most of these area, there are already field operatives which have the information.
CP	Ja, bring it on!
RT	Any other comments?
CP	No...no.
Interview ends: 11h05	

Transcription of Interview with Brian Sharp	
Date: 14 th October 2002	
Interview starts: 11h10	
At: Medical Research Council Offices, Durban	
RT: Robyn Tompkins (UNP)	BS: Brian Sharp (MRC)
RT	Generally, what is the MRC?
BS	The Medical Research Council was put here by an Act of Parliament, and is responsible for medical research in the country so it's an institution very much like the CSIR.
RT	Are you involved in any regional cooperation?
BS	Well, I suppose the LSDI malaria-control programme that I'm working on, that has a regional component, there's a Protocol signed at Ministerial level between the three countries lodged at the United Nations. It's a fully legal document – I don't know what else I can say about that.
RT	That's great - Is it possible to get hold of a copy of that – the reason why I'd like to have a look at that – the principles of how that protocol has been set up and how the principles of the Tripartite Permanent Technical Committee – (on) water – agree with them.
BS	Yes – I can send you one.
RT	Thanks. In what sense is the malaria control programme a community-driven one?
BS	OK – I think that really is the issue...and that's what I've been thinking about since you called, I mean we call it a community-based programme in that it operates at community level in that when you spray houses and...and you hire members of the community to actually do that task, but it's not something where you can just take insecticides and hand it out to people and have no regulation, I mean, there are safety regulations pertaining to insecticides, so you've got to have a skilled cadre of people within a country who can actually train people in insecticide usage, um, quality control work that's actually being done...
RT	And that's the (indistinct)
BS	Well, we hire community members, what we did was we actually mapped the whole area, we worked with the community in terms of assigning where the populations are, and we got population data and we created polygons and we've got a spatial map of where people are, look at what the distances are and how far a person can walk in a day so how many houses can they spray, so how many people do we need to hire in that community, so... we try to allocate the work based on a task that should be done within two months, usually about three months (indistinct) we group people centrally and train them, we offer training courses, in safety, and this is all done with the malaria control people in all three countries, so you have malaria control structures in all three countries with all sorts of different experience, so we have the benefit of their experience in putting this together, but we have real changes in terms of buying lots of vehicles, so we have people on the backs of vehicles driving them around and trying to get the community involved in terms of supplying the spray, so if you live in an area and you're getting your house sprayed, you know who you can speak to...so that's the community involvement, it's really not a lot more than that, I mean the community aren't making the decisions in terms of what's happening, but they are being communicated with and we go through organisational restructures in terms of assessing the project so...and there are wonderful community structures in Moçambique, I mean you can get right down to Biro level and the Mayor of that area will meet you and take you out, he'll inform the community before you arrive or before you start spraying and he'll talk to people...so...um...but all that component is the responsibility of Moçambique [Moçambique members of the malaria control programme], so...
RT	But obviously the MRC is supplying technical assistance.
BS	It's not MRC it's this Regional malaria Control Commission that's been formed by...
RT	The Protocol?
BS	Ja, so there's this group that's put in place by an agreement between all three countries and obviously in all three countries, that countries authorities are responsible for making sure that the components that should happen, happen and then the RMCC gets all those managers together and it's discussed how the programme's going and there's a fine detailed proposal as to how this whole thing is all put together, and there's budgets and obviously funds.
RT	OK, so you're getting the information that you need out of the communities in Moçambique?
BS	I've been really pleased with the community involvement in Moçambique, because obviously when you're monitoring something like this and you have to monitor it (indistinct), to evaluate it and make sure that it's actually working, because that's how you're going to get the next lot of funds, that you show that you're actually doing something useful...and the community participation is important.
RT	So their impression of the programme is that it's been successful...in terms of malaria control, but what about how the community feel about the programme?

BS	Well, all our feedback from the communities has been that they're very pleased with the programme, that there hasn't been a programme like this in a long time, I mean, I think it's really positive, I really do.
RT	And what...how do you get feedback from the community, on what sort of basis, do you have workshops or fora or is there formal communication mechanism?
BS	There's a formal structure for the communities in Moçambique, which feed back, so they've got Mayors etc., so there are community heads, who are in charge of certain groups of people in certain areas, they're Mayors really or Biros and they feed back so if you're going to do any work, and the Moçambique authorities and the Health Department feed back into those people, so if they're going to come in and spray, they'll meet with them, they'll chat to them and the sprayers, obviously are working within that structure so although it's a Health Department issue, there's this community structure within which people are working as well, so I think they just interface, well, it's like a matrix, really, it's not an official matrix in terms of...but that is how the system works, but I think it's really impressive, really.
RT	And it's working well?
BS	Ja, you want to go an work at a particular spot so you need to go to [name of Moçambican town], so you arrive there, and it's the middle of nowhere, dirt roads...and they know you're coming, and you get there and the people at the houses know you're coming, because we, they do an annual survey of parasite prevalence in the community, just to see what the infection rates are, and that's the impact indicators, there's process indicators...what areas have you sprayed, how often have you sprayed, what have you sprayed personally, but then the impact indicators are things like reduction in mosquito populations...like you do wall spraying, at the seasonal peak, and you spray the first time as it's coming up again, and it goes down and you hit second time and it just can't recover.
RT	So it is working...um...bit of a difficult one this, what about the environmental effects of the spraying?
BS	I don't want to go there yet. OK, so this monitoring is done by the community as well and each of our central sites, what is done, is we train community members, so we'd approach people and say, look what we'd like to do, is we'd like to fit a window trap, it's a trap in the window and we catch the mosquitoes exiting so we'd like to fit this to your window and we'd like you to run it and would you be prepared to do it and well, ja, we had problems, so we've trained people and we have 8 central sites in this area here [indicating Maputo Province in Moçambique] with 2 traps per site, so 10 people are trained to clear the traps every single day and catch them in a bottle, now there they can see it's working, because they're not catching mosquitoes any more, so at first they were worried, that we weren't going to carry on paying them, because we pay them, but now they know the spraying is working and that's what we're paying them for, so to do the actual monitoring, rather than putting money into expensive modern traps, we're actually using community members to get involved...um...that's as far as we can go you know, where we could get involved with the community, I've tried to get involved with the community because I think in the long run it's going to...the control programme...I mean, it's fantastic, you go there and I met a guy who had been involved with the control programme in the 1950s and he came and worked with us, this is just someone from the community and he'd been in one of these before and he knew all about it and...
RT	How to go about it...
BS	Ja, because he'd been in one of these before, so I think we're creating a whole cadre of people all over the place who are being involved in their own health, at the end of the day, so I think that's important, it's also for education, because we're also doing camp surveys and things like that, you know, how much they knower about the programme, so, ja, I mean, we've never had any refusals, people are involved.
RT	No refusals.
BS	No, you generally don't with health, though, when it's a direct health issue that's affecting people, it's something that's...I think in something like 10 years of working in the field, I've had one refusal to work in someone's house I think in 10 years, that's in South Africa, it's something about...people are affected by malaria, and you come in there and you're doing something, they get to see what you're doing.
RT	I suppose the monitoring that they're doing helps them to see
BS	I think they can see that it's working, they catch hardly any mosquitoes and they knew they were catching a lot before, so, people talk about that so it's an indirect way of getting community buy in.
RT	Ja, and also building capacity. That's something I wanted to ask you about education, are your education programmes about malaria, and how do you deal with other issues that might arise?
BS	Well, at the moment, what we do on the SDI is that we're obviously training spray people, and you get a lot of women coming in now, an increasing number of women are coming into the programme and spraying in communities, it really is going well, so we're training at that level, we're training particularly specific homeowners in terms of this type of monitoring and we're training for management, so teams of people will be trained in South Africa, in Swaziland, and they'll start other programmes in other places, like for the first time, Moçambicans are training in Mphumalanga now.

RT	Oh really?
BS	Ja, which is good, it means, they're skilled, you know, but I think that's the whole thing behind a regional process, is I think training people at higher degree level as well, I sponsor some students at MSc level.
RT	Ja, I've noticed that some of the publications on the MRC website, it was quite a few students.
BS	I think too many! We have a few in South Africa, and Swaziland...now in South Africa, there are probably good health information programmes running and the same with Swaziland, I think Zone 1, I mean, in the rural areas of Moçambique there's probably not much going on in terms of health education
RT	The war?
BS	Ja.
RT	But there's not much going on at all is there?
BS	No.
RT	Do you have much data in terms of populations that you'd share with me?
BS	Well there're 45000 (indistinct)
RT	That's actually where I'm having a great deal of trouble, getting that data.
BS	Well, we know, because we've sprayed all the houses, so we know from three spray rounds now and we're getting the same people every time.
RT	Do you have data in GIS format that you would be happy to share for academic research?
BS	Sure, I can give you maps.
RT	It's mainly the demographics, because it's quite difficult to get demographic data for that area, demographic and infrastructure.
BS	Sure, we can have a look at what you need later, or someone from my staff.
RT	Thank-you that would be marvellous.
BS	Sure.
RT	OK, what is your link with the LSDI?
BS	Well, I suppose we report to the LSDI, to the tri-lateral Ministers, by virtue of the proposal, the Protocol.
RT	The RMCC Protocol, but do you have any formal communication with them?
BS	Yes we do, it's a vehicle, a development vehicle which has been put in place, which has created a platform between 3 countries, where they talk at the trilateral Ministers meetings, on a periodic basis so we feed into those trilateral meetings, but what we're trying to do is see how we can use that platform to ease the process of running a malaria project like this, and there are all sorts of issues, like getting insecticides through borders, getting equipment through borders etc.
RT	But, interestingly in the LSDI's organisational structures, Water Affairs Departments are not connected in any way, so...
BS	But what about these transfrontier agreements or whatever they're called.
RT	Well, Andrew Zaloumis said on the phone that that is a long way away at this stage, but there's a specific Water Sharing Agreement which has been negotiated in Pretoria, for this basin.
BS	OK
RT	And as far as I know, there's little or no communication with the structures that have been set up by the RMCC and by the SDI.
BS	Sure, but I mean, we wouldn't really, I mean, I don't see a very strong cross-link between us at this stage.
RT	Well, I don't see how development can take place without some sort of water management.
BS	No, no and I think with malaria, you've got to have some sort of cross-fertilisation between malaria and development projects, because when they start getting into that sort of thing, you start having spillage, you exacerbate situation, you have more breeding, you can have huge malaria outbreaks, I mean Pongolo is a case in point, we had dramatic outbreaks of malaria near Jozini, when they started (indistinct) so part of the proposal that I had to put in to the SDI was that we would like to know about development projects in the area, so anything from (indistinct) to specific irrigation projects in the area, we need to know about that, we need to be involved in the planning stages, so rather than dealing with a whole lot of people that have got malaria, we can actually do something earlier, so ja, there needs to be...ja, I take your point there should be more contact about those things.
RT	That was another question I wanted to ask, was what links do you have with regional departments of Water Affairs, or national departments of Water Affairs or the Water Affairs Department in Moçambique?
BS	Very little.
RT	Very little?
BS	Ja.
RT	That's I find one of the problems with transboundary water management is that there's very little cross-cutting between all the various projects that are going on and obviously it's something that needs to be addressed.

BS	Ja.
RT	I was up in Jozini in May and we met with Mr Gumede at KZN regional health department there, I'm going to see him next week, we've got a conference there, and he said that the Department of Health (SA) advocated a winter release from the Pongolopoort Dam because it cuts down on vector-breeding areas.
BS	Sure
RT	However, this is contrary to the ecological requirements of the floodplain.
BS	Really, well, why?
RT	Well, essentially, the natural flooding regime was a summer flood.
BS	Summer, of course.
RT	But then there was a sort of pre-wetting in around October, a small one, but flushing the pans...that usually happened in summer, so what is happening now, is the Department of Health, because obviously malaria was such a problem, they get a lot of attention, and what is happening is that the ecology of the floodplain is being damaged, fish populations are down,
BS	Is that because the water's cold?
RT	Yes I can't tell you the number of studies that have been done on this.
BS	Really, hey, because the flooding's happening in winter not in summer.
RT	Ja, there hasn't been a natural flooding regime, there hasn't even been an approximation of a natural flooding regime since about 1996, when there was a period where there was a reasonable approximation of it, that was from 1984 to 1996, and the floodplain was going along quite happily, now those processes are degenerating, and there's a lot of pans that haven't been flushed out, and in the last two years, Moçambique has requested that there be no releases, so it's a complex situation, how does the RMCC link in with any environmental considerations, to take a more holistic view of development, what kinds of links do you have with either NGOs or the Department of Environmental Affairs or Departments of Environment in other countries?
BS	Well, the Department of Environmental Affairs heads the SDI, so we should talk direct to them, any insecticide use etc. they're fully aware of that, so they know exactly what we're doing, we're working to international standards, everything we're doing has been ratified by the World Health Organisation, insecticides being used are registered for use, you know we're not doing anything out of...
RT	No, I'm not talking about the spraying, I'm just talking about the ecological processes that ...um...malaria and mosquito breeding have an effect on.
BS	I suppose the point of view that I see malaria as detrimental, if one looks at areas where you get high-risk malaria, it's most likely the poorest people, so I'm of the view that to get development going in an area, you actually need to reduce malaria, now there's very little evidence for that, there're a couple of good studies that have been done, that have shown, particularly in southern Europe, in the 1940s, they reduced malaria in a couple of countries and in those areas, the GDP went up much faster than the surrounding areas, so one of the ideas in the SDI area is to actually not just take biological indicators to use in malaria control, but actually to bring in development indicators as well, so I've surveyed something like 88 tourist facilities, GPS'd them, some in Moçambique, some in Swaziland, and we're looking at bed occupancy rates, numbers of beds, numbers of jobs created and so on, and then we're getting into small scale malaria variations, so we're going to draw maps that actually show malaria at a small scale, we've done that already and then we chuck the tourist facilities on there and we see what their risk actually is and then we've done a study looking at the perceptions of risk in those areas, so we'd like to know what there perceptions are, malaria rates as a high negative problem to tourism, so we map the sites and what we want to try and do is change the reality, I mean, KwaZulu-Natal has had a 90% decrease in malaria over the last 3 years.
RT	Really?
BS	Ja, it's phenomenal, so spatially, there's been a major contraction, St Lucia is actually malaria-free, for the first time ever, so there's been a major reduction, but I mean historically, malaria occurred south of Durban, there were outbreaks on the South Coast, in 1905 and in Durban, Mount Edgcombe in the 1950s, and now we're talking about 80% of our malaria occurring near Ingwavuma, now by moving, well really what you should be doing is moving that up to [town within Moçambique], you know, you should be moving it 100kms north, and you ja, you just need indicators beyond just malaria indicators, so you do that and it just starts developing, I mean, Swaziland's had over 80% reduction in malaria and they've changed nothing in Swaziland, all we've done is spray there and in Moçambique and we've seen a 30% reduction in Moçambique, and some of those areas have infection rates of 90%, I mean it's phenomenal the impact it has, it also impairs education, and development, it just affects the population so much, so the other thing we wanted to start looking, for baseline is we wanted to start looking at businesses that are indicators in those areas, so we're currently trying to source some studies that were done and weren't published in the mid-80s, looking at number of arts and craft markets, where all of those were positioned and documented so we started using that as another layer to look

	at changeover times so that you're not just measuring the person that's got enough money to buy a service station, it's a poor area, and hopefully that says something about the development and tourist situation (indistinct)
RT	Ja, it's very complex. OK, how did it come about that you started working in Moçambique, was that the result of the RMCC Protocol?
BS	Well, I mean I looked at malaria in South Africa, and I've been doing this for a number of years, and it's probably best for you to have a map and you look at where the high-risk areas are in South Africa and you see it's all round the border areas, and I just looked at that and thought, how can we not have a regional approach, I mean, we keep having these countries, I mean Swaziland and other, and they're saying but all our cases are coming in from Moçambique, so I did some things, ja, I wrote an article about it, about the need regional collaboration, stuff like that and started brining countries together, started raising money and started brining 7 or 8 countries together, and at the same time Southern Africa was discussing regional issues, and we said if you look at these 3 countries, if they stand alone, there's no space to do anything, but if we stand together, we've actually got a really good sphere of expertise and resources in terms, so maybe what we can and should be doing is actually attacking this together, as opposed to individually. The person I was dealing with didn't really like that so we tabled a document, at the malaria meeting saying that regional collaboration is essential, and if we stand together, we'll combat the problem, and that's where it started, we got money from the Development Bank, and then the SDI occurred, so it seemed like a wonderful pattern.
RT	So you... The Department of Environmental Affairs is fully "over" the SDI and you are... what... on the same level or how do you link?
BS	I'm an SDI project, so I feed into the SDI so the Trilateral Ministers, every time they meet will discuss this component, it's like there are different components to the LSDI, so what have they got now, they've got this, it's called the Heritage Convention Act, and they've got the 3 countries, the Lubombo Transfrontier Conservation Area and they've got this malaria programme.
RT	OK, and you're and LSDI programme and an MRC programme, or you're an LSDI programme based at the MRC, I'm sorry, I don't understand this link.
BS	No, the first cap I wear is that I run this programme, there are many people and we do research in malaria and there are all sorts of programmes running throughout Africa.
RT	But this one is base in the same area as the SDI?
BS	Yes it's one programme; I have other programmes in Zambia and elsewhere.
RT	OK, I think you've answered most of the questions I had during our discussion...
BS	We report to lots of people, we report to the Ministers of Health, they need to know what's going on, so they're not SDI and we directly report to them, but all 3 countries and the SADC takes a lot of interest in what we do as well, because it's a regional project that might become a model that can be used elsewhere, so there's lots of lines of accountability in terms of funding as well, you've got to report to the people you're getting your funding from so those are other lines of accountability as well.
RT	There's always lots of people you have to...
BS	Oh ja, I mean you've got to raise the money too, I mean it doesn't just arrive one Saturday morning, you take a project like this, you drive it, you conceive of the idea, you get people involved and then you start looking at how you're going to fund something like this.
RT	How are you funded?
BS	National funding is the South African Business Trust, so they came in, which is really cool, from Year 1, the South African government came in and I think it's all based on success really, I mean, you start making things work and people start wanting to be involved, I mean we got funding from the WHO, but the major funding for the actual spraying programme, not the research components that are linked to the programme, are the Business Trust, the South African government and the Moçambican government.
RT	Is it difficult to communicate with the Moçambican government? Do you speak Portuguese for example?
BS	No, I'd love to, look I'm not one of those people who likes to complain, I look at things as something to solve rather, so I'm not very good at relating negatives, I'm sure there are hundreds of negatives, and I have people all the time coming to me and saying look, this is not working, and I say, look, if it was easy, somebody would have done it already, well, so just solve it, so ja, it's not simple working with all kinds of border issues, cultural issues, financial issues, I mean, how do you run the money, we've got certain financial responsibilities in South Africa and others in Moçambique, but it's working, so you solve it.
	(Turned tape over)
	Side B of this tape was damaged, so the final comment of this interview was not recorded.
	Interview ends: 11h50.

Transcription of Interview with Niel van Wyk	
Date: 25 th October 2002	
Interview starts: 11h10	
At: WRP Consultants offices, Hilton	
RT: Robyn Tompkins (UNP)	NvW: Niel van Wyk (DWAF)
RT	I just want to ask you some general questions first, these questions are simply a guide for me, I don't necessarily have to ask you every single one of them because they might be answered in the discussion, but there're just some general questions and then some questions specifically about this agreement [Incomaputo Agreement].
NvW	No, fine, I am in your hands.
RT	OK – there's one thing as well, that I would like to have recorded. What I've done is an analysis (this is just a part of my thesis), of some international transboundary agreements according to [listed] criteria, which I'd like to give to you, and perhaps you'd like to take a look at it, and then you can get a better idea of where I'm coming from.
NvW	Ja.
RT	The agreements that I've done, are those on the Rio Grande, the US-Mexico Treaty, 1944, the Rhine, the ICPR, the organisation for the protection of the Rhine, in 1950, the Israel-Jordan Joint Water Committee on the Jordan basin, the OKACOM organisation on the Okavango River, the ZRA, as opposed to ZACPLAN on the Zambezi, the reason I've picked the ZRA is because it is a sectoral agreement, dealing with particular aspect of water management and I wanted to examine that to see how that works, looking at one aspect simply, well doesn't.
NvW	Ja, but I think OK, just as a matter of interest, I know those names, but I'm not familiar with the content, but I think you will find that what we've done and what you find in those particular documents, you'll find a lot of common ground in them, because we actually found that with a lot of sweat, you get somewhere and then you find that look this is quite normal, its been done elsewhere and this is what needs to be respected, that's the way things go and it falls into some sort of place logically.
RT	Ja, I also did the TPTC, but specifically on the Incomati, and what I came out with from that analysis is...I mean there's been, quite frankly a spectacular lack of success in terms of sustainability and equity in terms of international transboundary agreements, but there's a lot of positive issues, but if you look at the river from a sustainability point of view, there's been a spectacular lack of success.
NvW	Ja, but if you say there is a lack of success in terms of sustainability, what's your definition, what sort of sustainability are you referring to?
RT	Well, the Rio Grande, despite the Treaty from 1944 being constantly referred to, has dried up, last year.
NvW	The river itself?
RT	Ja, and the Rhine, is more polluted than it ever has been. The Jordan is under such conflict that the entire agreement is breaking down, but that is obviously a function of other things. What the Jordan has done is actually represented the one place where those two nations have really worked at communication, so from that point of view...
NvW	It's a huge benefit.
RT	Yes, very successful. The Okavango agreement is an excellent example of an agreement, but its been completely untested at all, because its not stressed at all, so there simply aren't effective dispute resolution mechanisms...
NvW	Ja so it's probably a lot of talk....
RT	Well, yes, but it does represent an agreement where there's a much stronger basis for dispute resolution although that's yet to be tested. The ZRA has engendered more conflict than it has...
NvW	Is that on the Zambezi?
RT	Yes, the Zambezi River Authority which is purely hydropower on Kariba, and it has actually engendered political conflict between the two nations and it is supposedly a water sharing agreement, so there's a lot of examples. Anyway – this is a purely academic analysis, as I student, I don't have to administer any of these agreements, and I recognise that there would be pitfalls, but from an academic point of view, that analysis showed a number of areas that could be changed in terms of transboundary agreements in the pursuit of sustainability and equity, so I'd like to leave that with you if you'd like it.
NvW	Yes, I'd be very interested, because what I gather from you in terms of sustainability, what it tells me is that these things don't actually work.
RT	Yes, they actually don't...honestly, I can't find one example of any agreement that in practice has worked, so where do we go from here?
NvW	Well, I certainly hope that we are not in the same class here.

RT	Well, that's the thing, if we are, then at least we know, and if we aren't...great, but there's a lot of reasons why these agreements don't work, so from that point of view, I've looked at this agreement and that's what I want to ask you about.
NVW	Ja, now I can give you various opinions on your comments that you've given up to now, but I think you must ask me questions and then we can wrap this up, because certainly, when we went into this thing, one of our requirements that we stated up front, at least in our task team and so forth, was that we must develop something that is implementable and that was our objective, now we already have questions, but we feel that we've done fair homework and that it can work.
RT	OK, then firstly, I just want you to explain your position at the Department of Water Affairs and your relationship with the TPTC, for the record.
NVW	OK, who I am.
RT	Yes, who are you and what do you do, Niel?
NVW	OK, I've got a civil engineering background, but at the moment I am a water resources planner, I work with the directorate Water Resources Planning, my responsibility is to look at the broad water resources planning, the big stuff for the eastern flowing rivers of Mphumalanga and KwaZulu-Natal. So, my position, I'm a Chief Engineer, which is just below Director level if you look at the hierarchy, and also a Senior Specialist Engineer, that's a classification that puts me at Director level, or something of that sort...it's all a bit of detail, but that may give you an idea, also these days we tend to maybe go more specialised rather than go up in the hierarchy for representivity reasons etc. OK, the TPTC, I don't know whether you know what the TPTC is...
RT	Well that was going to be one of my questions.
NVW	Well maybe we should just clear that upfront. It stands for Tripartite Permanent Technical Committee – its a committee, its not a Commission. That is the official organisation created between the three countries, South Africa, Swaziland and Mozambique, to discuss and deal with water matters of common concern and the...if you look at the Incomaputo agreement, that is for the Incomati River system, the Maputo river system, these are the common river systems, that is what it is about. Now the TPTC consists of a number of members, three members from each country, and I've attended TPTC meetings for I don't know how many years now, probably about 12 years or something of that sort, so from my own personal point of view, I think there's a lot of continuity. At some stage I think I was a member of the TPTC, but at present I'm not, so I maybe drive our side of things very much from behind, so er...
RT	So those three members, are they linked to the Water Departments, the Water Affairs Departments of each country.
NVW	Ja, as a matter of interest, we've got the heads of the Water Affairs Departments as the leaders of the delegations.
RT	OK and the other two people.
NVW	Senior officials from water affairs departments.
RT	So all of those three people are from the water affairs departments of each country?
NVW	Ja.
RT	So that is the entire TPTC?
NVW	Ja but as they (indistinct), they bring along all the echelons, staff and observers and so on and so forth.
RT	Do they work with consultants?
NVW	No, not really, the business of the TPTC is such that you can't really delegate that to consultants, specific tasks and so on can be done by consultants, but where it goes about policy, about negotiation etc, its a responsibility and I don't think you can hand down to so-called outsiders. Consultants can be advisors and so forth, they advise these people are the (indistinct). Just as a matter of interest, I do have a Terms of Reference of this TPTC, I mean it's not very long.
RT	Would it be possible to get a copy?
NVW	Ja.
RT	Would it be possible to get any minutes of any TPTC meetings?
NVW	I'd be a bit careful about those, I mean I'm quite happy for you to read these things, but it's a bit sensitive and I think one will actually have to get permission to do this, I'm a bit worried to get into situations of making known of or distributing material that's, let's call it of an internal nature of these organisations, but what I can do is I've got some of the stuff on computer here and you're most welcome to have a look at it to get some sort of idea of what its about, of what's being said and so forth.
RT	That would be great.
NVW	And hopefully that would be sufficient for your purposes, because I would gather that you would just like to know...
RT	Yes, I'd like to get an idea of the processes and how it works.

NVW	Ja.
RT	That's marvellous, thanks. I just want to make of the documents – so TPTC Terms of Reference and TPTC documentation, that would be wonderful. OK, can you tell me what departments of the Department of Water Affairs deal with international issues?
NVW	Um, right...what you're probably referring to Directorates, or Chief directorates or something of that sort.
RT	Ja – I'm not sure how the structures are set out.
NVW	No, its only lately that we started developing specific structures to deal with these particular matters, and we've got a chief directorate, its called International Projects, and they were primarily created to do first of all, the Lesotho Highlands Project, and after they took over the Komati Development Project, which is the Driekoppies / Maguga Dam on the Incomati River and they've lately newly created an International Liaison Directorate, within that chief directorate so on paper, that is where...well... as I see it where these things should be done, the international stuff, but they are at the moment not suitably staffed, to be able to deal with it, so that is why I, for instance, have been involved in here with this particular agreement, because I've historically been involved, but this thing was made up with officially myself, and a lawyer from our legal division, and you could say that we worked on an agency basis for the International Liaison Directorate, that's how it works on paper, in practice, its probably a bit more direct.
RT	OK.
NVW	But primarily, the responsibility should be with international liaison.
RT	OK, Are you in the international liaison directorate?
NVW	No.
RT	Which directorate are you from?
NVW	I'm in the Chief Directorate Planning, that's why I'm Director of Water Resources Planning.
RT	Right.
NVW	So it's a support service that we provided to that component.
RT	OK and then there was the legal department...
NVW	Ja, that's also a directorate, probably slotting under Administration, or Corporate Services, or something, I'm not quite sure.
RT	OK.
NVW	It changes so much nowadays, its sometimes difficult to...
RT	Trace the paths. OK can you tell me what steps or measures or research or development the Department is undertaking with regard to international obligations and Reserve determination with regard to the National Water Act?
NVW	OK, let me tell you. You've now touched on two particular components, let look at...
RT	Can we look at international obligations first?
NVW	Maybe it's a bit tricky to answer, but we've got this TPTC, it is one of the various call it link organisations or organisational structures where we deal with neighbouring states. There are similar structures between South Africa and Swaziland, they've got a Joint Water Commission, there's a Joint Water Commission with Moçambique, and then they've got a structure involving all the Limpopo basin states, the Orange River have also got some structures, so we've got a number of these structures. Within these structures, they identify what the particular needs are etc. We are also a SADC Member, within D It changes so much nowadays, its sometimes difficult to SADC a lot of work has been done to develop the so-called Revised SADC Protocol on Water or whatever which is...and I think within those structures we are identifying what international obligations are. One of the (indistinct) where we are the furthest developed is this Incomaputo Agreement, which was concluded on the 29 th August at the WSSD.
RT	Yes, they have photos on the Moçambique website.
NVW	Really! The funny thing was that our signing ceremony was gatecrashed by the Crown Prince of the Netherlands...and so if somebody of that stature gatecrashes your meeting, you don't complain about it, but it also brought some exposure to what we achieved there...so I think that's what's been done. Various joint studies are under progress, being planned etc, because you can investigate your obligations and so on, but it all needs to be supported by sound technical background information otherwise we can't take t any further, so I would say Joint Water Resources studies is the start of the process or, is an important cornerstone of international obligations.
RT	Sorry, I just wanted to back to organisation structure for the moment...there's a new department in DWAF, dealing with social and ecological issues, Lorraine Fick and Barbara Weston, is it?
NVW	Ja.
RT	Do they have any input or any link with the TPTC or any international structure?
NVW	No directly, though for instance, Lorraine is accessing the TPTC, just as a communication mechanism, for

	stuff that she's doing on the Pongolopoort Dam.
RT	Ja, she was actually supposed to be at our workshop, but she couldn't make it.
NVW	Ja, they're not...call it... in the direct line of the TPTC because they also operate nationally more than internationally, but where required and so forth, they will be brought on board.
RT	And does that go for those directorates in Swaziland and Moçambique – or do they not have them?
NVW	Well, if you look at...basically, on the TPTC, we represent Water Affairs as such, the whole of Water Affairs, so Lorraine is actually represented by my superiors, who are TPTC members, but its just that you activate that as required, the same as I get pulled in when there are Water Resource matters to be dealt with, unfortunately I get pulled in for all sorts of other things as well, but strictly speaking and officially, I should only be pulled in for where my expertise is.
RT	When we spoke on the phone, we discussed the social implications and dimensions of water allocation in water resource management...what...
NVW	Can I interrupt to for a moment, you also asked about Reserve Determination.
RT	Yes, I think we can get to that later, I've got some more questions.
NVW	Oh...that's a hobby-horse of mine, so I don't want to forget that.
RT	No – don't worry, we won't because that also quite an important issue for Pongolo.
NVW	OK – it's your structure.
RT	OK, there are social implications of water allocation in management. What kind of mechanisms does DWAF now have, apart from a directorate to deal with those issues? I mean I know there's a directorate, but what actual mechanisms are there in place to deal with those social issues?
NVW	Perhaps you need to explain your understanding of what you mean by social issues, there could be many, so that we can just talk about the same thing.
RT	Well, I think that water allocation is essentially a social process, if people are living in an area, and are using the water, they understand...they have a connection with that water and having it allocated without their knowledge and understanding essentially makes that allocation very difficult to implement. So how does DWAF incorporate those issues, especially in terms of the National Water Act?
NVW	OK, let me attempt to answer your question.
RT	It's a difficult one I know.
NVW	Maybe not all that difficult, but if we look at the agreement for instance, no direct consultation with stakeholders on the ground was done, but if you look at the indirect mechanisms, we've got a democratically elected government, so the government speak for the people, they've also got to inform the people of what they are doing and so forth, but the question has been asked, you know, why didn't we consult broad stakeholders and bring them on board as we negotiated this, and we did not, for practical reasons, because if you do that you'll be busy probably for the next thirty or forty years...to get such broad consensus is also difficult, but we, within the department we've got various communication processes on the go, creation of CMAs, we've got various committees where we communicate with stakeholders, so we feel that we've got a fair understanding of what the needs are, and what the aspirations are and so forth, and one principle that we tried to follow, at least in the South African context, with this agreement, is not to compromise South Africa's rights, first of all, and not to influence the current state of affairs as far as water allocation are concerned and so as far as the South Africa water user is concerned, there is very little negative impact on water users in this agreement, obviously, to conform with the international obligations now we'll have to improve our management to ensure that our neighbours get what they are now entitled to. Similarly in Swaziland, they will have to apply this to ensure that the downstream parts of South Africa get their share, so that puts particular obligations on us, but those obligations are essentially there already, in the sense that we have moved from an infrastructural development phase, of water management...with the water business in South Africa, to more of a managerial and optimisation, water conservation phase, so we have to improve our internal management anyway, so this does not create any conflict there. Also, in developing this particular agreement, you say, how does it link in with the NWA and so forth, we all feel that we have sufficient knowledge of the National Water Act, and so because we were part of the development, we felt that we could create this thing, develop this so that its not in conflict with the NWA and the national water resources strategy which is up for public consultation at the moment, and so you know to the best of our ability there aren't any conflicts, so...
RT	OK, but with the greatest of respect to the South African water user, there is quite a lot of unsustainable use that is existing use, and I agree that as the Water Authority you have to reduce negative impacts, I think it's quite important that the South African water user is at least aware that they have negative impacts on the sustainability of watercourses with their existing practice.
NVW	Ja, OK, but that takes you to...in certain catchments where we are overstressed already, we will have to now go into a process of reallocation of water to try and get to a sustainable situation, so we've got a particular process that is in place already, and a pilot project that we will be implementing soon, in order to adjust

	allocations of water to deal with the unsustainability and the inequities of the past, all of these things. Basically take a catchment and say OK-right- what are the facts on the table, what are the problems and so forth, identify them and say, what can we do.
RT	So there is an awareness that existing use does need to be looked at from the point of view of negative impacts.
NVW	Ja, I don't know if you are familiar with the national water resources strategy,...
RT	I've glanced at it, to be honest.
NVW	Well, you see that is also part of the process of rolling out implementation of the NWA, and that is where we tell the general public in South Africa how we plan to manage water resources in South Africa and its a continuous developmental process, the NWRS will be an umbrella strategy which will guide catchment management strategies, to be developed for a particular catchment, or water management are, a strategy will be developed, we are busy with a wall-to-wall investigation of the whole country to start putting down the building blocks for a catchment management strategies, we call then internal strategic perspectives...basically figuring out what we are doing at the moment, and what strategies are already in place and then writing up what we are actually doing, getting, call it a corporate understanding within the Department of what we are actually doing, because maybe different people have got different opinions as to what we are doing and what we should be doing and we are trying to consolidate that and then use that as a point of departure.
RT	OK, can we get on to the actual agreement now? Can you tell me, what you think, given that there have been a lot of difficulties with other agreements, can you tell me what you think is different about this [Incomaputo Agreement], what's new about this agreement?
NVW	OK, probably nothing new. As I've told you, this took three years of my life.
RT	OK – but why do you think that this is a good basis for agreement?
NVW	I'd say that we tried to incorporate the best international environmental principles, the Rio principles, at the broader level is incorporated in here, to give us guidance to deal with the investigations, environment, communication, lots of things if you go through the contents of the agreement itself, you can look at the headings to see what has been addressed, that will give you a good idea of what has been addressed, we feel that even though its called an Interim Agreement, we feel that it's a very comprehensive agreement. That's one thing and then also from a technical point of view...
	(Turned tape over)
NVW	We feel that from a technical point of view, we've put something on the table which is achievable. We are, especially in the Incomati, in a very water-stressed area, so it will have to be managed very well to enable us to implement properly, that's a challenge, but we feel that it is possible, it's not impossible. I think we mentioned the management of water within South Africa before, it's part of that strategy.
RT	OK, has your strategy changed significantly, apart from water management in South Africa, from an international perspective in water management strategy, with this agreement, has strategy changed or is it still going to be handled within each country accordingly?
NVW	Look, what we have to do is try and align the approaches within the countries as best as possible, obviously, the agreement is allied to our NWA.
RT	Ja, information flow etc...
NVW	Yes, it is an objective to get the water management systems within each country aligned as best as possible, because you can't work to different rules.
RT	And do you think that the TPTC is achieving that?
NVW	Well, we are at the beginning of a process and I think we'll have to look at international relations over the years and just work out where are we now. We've always had very good relations with Swaziland, over all the years, the result of that or proof of that is the Joint Komati Development Plan, that we have implemented at Driekoppies Dam, in South Africa and Maguga in Swaziland, also subject to agreements and so forth, so there we have always had very good communication. The situation with Moçambique unfortunately is very different, because some years ago, there was hardly and contact, we had very different political systems, there was lots of political conflict between South Africa and Moçambique, but...um...even though you had the political conflict, right through the years, there was still communication, water communication, but one would say, with problems, not smooth communication as such.
RT	I don't think there's ever been smooth communication about water issues between any nations over thousands of years.
NVW	Ja, but are you completely at loggerheads or are you making progress, now lately, I would say also with the political changes, we made great progress in that we've started drawing Moçambique into the TPTC a bit more and discussing with them, and I think, you know, the result of our improved relations is this agreement, it's a fairly formidable piece of work and it demonstrates that we are well on our way, but I think we have to realise that we are on a learning curve...this is word at the moment, its on paper, before we actually make it

	work we haven't got proof that we are actually doing it, but when you are not talking to each other you are getting nowhere, we are talking to each other, we were able, not without frustration, but to come to an arrangement, and to come to a common understanding of how we want to manage and how we want to share.
RT	So it's a step.
NVW	It's a very significant step, not only a step.
RT	On the general principles of the agreement, I'm going to go on to specific questions about the articles of the agreement now, on the general principles, are they listed in any sort of priority or are they going to be prioritised at any stage? So we've got "sustainable utilisation" principle, equitable and reasonable utilisation and participation, prevention (of pollution) and co-operation. Is that a prioritised list or is it simply a list, and are these, if its not prioritised are they at any stage going to be prioritised?
NVW	Um...I think?
RT	Because implementation is easier I think with priorities.
NVW	Well, it could be, but we didn't pay particular attention to the order of these things, because these principles were consolidated out of a whole list and for various reasons some were included and others not, and it was incidental the result. So they are not prioritised, but I think if I just speak off the cuff, because you say it might be better to prioritise them, I'm not quite sure, I haven't thought this through, but I'm not quite sure I agree with that, to say is one principle more important or is it overriding, it depends on circumstances, you may very well be right, you may not be, I don't know, I can't give you a hard opinion on that.
RT	In the UN Convention and the SADC Protocol, there are factors for equitable utilisation that are set out there, factors that must be considered, according to those agreements. One of the criticism of the UN Convention, and this has been perpetuated in a sense in the SADC protocol, is that those factors, because of their lack of prioritisation, are almost impossible to apply, some of them actually, in application cancel others out, like for example equitable utilisation and significant harm. There's a lot of criticism in this area, that in practice, its very difficult to apply all of those factors without any idea of how they should be applied and to what extent they should be applied. Has that been considered?
NVW	Look, first of all, this agreement is in the spirit of all those other Conventions, Protocols, etc., its not in conflict, it is supposed to be a reflection of those given. These are all umbrella types of agreements, it gives you a spirit, it gives you a philosophy and so forth, but as you say its very difficult, to actually pinpoint and that is the reason why you've actually got agreements like this, which slots in under the umbrella, so it is an interpretation of some of those...an attempt to now put more flesh on to it, to say directly, this is how we're going to do it. So this is a further step, but this is again, at the next step now, we have to figure out, how are we going to implement this, so there are further steps that have to come out to say exactly...development of operating rules for example, how are we going to do it?
RT	And that's going to be taken into account here in the studies to be done?
NVW	Not specifically, not really, those studies are our perception of what we should be doing next. The implementation of this is not incorporated there [in the Incomaputo agreement], that is a separate process, which each country will now have to sort out within its own organisation. We have taken steps, where, on the 1 st of November, implementation or an implementation team for this particular agreement will be put together within the Department of Water Affairs at a very high level, we've still got to develop our strategy, to figure out exactly how we are going to do this, its never been done before, so its pioneering work, but these internal steps are being taken and they are separate from those [in the agreement].
RT	So that's the framework, and the implementation is...OK we've got the spirit of the agreement, we are now going to discuss our strategy?
NVW	Ja, but I think to really answer your question on these being sort of "fluffy" and so forth, it's the spirit and that's what comes out of the agreement.
RT	And you're going to take these [principles] then into your implementation, and each country is going to come up with a strategy which then presumably you're going to get together and discuss within the TPTC?
NVW	Within the TPTC, but look...we've developed operating rules for the Komati Development with a task team.
RT	Are those available?
NVW	I think one can make it available, but its not...Ja, it is actually, stakeholders know about it, stakeholders were involved in the particular process of developing those operating rules and so forth, but we haven't formally published those, but it can be made available, its not secret stuff.
RT	It would be good just to see how those rules are structured, to understand how those work in some way.
NVW	Ja, it can be quite tricky, I'm not sure whether I've got anything here, but it can be made available. So there we've already gone into a process where we've got a task team underneath the TPTC, which can coordinate within the three countries, how we want to do things, how we are going to do it and so forth, and a similar process will have to be followed with the implementation of this particular agreement, so its two-tier, you know

	the internal stuff that you do within your own country, but then also to develop the international links, the communication, all those things with the neighbouring states.
RT	So, would you call that an implementation task team?
NVW	Ja, the previous one was called...I can't remember...but yes, it's an implementation task tem.
RT	In article 4, one of the measures to promote partnership, can you tell me what that word "partnership" encompasses?
NVW	Maybe I'm speculating a bit, but what I understand now, is that you don't work individually, you work as partners in this thing, for instance if we've got to...
RT	Sorry, but is "partnership", South Africa, Swaziland and Moçambique?
NVW	Ja. But you know we've got a very strong guide on water conservation in South Africa for instance, at the moment, and what we would like to do, is for our neighbours to operate in a similar fashion, they subscribe to the same principles, that's been made clear, but we can share our experience and so forth, so we go in to these various committees as partners, we made that promise to them, in certain respects, they may learn from us...
RT	But we shouldn't be re-inventing the wheel every time?
NVW	Ja, but then you get stronger and weaker parties and so forth also, but I think its very true now that in some aspects, South Africa may be quite strong, and in other aspects, social aspects and so on, maybe some of the other countries will be stronger and er...may have experience that we can share, I think that's the spirit of this agreement.
RT	OK...to get on to article 5, the Shared Watercourses Institution, that's specifically about the TPTC, there've been quite a few problems with the TPTC to date, I'm thinking specifically about the Moçambique threat to take us to the international Court of Justice...um...I think that was in 1999, I've read a number of articles about that, which culminated in the Moçambique pushing to revise the SADC Protocol.
NVW	Oh, ja, there was a particular problem...with the SADC Protocol.
RT	Well, though I realise that this agreement has to some extent mitigated that situation, how will, management strategies and operating rules be communicated to people who have been involved in these conflicts...how is the TPTC as an organisation going to address conflicts on the ground and have resulted in international problems?
NVW	Well that SADC issue that you're referring to was not a TPTC problem, we try to steer clear of that because otherwise it contaminates all of your dealings and so forth, you've got to be quite careful...
RT	But the TPTC is now the joint body for cooperation between the parties and essentially is going to administer the basin.
NVW	Yes, but just on this particular basins, I think the previous issue that you referred to on the SADC protocol was at a higher level.
RT	Yes, I recognise that it may not be a particular TPTC issue, but it started on the ground and at some point is going to come to the TPTC as the administrative body, or is it not, is there another path that may be taken and what is that path?
NVW	I'd say that was...ja...OK, as I say...I'm not too familiar with the issue but it did crop up and we just tried to move around it rather than through it because if you address it in one particular, with one, or within one particular organisation, you can get it sorted out, you don't have to sort of bother all of the others with it, that hasn't quite answered your question.
RT	No – it's a difficult one, because disputes are going to...in every transboundary water management situation, disputes arise, and they often arise on the ground between people in cross-border communities. Who is going to deal with those disputes, I realise that this agreement has got dispute resolution mechanisms, but how is the TPTC going to communicate with users in this regard, is it going to be an international settlement or dispute, is it going to be arbitration, or are there any mechanisms before that?
NVW	Well, if you look at Article 15, sub-article 1... If there's any dispute between the parties concerning interpretation or the implementation...they "shall be settled amicably through consultation and negotiations between the Parties".
RT	OK – that's the parties though in terms of South Africa, Moçambique and Swaziland.
NVW	Ja.
RT	What I'm talking about is a community here...here you've got your border, and there's a community on this side and one on that side, and a dispute arises between them. Now it is an international issue and it will presumably come to the TPTC first. Now what kind of structures are there in place for a negotiation like that, in other words before it gets to be an international incident, before it gets to require arbitration at any formal level, are there any measures for that kind of consultation and negotiation?
NVW	OK, at the moment, this is a national responsibility in each country, there are not direct official links on the ground, so each party with a problem will have to go to their superiors, then to the TPTC delegation, and the

	TPTC delegations get together, now that's quite cumbersome, and we have realised that direct links will have to be built up.
RT	Especially in those areas, where there is already conflict.
NVW	Yes, especially in those area, but now we have talked about the development of operating rules, where a particular task group as a sub-committee of the TPTC will have to be formed, and I think that mechanism is the best suited to first of all try and avoid this sort of this, that's why you try and develop operating rules, so with that particular sub-committee of the TPTC will try to...sort of...solve those problems or prevent them. That's why they've got those. If it doesn't work, then they go one level higher.
RT	Well the situation changes, that's the thing, I mean, the operating rules in a static situation would continue to work, but the situation does change, more people move into an area or there's a flood or there's a drought or something changes and dispute avoidance is important.
NVW	Ja, I think we've already got the example of an operating committee or an operating task team that did function before, OK, they didn't end up with disputes, and I would think that they would be your first mechanism to avoid this sort of thing.
RT	So, there is a place to go or there is envisaged a place to go.
NVW	There is envisaged a place to go but I must say that its all very loose at the moment, because we are at the beginning at the moment, but its not that there is absolutely no alternatives at the moment, and I think you learn as you go, and as you develop.
RT	So, interestingly enough, Niel, in the Pongolo area, the Medical Research Council I don't know if you know what they're doing, but they have a malaria control program, and they've basically taken that whole area an one area, and just "ignored" the borders in-between and they've got a very strong community communication structure and they are managing to significantly reduce the incidence of malaria.
NVW	Ja, its interesting to see where that one comes from because that was initiated by the Lubombo Spatial Development Initiative, I've lost touch with it but I was involved when that thing was started up, and the initial objective was to "rub out" the border and say OK, this needs to be done, and I think its also a way where parties with better resource availability can actually support the rest, and say this is in fact in the regions interest to do this, which in this case it obviously is, so we say, let's rub out the border, get the job done, end of story, so I think that's a very good demonstration of what can actually be done. But there, you've got common objectives, no conflict, so it's a bit more simple.
RT	Yes, I do understand that, but its their structures, just from their structural point of view, its quite interesting what they are doing, I mean, they do have a Protocol and an agreement [internationally], but their structures are excellent in terms of community communication and perhaps the TPTC can use those structures in some way.
NVW	Its interesting...maybe you shouldn't record this...no, no, don't switch it off, you can use what you want, but you asked me before how well was this agreement [the malaria control agreement] communicated and consulted within South Africa, if you look at that particular agreement between the three countries, we [DWAF], I think we got two days or something to comment on it or whatever, we were just lucky that we got to know about it, so that just shows you that its not always easy...
RT	No, well there's no perfect solution, none of this is easy, there's no-one going to come along and say here's the perfect solution and you have to learn as you go along, but I think the most important thing is the flexibility of these agreements, if they're not adaptive...for example, the 1944 Treaty between the US and Mexico is completely inflexible and its actually creating more conflict at the moment than its helping to get rid of...so, ja, I think the flexibility is important, recognising that we don't have the perfect solution is a good start. Sorry, if we can carry on...Exchange of and access to information. How will information be obtained.... in these studies that are going to take place, who is going to do these studies, and how is that information going to be obtained, by whom, according to what standards and how is it going to be communicated, if you can give me an idea of that.
NVW	A mouthful...
RT	Yes.
NVW	OK, what studies...the way that we've done the Joint Incomati basin study, for instance, again, a sub-committee of the TPTC got together, figured out how we're going to fund this thing, how will we manage it, appoint consultants to do the work, and come up with reports etc.
RT	Sorry – consultants...
NVW	Ja, which you access via the various procurement procedures of the countries. We're busy setting up a joint study in the Maputo basin at the moment, the lead country is Swaziland, they are chairing it and guide the process to other countries who are members of the sub-committee. What we are doing at the moment is to OK first of all, see whether we can find common ground on procurement procedures, we've found that all three countries subscribe to World Bank procurement procedures, so they are not in conflict with each other,

	so that's how we procure, you've got to look at funding first of all, not first of all but also, where can you...how will you contribute, normally the easiest way is OK, go evens, so each country must figure out where its going to get the money from, Exchequer funds, or donor funding, we've got fair access to Exchequer funding in South Africa, Moçambique for instance is not in a similar position and they must therefore rely on donor funding, so they are now picking up a bit of a problem, but we are now ironing out these things. What we will then do is we will publish all expression of interest, we will have a description of what needs to be done, go out, publish in each country, which consultants are interested in doing this, this is more or less what the job is about, they will give us an expression of interest, we will shortlist a number of consultants out of those, judged by particular criteria which we have developed and then we will ask each of those consultants how they would tackle a job like this then you will evaluate these proposals within a committee put up between the three countries, again according to particular criteria, you'll appoint a consultant who will go out and do whatever you have told him to do, there will be built in, a particular requirement where there needs to be communication processes in the study itself, in the various countries, so that you go to the public or stakeholders and whatever, and the contents, not the contents, but first of all you try to get information from them, you keep them updated, and take your results to them at the end of the day and then try to get comment, you know it goes through a fairly sophisticated public participation procedure.
RT	Oh – so that's where the public participation procedure is going to be brought in.
NVW	Ja, I think before we go, I must give you a pamphlet on the so-called Thukela Water Project.
RT	Oh, Nevil Quinn was quite involved in that.
NVW	He was at some stage ja, no we've got a nice glossy document which sort of summarises what we've done there, that's the sort of principles, I think it's a good illustration of the way we conduct studies and we'll apply the same sort of principles with international stuff.
RT	So what stage is it in at the moment?
NVW	Alright, we've got the JIPS study for instance, that's one that's completed, so its behind us, it was not without its own stumbling blocks, it took ten years to complete, but be that as it may, we have a product and we are now in the beginning phases of the Maputo thing.
RT	Sorry, what study was that?
NVW	That's the Joint Maputo Basin Study.
RT	Joint Maputo Basin Study...um...that's the one that took ten years.
NVW	No.
RT	Oh – that's the one that's just starting?
NVW	Ja.
RT	Which is the one that took ten years?
NVW	JIPS, Joint Incomati Basin Study.
RT	Is it possible to get the results of that...to get any documentation on that?
NVW	Can I give you a hard answer...No.
RT	You can say no...
NVW	No, it's just a question practicality, the Joint Incomati Basin Study, its been completed and so forth, but its not been formally accepted by the TPTC, I've given lots of information to people over the years, so I've got a pile of documents, and you are most welcome to look at them if you want to.
RT	I will come up to Pretoria at some point.
NVW	Well, you can come and look at them, but it's just the practical problem of duplication. What we are trying to do is get them on to CD, and then I can just give you a CD, but it will take a couple of months before it's available.
RT	OK.
NVW	But...ja...in theory, the only problem is practical one, apart from that the info is available.
RT	OK, that was going to be one of my questions, is how do you communicate that information. OK, transboundary impacts, moving on to Article 13, how do you define a transboundary impact, what makes an impact a transboundary impact?
NVW	OK, if you...
RT	OK, for example, if there's x reduction in flow, is that a transboundary impact?
NVW	OK, the way that we tried to address that particular side of things, is to bring in the word significant, significant is subject to interpretation, but anything that you do upstream in a water basin, might have an impact, and that's one of the important or one of the tricky things, say for instance, the Moçambicans want to know all the licenses that we issue, now that's impractical, so you have to define significant.
Tape ends at this point, and was replaced only after the next question had been asked, but it has to do with impacts in the Pongolo area, as a result of a controllable flow from the Pongolopoort Dam.	

NVW	...Clive Poultney and Charel Bruwer's operating rules of the system and their flooding, and so forth, but there is some water up there that can be utilised economically and so forth, but you know there's been many attempts but few successes.
RT	Ja, but now that's the problem is that there is a new agreement here, and there's a Dam where obviously the releases are controllable, but the amount available for release is being slowly taken up by various processes and is there going to be any left for release into Moçambique? How does the TPTC deal with a situation like that?
NVW	OK, if you go to the agreement, Annex 1, it gives you the shares and the water that the various users are entitled to.
RT	Do they know?
NVW	(Pause) I certainly hope so?
RT	Because I don't think they do.
NVW	Well, look, our regional staff and so forth, they've got access to this documentation, it's been provided to them and so forth, and Clive Arendse is involved there, so is these people do not have access to it its a simple matter of internal communication, I don't operate at that level, so I can't tell you, but it's certainly available.
RT	Well, with the greatest of respect, Clive Poultney and Clive Arendse were at a workshop last week, and with the greatest of respect to the TPTC, this has not been discussed, and the people on the ground don't know about this agreement and they don't know about these allocation. The Department of Agriculture, who did a presentation, and the launch of the Makhatini Flats Agricultural Development Plan also don't know about this agreement, so I think from that point of view, there's a problem.
NVW	No, fair enough, it is, but the regional management is aware of this, they've been kept up to date and so on and so forth, so I think there is a problem with their internal dissemination.
RT	I think so!
NVW	But also, maybe what I must say, call it in defence of this thing, is if you look at the way that this has been structured, there's a lot of spare water or reserved water for South Africa in the Pongolo catchment, so the effect of this will at least initially be invisible to the user on the ground, it's important that they know about it but it will be a long time before the implications of this impact them, so they can carry on business as usual.
RT	OK, well business as usual at the moment, is, as I said, DWAF is funding a stakeholder co-management project, so...the information that comes out of that project, because obviously they require management information, can that information be used in any way for this basin study because I think it would probably be worth it in terms of saving money.
NVW	Yes, no, obviously, when we set up these studies and so forth, we employ consultants, and I think we're now talking...not talking about the agreement, we're back at the study itself, but that would be part of the communication process required in the particular study, and that is your stakeholder analysis, your institutional analysis, all of those things so that you make it the business of the particular investigation to pick up those things, because we don't want to duplicate, we want to integrate as much as possible, so that will be the objective...well in practise it's never perfect.
RT	Well, nothing's perfect.
NVW	Ja, but most definitely it's recognised.
RT	Ja, because it seems to me that if already DWAF is spending money in an area to provide that kind of management information then it can be used in another area of the Department, or another directorate of the Department and it in fact should be used. It seems crazy to spend money on something else, when you are already spending money in the same area.
NVW	Just as a matter of interest, you asked no what are the water shares and so forth, Maputo watercourse, the amount of water that can be used there, now you've got all the figures...
RT	That's something I wanted to ask you...First Priority supply...what exactly is that? Has that to do with the Reserve?
NVW	Ja, this is particular terminology only used in this agreement, because people said that our common terminology that we use in South Africa is confusing. Maybe we've got something more confusing but here it actually means domestic water supply, supply for people, the concept actually comes from – initially this meant high assurance water, and low assurance – I don't know if you're familiar with those terms.
RT	Yes.
NVW	OK well for first priority read high assurance, and the other, low assurance.
RT	OK, given that this is now an agreement between South Africa, Moçambique and Swaziland, South Africa's NWA requires the Reserve, how does this agreement take that into consideration, I mean this is obviously in line with our own laws...
NVW	Ja.
RT	So how is the Reserve incorporated into this agreement, just purely from a South Africa perspective?

NVW	Ja, I'll tell you more now, but we've got certain specifications here
RT	Target in-stream flow?
NVW	Ja, it's a bit of a concept that was developed here, but in South Africa, we are just at the beginning of implementing or operationalising the Reserve, we are in a way trying it in the Incomati River, playing around with operating rules that we've developed and so forth, we are now also operating...it's the first real test on the Sabie River, where the Injaca Dam has just been commissioned, we've developed a comprehensive set of operating rules to take into account in-stream flow requirements that have been developed for that particular river, just to start testing our methods and so on, but we haven't actually really fully implemented any full Reserve in South Africa, we haven't done any, call it full or final, final is not really the right word, because our methodology is not complete yet, were busy developing them.
RT	Is that what you're doing here (in Hilton).
NVW	Partly, but this is now for the Thukela River that we're doing a Reserve Determination, but it's actually impossible for us to incorporate the full final South African Reserve in here because we simply don't have it yet. We also need to, before we actually implement the Reserve fully in an agreement like this it will have to be aligned with the processes in the other countries because they are not synchronised, and it will not work very well.
RT	That's going to be very difficult ...it's essentially saying that there's unlikely to be a Reserve determination, especially in those cross-border areas for quite some time.
NVW	Well, I think we'll have to analyse the South Africa situation a little bit better before we can fully understand this one, but what we did do is that there's a common understanding between the three countries that something of this sort is required, that we've got to care for the environment, what we've done here is an attempt to pave the way for that, to sort of...start taking the first steps because if you look at the level of confidence at which these were determined [indicating allocations in Annex 1], it is extremely low, but its is just to say we recognise and we make a start, this is the first step and I think under the circumstances, it is the best we can do because I think if we had to take the full Reserve into account here, it would have been another 10 or 20 years before we could reach this level, so we've done what we could as best we could.
RT	Believe me, having spent the last few weeks trying to find out about transboundary water resource management, I understand the level of complexity that you have to deal with, just the number and extent of the issues is phenomenal.
NVW	It's something that I wanted to say before in one of your previous questions, and that is you know, how do you align an agreement with internal legislation, you know where there is conflict then each country has to go back and re-look at the internal legislation, then change the legislation to avoid or eliminate the problems, or change the agreement. Now there are a couple of things that we have to do in the environmental field, and we have taken steps to initiate that alignment through the Minister of Environmental Affairs, that's maybe something that should have come up.
RT	That is something I also wanted to ask, what kind of representation from the Departments of Environmental Affairs in these three countries is there is the TPTC, because water is...
NVW	Ja, it's so closely linked with the environment, now previously we had representatives of other departments and they can be called in as required, but there is no permanent representation from the Department of Environmental Affairs, at the moment we act as a sort of an agent for them, when environmental problems come up with communicate with the Department of Environmental Affairs, sometimes at very high level, to try and address these but it may be something, and I think that will require attention in future, I think we are due for a "revamp" of the TPTC, it should be investigated and converted into a River Basin Commission, for instance, when these things happen, you can undertake institutional analysis, and see what is the correct representivity, or who should be represented there, so I think it is on our path.
RT	Ja, I think environmental affairs is very important for effective water management.
NVW	Ja, well now you're getting into the argument, should we have a separate department of Environmental Affairs, or Water Affairs...
RT	Yes, I guess, but certainly in terms of river basin management, the environmental component is very important.
NVW	Ja, but I think in certain respects the Department of Water Affairs is fairly strong, so I think sometimes we are in a better position to deal with environmental issues than the Environmental Department themselves, but for instance, this particular agreement was passed via the Department of Environmental Affairs, and other also, just to ensure that we are not treading on other people's toes and that we are not in conflict, that they do realise what we are saying here, and that we've got general agreement, but there's also the CEC, I'm not sure what that stands for, but it's basically a committee consisting of directors-general to communicate on environmental issues, at that particular committee, many of our problems that we have picked up here, our concerns, linkages etc, have been put on to the agenda so there is high-level communications between

	DWAF and DEAT via existing structures to actually address those issues. Because we got fairly worried at some stage because there is some legislation in here, or not legislation but in the agreement which we feel are part of the environmental affairs mandate, not water affairs, but with cooperative governance, we try and do the best we can.
RT	And also, with water its impossible to take a sectoral approach.
NVW	Ja, but in that respect, I think we integrated quite well.
RT	OK, just on capacity-building and dispute prevention, does capacity-building in state, that is the state of South Africa, Moçambique etc., imply that only government departments will benefit, or are any capacity-building plans envisaged for local communities to assist the TPTC in operation, implementation and water management?
NVW	I think we are also very much at the start of processes, you know with actual institutional analysis that will have to receive attention. Its been recognised right through our process here that capacity-building is a major need in all three countries and you've got to build your own capacity, you've got to build cross-border capacity, you've got to enter into partnerships, you've got to share all of those things.
RT	It's all very new?
NVW	Ja, it's been recognised, but it has not actually been addressed, and I think capacity-building will be the subject of a fairly specialised analysis as to requirements, it's been identified that it needs to be done, but it's looking for the resources....because even for capacity-building you need the resources, people don't often manage to identify suitable resources.
RT	It's always the difficult part.
NVW	A lot of energy went into the Incomaputo agreement, and now resources, hopefully will become available, but I'm not quite sure where they'll come from.
RT	Well there's actually a very interesting paper that was written by a constitutional lawyer contracted to the IUCN, and its an analysis of transboundary natural resource management in Southern Africa, and it was written by Jennifer Mohammed-Katerere and published on the IUCN website. I'll send you the reference.
	Tape ends, but discussion continued on the review paper mentioned above for about one minute. Tape turned over
RT	OK – just on dispute prevention. A good way to approach disputes is to envisage the kind of disputes that might occur and then work out how to deal with them. What kind of work is being done like that within the TPTC, or are you going to leave it to consultation and negotiation, or has anything actually been envisaged as to what kind of disputes there might be? (I think that would help!)
NVW	Ja, I don't think any particular work has been done to try and identify we sort of learn as we go in the hard way and not necessarily solve them as efficiently as possible.
RT	Well then may I make the suggestion that some organisation or body within the TPTC does that?
NVW	Ja it's a good suggestion because we often have lots of foreign donors interested in providing support, and many times these efforts are uncoordinated as you talk I'm wondering whether this is not worthwhile suggesting to some of them, look, do some work on dispute-resolution.
RT	It is actually one of the criticisms [of TBNRM] that Katerere makes, that no disputes are envisaged, so when a dispute comes, a mechanism has to be put in place to deal with it, but if it had been envisaged before, it might have been able to be avoided by a mechanism that is already in place.
NVW	Ja, it's interesting if you just look at it, every time TPTC strikes a problem, a sub-committee is established, but then if the sub-committee is not properly equipped...
RT	Well, then perhaps it should be suggested.
NVW	Well, no special work has been done but I think that all of our officials etc., at some stage they are subjected to courses on dispute resolution, but that's very general, nothing specific has been done...though we've had a number of disputes.
RT	But that's often the case in that there's an organisation, but there's no envisaging of what could cause a problem here, and then a problem comes up and that organisation now has to go into gear to deal with that problem, whereas perhaps envisaging it might have avoided it. I think that's pretty much it.
NVW	But we haven't dealt with you Reserve questions.
RT	Yes, that's something I wanted to go back to. What steps or measures or research or development the Department is undertaking with regard to Reserve determination with regard to the National Water Act?
NVW	Have you got two days available?
RT	Laughs, ja.
NVW	OK, if you look at...OK maybe this is a bit general, but if you recognise I think in 1996, the Kruger Park Rivers, we actually started looking at what water needs to be left in a river for the maintenance of the ecological health, and a number of initiatives stemmed from that the Kruger National Park Rivers Research Programme (KNPRRP) for instance.

RT	Sorry, what about the Shared Rivers Initiative on the Incomati?
NVW	Ha, ha, what is that?
RT	Are you not familiar with it?
NVW	No..
RT	Oh, you are, but I've heard from Nevil that its not working so well.
NVW	Well, I'm glad that is the conclusion because...
RT	That's your conclusion?
NVW	No, it's just that...look...they registered this thing with the TPTC and so forth, and we had a workshop on it but it seems it fizzled out, there was a lot of good talk in the beginning and that also stems from the KNPRRP, by the way, that was an offshoot in a way of the KNPRRP, but the thing never really as far as I am concerned got off the grounded very time I enquired about this thing I could never get anything back, so it didn't really come off.
RT	Why do you think that was?
NVW	Maybe it was a bit of an ambitious programme, communication problems, so...ja...I'm not sure what the problems were funding, communication, personalities...I don't know, but coming back, within the KNPRRP also took a couple of turns and about turns and so on, but that was one of the initiatives, also within the Department we started developing methodologies to (indistinct), that was the forerunner to reserve Determination. Those were documented and eventually culminated in writing the Reserve into the NWA, so there are sets of protocols now, the Reserve determination process, components of it, we have developed already, but the river classification process is still, its a vital component, but it's not been done yet. We do not know how to classify rivers which are important, that needs to be done still, methodology development still takes place, but I feel that its over requirement on certain components already and other are missing.
RT	Sorry, can I just go back to why a river is important or not important. What makes a river important?
NVW	Well, important from a water supply point of view, an ecological point of view, a cultural point of view, whatever, we've got to identify these criteria, how to weigh them up or how to judge them.
RT	So that's an important component.
NVW	Yes, one of the most significant outstanding components, because before you've done that, you cannot do a full Reserve determination and you cannot go through the whole process, at the moment all the Reserve determination processes that we've gone through are preliminary, you can't complete the process, that's not to say that what we are doing is not useful, but we can take it up to a point and the idea is that we will hopefully be able to, with as little effort, convert to the final stage. That is what we're doing next door [in WRP offices].
RT	What you're doing next door is working on those actors or determining the importance or classification of a river?
NVW	We're doing a Reserve determination for the Thukela itself, and we will take it as far as we can, but we cannot take it to the final stage.
RT	So that information that comes out of the Reserve determination will be available?
NVW	We've got a very extensive public participation process.
RT	Yes, I have had some experience with that in our course last year.
NVW	Tell me what you're doing with my programme?
RT	Well, we were looking at the public participation process itself as regards NEMA.
NVW	(Mumbled) We've had particular problems with NEMA...when we started we knew more about the environment than the Environmental department itself. That led to a lot of conflict.
RT	Well it does, and that's also another problem with transboundary agreements, is the number of departments nationally, the kind of cross-cutting that's needed is very difficult to achieve, I recognise, Niel that this is an extremely complex, fraught, difficult task, so given that you've been so involved with it for so long, just to wrap up this interview, because I'm sure I've taken enough of your time, are there any comments that you would like to make which encompass your feeling about transboundary water resource management.
NVW	Well, you cannot underestimate the importance of it, you know people will say that wars have been fought about water and so forth, fortunately we've never reached that particular stage, but if you look at the very vulnerable situation the downstream countries are in for instance, it makes it extremely important to them to have some sort of water security, because if you look at Moçambique for instance their economic hub is in the southern part of the country, which is in a, relatively speaking, water scarce area, the same as for South Africa, we've got our economic hub up in Johannesburg etc., we've got to import water there, to ensure its economic well-being, Moçambique's got a similar problem, South Africa is upstream, so I think, regionally, it's been extremely important to actually conclude this particular agreement, because it now tells us what we are entitled to, it gives some assurance to Moçambique, not some assurance, a lot of assurance, as to what they are entitled to because internationally, you know, we now have to comply with this, they know what they can

	plan for, what needs to be done, where they stand, we know where we stand, so I think that it's an important achievement, but the proof of the pudding is in the eating, so we've now got to start eating and seeing...
RT	Implementation is always the difficult.
NVW	Probably and even harder test will be developing this thing.
RT	Well, I think that's pretty much it Niel, unless you've got any other comments that you'd like to make.
NVW	Well, I think, obviously one can carry on talking for a long time on this, but I hope that you got out of it what you wanted and you are most welcome to ask any more questions, e-mail me or so on, but I do tend to run short on time.
RT	I appreciate you giving me your time, thank-you.
NVW	No, it's also been interesting talking to you, and its good to get other perspectives.
RT	Thank-you.
Interview ends: 12h55.	

	abstraction at that particular point and that is why we cannot over-allocate...
RT	And that will promote sustainability?
NVW	And that will promote sustainability. I think one can get more sophisticated, but that's up to where we can go now.
RT	OK, thanks. Then the water quality...will water quality measures apply to the whole basin...
NVW	Yes.
RT	The whole basin?
NVW	Ja.
RT	So if you have an area that's...that's quite a heavy agricultural area, and you have a very non-stressed area it's going to have the same water quality standard.
NVW	No, no, I think...OK, water quality is not my subject, but with water quality, you have to become more sophisticated and look at objectives for certain areas and so forth. If I say water quality guidelines apply to the whole catchment, yes, but not the same, you've got to tailor them according to the situation requirements, assimilative capacity, all sorts of things and even so, if you say a constituent causes harm, you must determine – what harm and will that sort of harm be a problem in that particular area, so you have to actually be very sophisticated, you have to get the various users together, or investigate the uses to quantify exactly what your problem is.
RT	So will that be taken care of by the basin study?
NVW	Not the basin study as such, but I think if you look in the resolution that is attached to the agreement, there are quite a number of actions that need to be taken. Some of these are getting people together to start developing actions, or standards etc, jointly between the countries.
RT	OK, and obviously that has to be monitored...the quality and other objectives have to be monitored.
NVW	Yes.
RT	How...what are the sort of basics of how that's going to be done, Niel, I understand that it's a massive issue, but if you can just give me an idea of how you're going to start going about implementing a monitoring system.
NVW	What we've done first of all is that we have identified certain critical sites, at this point in time, where monitoring has to be done. Now that is flow monitoring, water quality monitoring, so we have identified what you should monitor for, now that is only a start, obviously as things progress you can taking it further, but designing a monitoring process in itself is quite an art, so we've taken the first steps to see what can be done now within the capacities of the various countries and so forth, but this obviously will have to be taken further and developed as our knowledge improves, as the institutional situation develops etc..
RT	OK, so there is actually some scope at those sites, for that monitoring to be done by people or users, or communities at those sites, which will give them some input into the whole process.
NVW	Ja, although this is at this point in time call it very...top-down, monitoring I mean if you talk about communities, it's very difficult to so...for scientific monitoring to be done by communities etc.
RT	Oh, I'm not necessarily speaking about previously disadvantaged communities, I mean if there is an irrigation scheme or something there, they could do it, and also training can take place.
NVW	No that can already take place, but I would say the start of the whole process will be with the national means available through the various countries, but they've already started incorporating, you know big business etc. people who monitor get incorporated into the whole system etc., so there are links already.
RT	OK, then just on the Incomati Case Study draft document that you gave me.
NVW	Is that now Pieter van der Zaag?
RT	Yes, that one. I just wanted to ask you, when we last spoke you mentioned that "we" as in South Africa, disagree with some of the issues or aspects of this document, and I just wanted you to give me an idea what you disagree about.
NVW	OK, our main concern is that this document, and we must be careful because this is a draft, it's not a final document and we relayed our concerns to the authors, but my biggest concern on this particular document, OK first of all a general one, but this was written by people who are much more familiar with the Moçambican situation than the South African situation or the Swazi situation, so obviously it gives their perspective, it is not wrong, but it does not give the South African perspective or the Swazi perspective, so it can easily be understood as to be the general perspective, and here and there it is a bit critical towards other countries, so it's just that, ja, but it is just that...it's just one side of the coin, there is another side, or many times, you've got another side, that is not reflected, so that is one general comment that I can make. The other one is that...the technical interpretation of the Incomaputo agreement, there's a statement here made that this agreement allocates 30% more water than was previously allocated. Now, looking very cold, that is correct, but the point is it compares a situation of some time ago without any new water infrastructure in place, with the situation at present, so it does not recognise that steps were taken to actually provide more water out of the system, more utilisable water, so...and in a way, it can be seen as a discreditation of the agreement, because we actually

	went to great pains to see...to make sure that the water that is being allocated is actually available, and now the claim is made that it might not be available, what you cannot discount that notion, what they've tried to bring forward and that is that of stress, and that is quite true, because the assurance levels for certain users will in fact be less after the agreement than before the agreement, in order to achieve equity and so forth, so that gets a bit technical, but the point is we tried to apply...call it the same rules to each country, previously it did not and according to our investigations, according to our understanding of the system, everyone will be able to get their share if we manage properly, so we did not put something into place which cannot be achieved that was not the objective.
RT	So, those disagreements that you do have, how do you address them then, I mean with Moçambique? What kind of strength does a document like this (the Incomati Case Study draft document) have if you do disagree with it?
NVW	OK, can we just first get that it's not a disagreement with Moçambique, it's a question of informing the writers of this particular document, because the Moçambicans may very well have the same concerns as we have, I mean at least with the allocation of the water, maybe not to the nuances toward South Africa, Swaziland, Moçambique, but we have gone to...call it the...hierarchy of these people, providing from outside, this was sent to us for comment...just please see it in that sense, and we did comment, various people commented, at various levels, we actually looked at the document, compared it with our figures, numbers and so forth, and we sent extensive feedback to the authors.
RT	So will that be incorporated into the final document?
NVW	Well, I haven't seen the final document, hopefully it will be there because I've got an idea that this is being used, there is a course in Cape Town on cross-border conflict resolution, and next week there is one in Moçambique and we've got an idea that this is being used as the...call it the reference document for that particular course because the course is being organised by Pieter van der Zaag. There's also something similar in Delft next week, also with the same name PC>CP, ja, Potential Conflict to Cooperation Potential, now...
RT	But I haven't seen this particular document used on the net, I've seen the PC>CP thing, but this document is not referred to
NVW	Yes, therefore we just need to be careful how we deal with this particular document.
RT	No, I'm not using it for reference or anything like that, but I just wanted to get an idea of...when documentation like this does come out of a situation like the Incomati, how are other perspectives dealt with and if you do have comment...
NVW	Well, I think OK, there are two ways you can go about it, you can directly interact with the authors, bring it to their attention, and that can be effective before publication, after publication you can also deal with the authors, but then it's a <i>fait accompli</i> , but then you probably will have to counter with similar documents, or put together documents of your own or discussion documents about the subject, but then you have to go into, also into the public domain, to conferences or whatever, you've got to publish and discuss the issue at conferences I would think.
RT	So this is not output from the Joint Incomaputo Basin Study.
NVW	Most definitely not! No this is a private initiative, it's not official with any country, it's an academic document and I mean everybody's free to write whatever they want to, I would imagine that Pieter van der Zaag and Carmo Vaz, that they want to put professional product on to the table and...just a normal process...I don't think this was put together as an attack or anything of that sort, I don't think there's any ulterior motive with this.
RT	No it doesn't seem that way, it seems...
NVW	Well, personally I think it's a good document, it's a very good document.
RT	Ja, I think so too. Ja, obviously it's from different perspective, but they did send it to you for comment.
NVW	Ja, but they would like this document to have credibility, and I don't think they would like their document to be attacked by people involved in the situation afterwards and I think therefore they want to put a good product onto the table, but this is obviously limited to their understanding of the situation, their knowledge of the situation.
RT	But they've had feedback from DWAF?
NVW	Ja, we know these people very well, we've worked with them.
RT	I'm sure you have, I've seen their names come up quite often. OK, there's just one more. We discussed at our last meeting that the regional offices were aware of the provisions of the agreement. Since then I've had a meeting with Clive Arendse, and...well...I'll just give you the quote.
NVW	OK
RT	OK, and ask for your response, it's not nice, Niel, you're not going to like this.
NVW	Well, Clive's going to the States.
RT	I know, so I think he probably said more than he would've had he not been leaving at the end of the month,

	but the quote was "I didn't know what the implications are or anything, I haven't had any feedback on it at all, none. Maybe my director has, but he hasn't said anything to me about it" Now, I just wondered how you think the internal systems in DWAF can be improved to avoid situations like that. Do you think that's the situation with the Incomaputo agreement, because Clive has been deeply involved in that area and is supposed to handle the whole northern catchment.
NVW	No, I've got no problem with what Clive said and it is probably 100% correct...the point I think just is that people are extremely busy, and details of this particular document has been sent through to James Perkins, Joe Hansman, Laurence Sithole etc., but to be fair to them, they haven't got time to work through these things, all the implications, everything. They...it wasn't possible to do the development without their direct interaction, obviously, outside of it, people like myself know their situation fairly well etc. and that serves as an input from their side also, and it's for me, also part of my job to make sure that they do not get compromised or that whatever we do will not be of concern to them and if that does happen, then I speak to them, so it hasn't filtered down yet, not in the development, but now with the implementation, we've actually had a very high level meeting yesterday on the implementation of the particular agreement, and Laurence Sithole, who is the Regional Director, for the Mphumalanga and KwaZulu-Natal region, he has now been appointed as the leader of the task group to actually effect the implementation. The reason for that also is, is that it has been difficult to get the operations people of the Department involved in the process, so if we call them in now and make them responsible for the implementation, then they actually have to be involved in it, now I think as I told you before, especially on the KwaZulu-Natal side, it can be business as usual for a long time now, because the system is not stressed, so there's nothing that will be imposed on them that is now different from what is was before, but they will most definitely now, become more involved, because they've got to do the monitoring, making sure that the right releases are made, operating rules are developed and so on. So people at Clive's level will, in the future process, play an extremely important role.
RT	OK, that's great, Niel, that's all I needed to know, thanks.
NVW	It's actually a pity that they were not better in the know, but I think it's not only in this particular case, it is in general with a fair amount of work, really ambitious programmes that we do have and not, I'd say, sufficient resources to get all the communication in place, all of that, but I think as things normally go, I don't think we're doing that badly with the resources that we do have.
RT	Ja, I know there's always pressure from financial and other resources. Oh, sorry, when you...it was something that you said, that you sent the document through to Joe Hansman and to James Perkins, do they just get the documents?
NVW	No.
RT	Or do they get sort of a summary of the implications?
NVW	Look we do have communication within the department, and an important one for KwaZulu-Natal is the so-called Provincial Liaison Committee meetings, where Head Office officials, officials from KwaZulu-Natal, and also officials from the various departments within KZN, other government departments get together, and at such meetings for instance I keep them updated on what we are actually doing.
RT	OK, so it's not just that they then get a document which they then have to read and understand in their busy day?
NVW	No, we document, we table summaries sometimes, and so forth. That particular system doesn't work very well at the moment, I think we've had staff changes, and it will probably be reviewed, but that is the mechanism available for such communication and everybody who does not get sufficient information at a meeting like that for instance, they know who are the people involved, so they communicate outside of the meeting, but this addresses senior officials, now, you see the point is then it needs to go down, but then you see, you've got to rely on the judgement of James Perkins, Joe Hansman and so forth, because if they now reckon that this is important, then they will tell Clive, and internally, they've got very good communication.
RT	Ja, I know that Clive Arendse and James Perkins certainly have, but not for much longer I think, Clive's leaving at the end of the month, that's why I'm going to have a chat with Beason (Mwaka) today, but...um...ja, Niel, those were just the few issues that I wanted to clear up, just some about that (Incomati Case Study) and some other that I left out of our last long interview.
NVW	Ja, have you ever had any contact with Dirk Versveld?
RT	No.
NVW	Ja, he was quite involved with SEAs, Strategic Environmental Assessments, we've now, in some of our internal studies there are so many things going on, on the floodplain and so forth, that we're not quite sure of it all, we had a workshop with the Regional staff, Clive Arendse and others and so forth, but we will be using Dirk Versveld to now, have a look at the floodplain on our behalf, problems of it, see what sort of broad investigations need to be done, how can we link present initiatives together, just to get a bit of guidance as to where we are going, from a Strategic Environmental point of view.

RT	Well, I think then it's very important that he contact Cead, at the University of Natal, the Centre for Environment and Development, because I mean, just in the last year, we've done a lot of studies, but there's been a tremendous amount of study done in that area, and we've also just had a workshop up there, so I think it's quite important that he...Dr Joan Jaganyi is running the Water Research Commission project, there's also Charel Bruwer is running a short-term project.
NVW	We know about Charel's obviously.
RT	There was also Sue...her name's disappeared now, from the University of Western England, who did some work on it earlier in the year, Heeg and Breen, Charles Breen, who is the Head of Cead has obviously written an enormous amount about the ecology of the area.
NVW	Ja, I know he's been around there for a long time.
RT	Ja, so I think it's worth...if somebody's doing studies in the area, there's already a lot that's out there, so it might be worth contacting the Centre for Environment and Development.
NVW	Ja. Are you linked to them at the moment.
RT	I'm doing my Masters thesis, I'm in the Masters course.
NVW	And then, in normal life, what do you do?
RT	I don't know, I don't have a normal life, I work on this, that's all I do...no...um...ja, well, obviously next year, I'll be looking for work.
NVW	Well, I'd like to have your details, just for reference purposes.
RT	Sure Niel, ja, it's a very exciting area.
NVW	I want to send Dirk straight to you and say Dirk, ask this lady anything, she can tell you.
RT	Ja, I've spent quite a lot of time in this area now, I feel like I live there, and I'm in quite good contact with Clive Poultney, who does live there.
NVW	Ja, the two Clives...at least now that...what do you call it...mismatch will now be broken.
RT	Ja, they don't get on so well, but you know...I think Clive Poultney is quite difficult for many people to get on with, but he's very driven and very committed, and I think it's very difficult for him to deal with anybody who is not as committed to the area, I think he feels a little contemptuous of somebody who might not be as, what he feels is as committed as he is, but I think that's just borne out of...you know he's been there for 25 years, and he loves to stay there, so I think nobody else can quite match up to his commitment except maybe Charel.
NVW	No, it's unfortunately, I've only met him once, but people get so involved in particular situations that they just find it difficult to look at it objectively, from the bigger picture side.
RT	Ja. So there you go.
NVW	Now I don't know of how much use it will be for, OK, obviously not for your study, but we are now starting to investigate the formation of a River Basin Commission, and I think the first step that we'd like to investigate is the institutional situation, what have you got at the moment, what is required.
	At this point, tape stops, and the other side of the tape was inaudible, but it was simply wrapping up the discussion.
Interview ends: 10h00	

APPENDIX 3

BASIN-WIDE INTEGRATION AND COMMUNITY PARTICIPTION ASSESSMENT

BASIN-WIDE INTEGRATION AND COMMUNITY PARTICIPATION ASSESSMENT

These guidelines have been reproduced directly from the IUCN / African Development Bank booklet: Sahelian Floodplains, Challenges and Perspectives: Proceedings of the Regional Conference, Yamoussoukro, Côte d'Ivoire, 7 - 9 October 1999 (pp38-39).

1. GUIDELINES FOR BASIN-WIDE INTEGRATION

Integrated hydrographical basin management

- To determine the main obstacles to integrated hydrographical basin management and the promotion of the management / planning of hydrographical basin soil and water use and work to overcome these
- To develop consultative processes with the participation of the respective sectors and institutions in charge of water management, environmental protection and agriculture (at least) and a plan, at basin level, of water resource conservation, use and management
- To include wetland conservation in basin management in order to strengthen the management (water supply, flood management, pollution mitigation and biological diversity)
- To promote the protection and restoration of wetlands and their biodiversity within basins
- To develop well-conceived and socially acceptable mechanisms for cost sharing aimed at the distribution of the hydrographical basin management cost
- To promote the setting up of mechanisms designed to bring the groups involved together through basin management (governments, municipalities, water management bodies, teaching institutions, industries, farmers, local communities, NGOs etc) so that everybody participates in the management of the basin
- To promote relevant public education and awareness programmes

Development and strengthening of policies and legislation for integrated resource management

- To incorporate wetland management issues in existing water or hydrographical basin management policies and include water management issues in country policies
- To review the existing legislation and, as appropriate, develop new legislation to facilitate the implementation of key policy issues, such as the establishment of water councils and commissions; introduction of key incentives and deterrence measures; regulation of activities that could have harmful effects on water management

- To develop a water policy or a comprehensive basin management policy aimed at regulating the activities conducted in the basin and integrate wetland management in local plans
- To recognise that socio-economic development is often highly dependent on the protection of aquatic ecosystems, encourage different sectors to collaborate to allocate resources for the implementation of the policies and laws on integrated water resource management
- To develop incentives for the promotion of water conservation and allocate water resources more effectively and equitably

Setting up of hydrographical basin authorities and institutional capacity-building

- To set standards and objectives to be achieved and to determine the options and cost of the implementation of these objectives
- To ask joint authorities for basin management to prepare basin management plans
- The hydrographical basin management authorities should study, as necessary, the possibility of establishing cost-sharing formulas to collect the funds required for integrated basin management or request resources from the development aid community
- To develop mechanisms to facilitate resource transfer from beneficiaries downstream to the protection of upper watersheds and other regions of critical importance
- To provide training for water / wetlands managers to make them understand and apply the concepts of integrated management of water resources, river basins and wetlands
- To provide adequate financial resources to ensure effective operation of the organisations in charge of water resources planning and resource management, hydrographical basin management and wetland and, when required, request resources from other sources
- To strengthen and sustain the capacities of the institutions to undertake comprehensive evaluations of the water demand, taking account of the ecological requirements
- To strengthen the protection of the upper basin and other critical regions of the hydrographical basin by integrating them in protected area networks
- To promote the recruitment of staff with skills on wetland ecological functions from hydrographical basin management authorities

Evaluation and enhancement of the role of wetlands for water management processes

- The Scientific and Technical Evaluation Group (STEG) should collect information on biodiversity assessment methods so as to integrate these into wetland management and communicate the information to Parties for them to adapt these to the local context
- To conduct studies to determine the functions of, and benefits drawn from wetlands as they concern water management in every hydrographical basin. With these results, the Parties should protect the remaining wetlands through prompt action when necessary
- To envisage the restoration of degraded wetlands and the creation of new wetlands within hydrographical basins
- To ensure the inclusion into watercourse management schemes, of non-structural flood management measures that build on the natural functions of the wetlands to complement or replace existing flood networks

Identification of the current and future water demand

- To evaluate current and future water resource supply and demand in a basin so as to meet the ecological and human needs and determine areas of shortage and possible conflict
- To undertake evaluations to determine the economic and social costs in case the water requirements are not met
- To develop informed water demand management and pricing strategies that help sustain the functions and ecological values of water resources and wetlands
- To study encouraging measures and inappropriate incentives, plan the elimination of actions that lead to the depletion / degradation of wetlands; introduce or strengthen measures that encourage the restoration and sound use of wetlands

To mitigate the impacts of land development projects on wetlands and their diversity

- To develop integrated land occupation plans for each hydrographical basin
- To develop and implement adapted regulations for the control of activity sectors, in particular forestry, agriculture, mining and urban waste management
- To conduct Environmental Impacts Assessments (EIA) and Cost-Benefit Analyses (CBA) for projects and examine alternative solutions including the “do nothing” option
- To communicate the findings of any EIA or CBA in a form that is easily understandable

- To ensure that the relevant control and mitigation measures are taken to limit or repair the impacts when development projects are approved

Reduction of the impact of water development projects on wetlands

- To act in such a way that water development project proposals are carefully assessed from the beginning so as to determine whether non-structural alternative solutions could be envisaged or advised
- To take all necessary measures to mitigate the impact of water development projects on the biological diversity and socio-economic benefits during the construction and long-term operation of the infrastructure
- To act in such a way that the project planning / design process includes a step-by-step process integrating environmental issues
- From the first steps of project preparation, integrate considerations on the long-term benefits and social costs in the process
- Using this information to establish optimum discharge regimes to preserve wetlands
- When the available information on biological and physical parameters of the biotope is inadequate to reach a final decision on the required optimum discharge, use the precautionary principle

To develop sustainable water allocation plans for the various users of the resource in the hydrographical basin, not forgetting the allocation of water for wetland preservation

- To regulate and monitor the impacts of large-scale infrastructure building projects (embankments, roads, overflow channels and small dams) undertaken on a river and drainage channels

Protection and restoration of wetlands and their diversity

- To evaluate in each hydrographical basin, the state of wetlands and their biodiversity and take the necessary action to enhance preservation measures
- Parallel to the evaluation in each hydrographical basin of the state of wetlands; envisage the recording of key sites in the list of Wetlands of International Importance
- To ensure that the Ramsar sites management plans take into account possible impacts outside the sites and from inside the basin, as well as issues relating to the site itself
- To study and, if necessary, modify the biological conservation rules of wetlands in order to protect endangered species and protect the overexploitation of more prevalent ones

Partnerships with the relevant conventions, organisations and initiatives

- To ensure that the present guidelines are publicised with international conventions, organisations and programmes
- To facilitate close coordination at the country level, between the Ramsar Administrative Authorities and the correspondents of other international conventions and agreements in the same area
- To ensure, as appropriate, the inclusion of issues relating to wetlands in the implementation of all regional agreements on shared hydrographical basins and water resources

2. ASSESSMENT OF LOCAL AND INDIGENOUS PEOPLE'S PARTICIPATION

The following is a short, non-exhaustive checklist of indicators that can help to assess the level of local and indigenous people's participation

INCENTIVES

- The local and indigenous people have found economic and other benefits in sound natural resource management of wetlands
- The government organisation has outlined the policies supporting participatory management
- Legal and financial incentives that are adapted to participatory management have been established
- More equitable sharing of benefits has resulted from the participatory management process
- Stakeholders are satisfied with their participation in the process

CONFIDENCE

- There is a policy or clear and widely known legislation facilitating the participation of local and indigenous people
- All stakeholders (the government in particular) recognise participatory management as being legitimate and desirable
- The local and indigenous people really participate in the decision-making process henceforth
- Local organisations that support participatory management are respected
- The representatives of the local people are really representative and accountable persons
- The resource use and participation rules fit into the local context
- Stakeholders have concluded a management agreement (oral or written, formal or informal)
- The limits of the management agreement and parties to the agreement are clearly defined
- The management agreement specifies the functions, rights and duties of the parties

- The management agreement has been approved at least by the stakeholders using the resources and by the major decision-making groups
- The parties to the agreement meet their obligations
- A system of scaled penalties for breaking the rules was agreed between the parties
- Resource management rules appear to be applied

FLEXIBILITY

- The parties affected are able to collectively modify the rules of resource use
- A set of management units is in place (different organs at different levels)
- The local and indigenous people can evidently influence the pace and direction of changes depending on the resources that are of interest to them
- Facilitators / coordinators apply the "learning by doing" method and adaptive management

EXCHANGING KNOWLEDGE AND BUILDING CAPACITY

- Awareness of stakeholders of the new management method can be ascertained
- There is a flow of information and communication between the local and indigenous people and the relevant government organisations and vice versa
- Information reaches the local people in a form that is easily understood
- The local and indigenous people participate in continuous site surveillance and assessment of the participation process
- The major government organisations obviously respect the local social systems and local ecological knowledge
- Stakeholders have proven skills and the required responsibilities
- The evaluation methods established by stakeholders serve to determine the level of participation expected and contribute to improving the wise use of wetlands

CONTINUITY

- There is at least one organised structure that facilitates the participation of the local and indigenous people, for example, a council, a management body, a women's group etc.
- A random sampling of the local and indigenous people helps to determine the role of the community in wetland management and the individuals directly concerned can describe the reason for their participation

- The government organisation and its staff have demonstrated their commitment to participatory management and can accurately describe the goal of local people's participation
- There is a long-term funding source for participation and management
- The local and indigenous people have provided support in kind (time, labour, traditional knowledge and expertise) for the implementation of the participatory management agreement
- There is integration between management of the wetland and management of the watershed

APPENDIX 4

INTERIM INCOMAPUTO AGREEMENT

**TRIPARTITE INTERIM AGREEMENT BETWEEN
THE REPUBLIC OF MOZAMBIQUE
AND
THE REPUBLIC OF SOUTH AFRICA
AND
THE KINGDOM OF SWAZILAND
FOR CO-OPERATION ON THE PROTECTION AND SUSTAINABLE UTILISATION OF THE WATER RESOURCES OF
THE INCOMATI AND
MAPUTO WATERCOURSES**

PREAMBLE

The Republic of Mozambique, the Republic of South Africa and the Kingdom of Swaziland (hereinafter jointly referred to as the "Parties");

BEARING IN MIND the principles advocated in the Declaration by the Heads of State or Government of Southern African States "Towards the Southern African Development Community" and the Treaty of the Southern African Development Community signed on 17 August 1992 and the Revised Protocol on Shared Watercourses in the Southern African Development Community signed on 7 August 2000;

HAVING RESOLVED to pursue the guidelines established by the Agreement between the Government of the Republic of South Africa and the Government of the Republic of Portugal in regard to Rivers of Mutual Interest and the Cunene River Scheme signed on 13 October 1964, to which the Republic of Mozambique succeeded in 1975 and the Kingdom of Swaziland acceded to in 1967;

MINDFUL of the spirit of co-operation and good understanding reached by the implementation of the Piggs Peak Agreement of 15 February 1991;

TAKING INTO ACCOUNT the modern principles and norms of International Law as reflected in the Convention on the Law of the Non-Navigational Uses of International Watercourses adopted by the General Assembly of the United Nations on 21 May 1997;

CONSCIOUS of the mutual advantages of concluding agreements on co-operation on shared watercourses;

DETERMINED to co-operate and seek mutually satisfactory solutions for the needs of the Parties towards water protection and to the sustainable utilization and development of the water resources with a view to improving the standard of living of their populations;

EXPRESSING the common desire to proceed with sustainable development on the basis of Chapter 18 of Agenda 21, adopted by the United Nations Conference on Environment and Development on 14 June 1992;

RECOGNISING that the Parties need to agree on water use in the shared watercourses to enable sustainable development;

MINDFUL of the fact that good relationships between the people and the governments of the Parties, good neighbourliness and mutual respect, will contribute to the improvement of co-operation on the protection and utilization of waters for the benefit and the welfare of their populations;

TAKING into consideration the interim nature of this Agreement;

HEREBY AGREE as follows:

Article 1

Definitions

For the purposes of this Agreement the following terms shall have the meanings ascribed to them hereunder:

“catchment” means an area through which any rainfall will drain into the watercourse through surface flow to a common point;

“emergency situation” means a situation that causes or poses an imminent threat of causing serious harm to the Parties and which results suddenly from natural causes, such as torrential rains, floods, landslides or earthquakes, or from human conduct;

“environmental impact assessment” means a national procedure for evaluating the likely impact of a planned measure on the environment;

“impact” means any effect on the environment caused by an activity; such effects on the environment include effects on human health and safety, flora, fauna, soil, air, water, climate, landscape, socio-economic environment or the interaction among these factors and cultural heritage or socio-economic conditions resulting from alterations to these factors;

"Incomati watercourse" means the system of the Incomati River, which includes the tributaries Mazimechopes, Uanetze, Massintonto, Sabie, Crocodile, Komati Rivers and the estuary;

"Maputo watercourse" means the system of the Maputo River, which includes the tributaries Pongola and Usuthu Rivers and the estuary;

"ministers" means Ministers responsible for the water affairs of the Parties;

"ongoing activity" means any activity that would have been subjected to a decision of a competent authority in accordance with an applicable national procedure if it had been a planned measure;

"Piggs Peak Agreement" means the agreement reached at the Tripartite Ministerial Meeting of Ministers Responsible for Water Affairs, signed in Piggs Peak on 15 February 1991;

"planned measure" means any activity or a major change to an ongoing activity subject to a decision of a competent authority in accordance with applicable national procedures;

"pollution" means any detrimental alteration in the composition or quality of the waters of a shared watercourse, which results directly or indirectly from human conduct;

"Protocol" means the Revised Protocol on Shared Watercourses in the Southern African Development Community signed on 7 August 2000 in Windhoek;

"sustainable development" is development which meets the needs of present generations without compromising future generations to meet their own needs;

"TPTC" means the Tripartite Permanent Technical Committee established by the Agreement between the Government of the Republic of South Africa, the Government of the Kingdom of Swaziland and the Government of the People's Republic of Mozambique relative to the establishment of the Tripartite Permanent Technical Committee, signed in Pretoria on 17 February 1983;

"transboundary impact" means any adverse effect, caused by human conduct, within an area under the jurisdiction of a Party caused by a proposed activity, the physical origin of which is situated wholly or in part within the area under the jurisdiction of another Party;

"watercourse" means a system of surface and ground waters constituting by virtue of their physical relationship a unitary whole normally flowing into a common terminus such as the sea, lake or aquifer.

Article 2
General Objective

This Agreement aims to promote co-operation among the Parties to ensure the protection and sustainable utilisation of the water resources of the Incomati and Maputo watercourses.

Article 3
General Principles

For purposes of this Agreement, the general principles of the Protocol shall apply, especially-

- (a) sustainable utilization principle;
- (b) equitable and reasonable utilisation and participation principle;
- (c) prevention principle; and
- (d) co-operation principle.

Article 4
Responsibilities of the Parties

The Parties shall, individually and, where appropriate, jointly, develop and adopt technical, legal, administrative and other reasonable measures in order to-

- (a) prevent, reduce and control pollution of surface and ground waters, and protect and enhance the quality status of the waters and associated ecosystems for the benefit of present and future generations;
- (b) prevent, eliminate, mitigate and control transboundary impacts;
- (c) co-ordinate management plans and planned measures;
- (d) promote partnership in effective and efficient water use;
- (e) promote the security of relevant water related infrastructures and prevent accidents;
- (f) monitor and mitigate the effects of floods and droughts;

- (g) provide warning of possible floods and implement agreed upon urgent measures during flood situations;
- (h) establish comparable monitoring systems, methods and procedures;
- (i) exchange information on the water resources quality and quantity, and the uses of water;
- (j) promote the implementation of this Agreement according to its objectives and defined principles;
- (k) implement capacity building programmes in accordance with Article 14; and
- (l) co-operate with the SADC organs and other shared watercourse institutions.

Article 5

Shared Watercourses Institution

- (1) The joint body for co-operation between the Parties shall be the TPTC.
- (2) The TPTC shall exercise the powers established in this Agreement, as well as those conferred by the Parties, in order to pursue the objectives and provisions established herein.
- (3) For the purpose of implementation of this Agreement the TPTC shall meet at least twice a year.
- (4) The official working languages for the purpose of implementation of this Agreement shall be English and Portuguese.
- (5) After the entry into force of this Agreement, the TPTC shall adopt, by consensus, rules of procedure which will govern its meetings. Until such rules of procedure are adopted by the TPTC, those contained in the TPTC Agreement shall govern such sessions of the TPTC, taking into account the provisions of subArticles (3) and (4).

Article 6

Protection of the Environment

- (1) The Parties shall, individually and, where appropriate, jointly, protect and preserve the aquatic environment of the Incomati and Maputo watercourses, taking into account generally accepted international rules and standards.
- (2) The Parties shall, individually and, where appropriate, jointly, take all measures to protect and preserve the ecosystems of the Incomati and Maputo watercourses.
- (3) The Parties shall take all measures necessary to prevent the introduction of species, alien or new, into the

Incomati and Maputo watercourses, which may have effects detrimental to the ecosystems of the watercourses resulting in significant harm to other Parties.

Article 7

Sustainable Utilisation

- (1) The 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 watercourses, taking into account the interests of the other Parties concerned, consistent with adequate protection of the watercourses for the benefit of present and future generations.
- (2) The Parties shall co-ordinate their management activities by-
 - (a) the exchange of information on their respective experiences and perspectives; and
 - (b) the co-ordination of management plans, programmes and measures.
- (3) In pursuing the objective of this Article, the Parties shall follow the flow regimes stipulated in Annex I as determined according to Article 9.
- (4) In further pursuance of the objective of this Article the Parties disclose in Annex II their intentions of developing new projects that fall outside the scope of Annex I during the period of validity of this Agreement.
- (5) The Parties are committed to develop measures towards improvement of efficiency and rational use of water and its conservation and to promote more efficient water use through adopting better available technology.

Article 8

Water Quality and Prevention of Pollution

- (1) In order to protect and conserve the water resources of the Incomati and Maputo watercourses, the Parties shall, through resolutions adopted by the TPTC, and, when appropriate, through the co-ordination of management plans, programmes and measures, proceed to-
 - (a) endeavour to develop an evolving classification system for the water resources of the Incomati and Maputo watercourses;
 - (b) classify and state the objectives and criteria in respect of water quality variables to be achieved through the agreed classification system for the water resources;

- (c) adopt a list of substances the introduction of which, into the water resources of the Incomati and Maputo watercourses, is to be prohibited or limited, investigated or monitored;
 - (d) adopt techniques and practices to prevent, reduce and control the pollution and environmental degradation of the Incomati and Maputo watercourses that may cause significant harm to the other Parties or to their environment, including human health and safety, or to the use of the waters for any beneficial purpose, or to the living resources of the watercourses; and
 - (e) implement a regular monitoring programme, including biological and chemical aspects for the Incomati and Maputo watercourses and report, at the intervals established by the TPTC, on the status and trends of the associated aquatic, marine and riparian ecosystems in relation to the water quality of the said watercourses.
- (2) Until such time that water quality objectives and criteria are determined, the Parties shall comply with the provisions of the Resolution of the TPTC on Exchange of Information and Water Quality. The Resolution may be reviewed by the TPTC from time to time.

Article 9

Flow Regimes

- (1) The agreed flow regime of the Incomati watercourse is contained in Annex I, which complements the flow regime as determined in the Piggs Peak Agreement, and the agreed flow regime of the Maputo watercourse is contained in the same Annex.
- (2) Any abstraction of waters from the Incomati or Maputo watercourses, regardless of the use or geographic destination of such waters, shall be in conformity with the flow regimes of Annex I and relevant provisions of this Agreement and its Annexes.
- (3) The Parties have considered the following criteria in establishing the flow regimes contained in Annex I:
 - (a) The geographic, hydrological, climatic and other natural characteristics of each watercourse;
 - (b) the need to ensure water of sufficient quantity with acceptable quality to sustain the watercourses and their associated ecosystems;
 - (c) any present and reasonably foreseeable water requirements, including afforestation;

- (d) existing infrastructure which has the capacity to regulate streamflow of the watercourses; and
 - (e) agreements in force among the Parties.
- (4) The following short to medium term water requirements of each of the Parties are recognised in particular:
- (a) The strategic importance to Mozambique of augmenting the water supplies to the city of Maputo and its metropolitan area from one or both of the Incomati and Maputo watercourses;
 - (b) the importance to Swaziland of developing the Lower Usuthu Smallholder Irrigation Project in the Usuthu River catchment; and
 - (c) the importance to South Africa of establishing and developing emerging irrigation farmers in the Incomati River catchment.
- (5) The additional water requirements of the city of Maputo, for which additional water must be secured, have been reserved in Annex I.

Article 10
Droughts and Floods

- (1) The Parties undertake to co-ordinate their actions within six months to one year and to develop measures to mitigate the effects of droughts and floods.
- (2) The flow regimes of the Incomati and Maputo watercourses during flood and drought periods shall be adjusted in accordance with the measures referred to in subArticle (1).
- (3) The Parties shall notify each other without delay and by the most expeditious means of any flood danger.
- (4) During flood alarm situations, the affected Party may require the other Parties to adopt the measures referred to in subArticle (1) and any other urgent measures agreed upon, which may be deemed necessary.
- (5) During a drought period, the Parties shall be obliged to manage, in a co-ordinated manner, water storage infrastructure in accordance with the measures referred to in Sub-Articles (1) and (2).

Article 11

Incidents of Accidental Pollution and Other Emergency Situations

- (1) The Parties shall, without delay and by the most expeditious means available, notify other potentially affected Parties, the SADC organs or any other authorized institutions and competent international organisations of any incidents of accidental pollution and other emergency situations originating within their respective territories and shall promptly supply the necessary information to such affected Parties and competent organisations with a view to co-operate in the prevention, mitigation and elimination of the harmful effects of the emergency.
- (2) The Parties shall, individually and, where appropriate, jointly, develop contingency plans for responding to any incidents of accidental pollution and other emergency situations in co-operation, where appropriate, with other potentially affected Parties and competent international organisations, to take immediately all practicable measures necessitated by the circumstances to prevent, mitigate and eliminate the harmful effects of the emergency.

Article 12

Exchange of and Access to Information

- (1) The Parties shall, within the TPTC, exchange available information and data regarding the hydrological, geohydrological, water quality, meteorological and environmental condition of the Incomati and Maputo watercourses to enable planning, development and management of these shared watercourses.
- (2) The Parties shall exchange data, information and study reports on the activities that are likely to cause significant transboundary impacts.
- (3) To enable compliance with subArticle (2), the polluting substances subject to special attention shall be as agreed in the Resolution and regularly reviewed by the TPTC.
- (4) The Parties shall exchange information and consult each other and if necessary, negotiate the possible effects of planned measures on the condition of the Incomati and Maputo watercourses. The Parties shall employ their best efforts to collect and where appropriate, to process data and information in a manner, which facilitates its utilisation by the other Party to which it is communicated.
- (5) If a Party is requested by another Party to provide data or any information in subArticles (1) and (2), and that information is not readily available, it shall employ its best efforts to comply with the request but may condition its compliance upon payment by the requesting Party of the reasonable costs of collecting and where appropriate processing such data or information.

- (6) The Parties shall provide one another, at intervals agreed to by the TPTC, information on the use, quantity and quality of the water resources and the ecological state of the Incomati and Maputo watercourses necessary for the implementation of this Agreement.
- (7) The Parties shall develop the appropriate measures to ensure that the information is homogeneous, compatible and comparable, as agreed by the TPTC.
- (8) The Parties shall create the necessary conditions to ensure that, in conformity with applicable domestic law or International Law, information on matters covered by this Agreement is available to whoever makes a reasonable request.

Article 13

Transboundary Impacts

- (1) Planned measures listed in Annex II, regardless of their location, that by themselves or by accumulation with the existing ones, have the potential of a significant transboundary impact on the watercourse, shall not commence before the provisions of Article 4(1) of the Protocol are complied with.
- (2) Whenever, a planned measure, not listed in Annex II, is likely to cause a significant transboundary impact or any of the Parties expresses concern that such may occur, it shall not commence before the provisions of Article 4(1) of the Protocol are complied with.
- (3) In case of a planned measure involving significant transboundary impact of substantial magnitude the Parties shall conduct an environmental impact assessment, which takes transboundary impact into account in accordance with procedures determined by the TPTC.
- (4) Whenever an ongoing activity causes or is likely to cause a significant transboundary impact, which will lead the Party to fail to comply with an obligation under Articles 4, 8 or 9, the national procedures on the subject shall apply and the Parties concerned shall endeavour to address the matter through the co-ordination of management plans, programmes or measures.

Article 14
Capacity Building

- (1) The TPTC shall -
 - (a) identify capacity building programmes necessary for the implementation and monitoring of this Agreement; and
 - (b) prioritise the capacity building programmes for implementation.
- (2) The Parties shall, individually and, where appropriate, jointly, be responsible for ensuring that capacity is developed in their respective States and in the shared basins to effectively implement this Agreement.

Article 15

Settlement of Disputes

- (1) Any dispute between the Parties concerning the interpretation or implementation of this Agreement shall be settled amicably through consultation and negotiations between the Parties.
- (2) Where the dispute has not been settled within one year, from the date upon which such negotiations were requested, it may be submitted to arbitration by either Party. If the disputing parties do not agree on the subject matter of the dispute, the arbitral tribunal shall determine the subject matter.
- (3) The arbitration shall operate according to the following rules:
 - (a) The number of arbitrators shall amount to a total of three.
 - (b) The Parties initiating the arbitration shall appoint one arbitrator and the other Party or Parties shall appoint one other arbitrator. The aforesaid two arbitrators shall jointly designate a third arbitrator who shall chair the arbitral tribunal.
 - (c) The arbitrators shall be appointed within a three-month period. Should the time limit elapse and any one of the disputing parties have not appointed any arbitrator, the arbitrator shall be appointed by the President of the SADC Tribunal at the request of a Party. Pending the establishment and entering into operation of the SADC Tribunal the aforementioned appointment shall be made by the President of the International Court of Justice.
 - (d) In case of a dispute between the arbitrators designated by the disputing parties as to the designation,

within two months, of the final arbitrator, the latter shall be designated by the President of the SADC Tribunal at the request of a Party. Pending the establishment and entering into operation of the SADC Tribunal the aforementioned designation shall be made by the President of the International Court of Justice.

- (e) Based on International Law and in particular on the basis of this Agreement, the rules of procedure to be followed by the arbitral tribunal shall be decided by the tribunal, who shall also determine the distribution between the disputing parties of the costs of the arbitration.
- (f) The arbitral tribunal shall render its decisions in accordance with the provisions of this Agreement and International Law.
- (g) The arbitral tribunal may, at the request of one of the disputing parties, recommend interim measures of protection.
- (h) Decisions of the arbitral tribunal, both on procedure and substance, shall be taken by a majority vote of its members.
- (i) The arbitral award shall be submitted in writing and shall be signed by all arbitrators.
- (j) The arbitral award shall be final and binding.

Article 16

Annexes

The Annexes are an integral part of this Agreement. Annexes I, II, III, IV and V can be modified by a decision of the Ministers upon recommendation by the TPTC.

Article 17

Existing Watercourse Agreements

The stipulations of existing bilateral and trilateral agreements among the Parties concerning the present subject (Annex IV) will remain in force as far as they are not in conflict with this Agreement.

Article 18

Entry into Force, Termination and Amendments

- (1) This Agreement shall enter into force on the date of the last notification to the Depositary of this Agreement of the fulfilment of the internal procedure for the conclusion of international agreements.
- (2) This Agreement shall remain in force until 2010 or until superseded for the relevant watercourse by comprehensive water agreements on the Incomati and Maputo watercourses supported by joint studies, whichever is the earlier. The Parties shall adhere to the time frames set out in Annex V.
- (3) This Agreement may be amended at any time by mutual consent of the Parties, by an exchange of notes between the Parties through the diplomatic channels. The date of entry into force shall be the date of the last notification.

Article 19

Depositary of the Agreement

- (1) **The Republic of Mozambique shall be the Depositary of this Agreement.**
- (2) **The Depositary of this Agreement shall perform the following functions:**
 - (a) Inform the Parties of instruments of ratification, withdrawal or termination or of any other information or declarations relevant to this Agreement;
 - (b) inform the Parties of the date of the entry into force of this Agreement;
 - (c) register this Agreement with the Secretariat of the United Nations and with the SADC Secretariat; and
 - (d) send certified copies of the authentic texts of this Agreement and other relevant documents to the Parties.

IN WITNESS WHEREOF the undersigned, being duly authorised by their respective Governments, have signed and sealed this Agreement in triplicate, in the English and Portuguese languages, all texts being equally authentic.

Signed at *Johannesburg* on this *29th* day

of the month of *August* 2002

Minister Roberto Costley-C. White

For the Republic of Mozambique

Hon Magwagwa BE Mdluli

For the Kingdom of Swaziland

Minister Ronnie Kasrils

For the Republic of South Africa

COMPONENT B

**TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO
MAPUTO**

by

ROBYN TOMPKINS

**Submitted in partial fulfillment of the requirements for the degree of
Master of Environment and Development
at the
Centre for Environment and Development
School of Applied Environmental Sciences
University of Natal**

**Pietermaritzburg
2002**

CONTENTS	Page
1. Introduction	1
i) Physical description of the area of study	2
2. Aim and objectives	2
3. Methodology	3
i) Conceptual framework	3
ii) Interviews	3
iii) Interview analysis	5
iv) Community participation and basin-wide integration assessment	5
4. International water law	7
5. Transboundary basin management analysis	8
i) What, therefore, must change in transboundary water agreements?	13
6. International water law and the application of human rights through collaborative management	16
7. Stakeholder analysis of the Pongolo floodplain	18
8. Assessment of basin-wide integration and community participation in the area of study	22
i) Integrated basin management assessment	22
ii) Community participation assessment	24
9. Discussion	25
i) Key stakeholders in a floodplain management organisation	25
a) Government departments	25
b) Conservation organisations	25
c) Floodplain communities	25
d) Commercial stakeholders	26
e) Moçambique	26
ii) Transboundary basin management	28
iii) Floodplain management	31
iv) A strategy for sustainable resource use	33

a) Power relations between states	33
b) Power relations within states	33
c) Environmental management	35
10. Conclusion	35
11. Recommendations	36
12. Acknowledgements	37
Appendix 1: List of interviewees	
Appendix 2: Tabular analysis of international transboundary agreements	
Appendix 3: Tabular analysis of interviews	
Appendix 4: Tabular assessment of basin-wide integration	
Appendix 5: Tabular assessment of community participation	
Appendix 6: Questions for Francisco Alvaro	

LIST OF ABBREVIATIONS

AfDB	African Development Bank
DAEA	Department of Agriculture and Environmental Affairs
DEAT	Department of Environmental Affairs and Tourism
DNA	Direcção Nacional de Aguas
DOH	Department of Health
DWAF	Department of Water Affairs and Forestry
ELMS	Environment and Land Sector (in SADC)
NWA	Republic of South Africa, National Water Act No. 36 of 1998
EIA	Environmental Impact Assessment
GCI	Green Cross International
GIS	Geographic Information Systems
GM	Genetically Modified
GSLWP	Greater St Lucia Wetland Park
IBWC	International Boundary and Water Commission
ICPR	International Commission for the Protection of the Rhine
IDP	Integrated Development Plan
IJJWC	Israel-Jordan Joint Water Commission
IUCN	The World Conservation Union
KZN	KwaZulu-Natal
LWWP	Lubombo Water Ways Programme
LSDI	Lubombo Spatial Development Initiative
MRS	Makhatini Research Station
NGO	Non-governmental Organisation
OKACOM	Okavango River Basin Commission
POWADETA	Pongolo Water Association for the Development of Traditional Agriculture
RMCC	Regional Malaria Control Council
SADC	Southern African Development Community

SAWEG	Sahelian Wetlands Expert Group
TDA	Transboundary Diagnostic Assessment
TPTC	Tripartite Permanent Technical Committee
UN	United Nations
ZACPLAN	The Zambezi River Action Plan
ZRA	Zambezi River Authority

LIST OF FIGURES

	Page
3.1 Conceptual framework	4
8.1 Basin-wide integration assessment (actual, maximum and actual / maximum % scores)	23
8.2 Community participation assessment (actual, maximum and actual / maximum % scores)	24
9.1 Population and infrastructure in southern Moçambique	27
9.2 Organisational structure for a floodplain management organisation	29
9.3 A strategy for sustainable resource use	34

LIST OF TABLES

Table		Page
4.1	Institutional agreements selected for analysis	10
4.2	Condensed analysis of selected transboundary river basin agreements	11
7.1	Stakeholder analysis of the Pongolo floodplain	19

"Here is a [world] where life is written in water"

THOMAS HORNSBY FERRIL (1896-1988), "HERE IS A LAND WHERE LIFE IS WRITTEN IN WATER"

1. INTRODUCTION

"The world's disparate cultures are linked by a factor common to all of us: dependence on water" (Dowdeswell 1998:13). Scientists, environmentalists, researchers and poets describe water as "life", and yet, only 2.5% of all the water in the world is fresh water (Kuylenstiera & Najlis 1998). The finite nature and uneven distribution of the earth's fresh water resources imparts a darker aspect to water in the modern, overpopulated world, however, that of power and conflict over water in the world's some 300 international river basins (Green Cross International (GCI) 1999). Given that nearly half of the land in the world (excluding Antarctica) falls within international river basins (Dowdeswell 1998), sustainable use of water represents a significant challenge to humanity, in which the prize is survival.

The "disparate cultures" to which Dowdeswell (1998) refers play a significant role in what is likely to be a defining factor in human development in the twenty-first century: sustainable use of the earth's water resources. Gleick (1998:574) defines the sustainable use of water as

"the use of water that supports the ability of human society to endure and flourish into the indefinite future without undermining the integrity of the hydrological cycle or the ecological systems that depend on it"

However, the layers of complexity that underpin that definition can be found in the diversity of "human society", which is divided by political, social, cultural and economic boundaries. The criteria for sustainable use of water outlined by Dowdeswell (1998) and Gleick (1998) advocate above all, the concept of 'fair share' of water across all nations and within them. To this end, various legal instruments at international, regional and local levels have been instituted. Few have proved adequate in addressing the problem. Interpretations of national sovereignty, and the strategic necessity of water have generated conflicts over water across borders around the world.

This paper is concerned with the Pongolo River / Rio Maputo, in the area known as the Maputaland plain, which stretches from the foot of the Lebombo Mountains in South Africa, to the Bay of Maputo in Moçambique. A transboundary agreement, which includes the Maputo basin, was signed on 29th August

2002. This paper outlines the critical elements of the management of this area, related to a strategy for sustainable resource use, in the context of new directions in international water resource management.

i) Physical Description of the study area

From its source in Wakkerstroom, Mphumalanga, South Africa, some 2200m above mean sea level (Heeg & Breen 1994), the Pongolo River flows eastward through a narrow gorge between the Lebombo and Ubombo Mountain ranges, where it turns northward on the Maputaland Plain. The river forms the Pongolo floodplain and pan system for approximately 100km where, the Pongolo joins the Usuthu River, which forms the South Africa / Moçambique border. The river becomes the Rio Maputo, which continues northward until it reaches the Indian Ocean on the southern arc of the Bay of Maputo

2. AIM AND OBJECTIVES

i) Aim

To establish the critical elements of effective transboundary water resource management of the Pongolo River/Rio Maputo.

ii) Objectives

- To examine current trends in international transboundary water resource management theory and new directions in its application
- To identify and assess selected existing regional and international transboundary communication or resource management structures
- To identify existing resource management and institutional structures in South Africa and Moçambique in the area of study
- To identify the stakeholders and water uses of the Pongolo River / Rio Maputo in South Africa and Moçambique
- To assess the legislative, cultural and logistical constraints to or benefits for water resource management of the Pongolo River/Rio Maputo
- To determine the key participants of a management structure for the Pongolo River/Rio Maputo
- To provide recommendations for water control authorities in this area of the basin
- To indicate areas for further research

3. METHODOLOGY

Following preliminary readings in transboundary water resource management theory, a conceptual framework was developed to guide a literature review. Documents since 1996 have been used given the developments in transboundary management, and current changes in natural resource management thinking. A literature review was conducted to assess policy and legislation application in practice in water management internationally, regionally and locally.

i) Conceptual framework

Figure 3.1 describes the conceptual framework, which, although it does not advocate a specific theory, is grounded in the idea that collaborative management based on human rights principles is critical to effective transboundary management (Glieck 1999; Mohammed-Katerere 2001).

This framework is two-tiered in that it comprises both elements of legislation and management systems theory, which have been used to inform the development of existing transboundary agreements and management organisations. The practical application of those systems in the area of study, which comprise the second tier of the conceptual framework, will be assessed according to the series of suggestions as to what should change about transboundary management systems, which have arisen from analysis of existing transboundary organisations (Appendix 2).

ii) Interviews

Data and information gathered from interviews (Appendix 1) has been analysed according to the method of grounded theory, which can be described as “theory that is built from data grounded in the data” (Neuman 2000:146). Because the complexities and wider dimensions of transboundary water management must be considered and related to the study area, the interviewees selected are not from a homogenous group. Therefore, a varied range of stakeholders, types and levels of expertise and disciplines require integration in this research. Different questions have been asked of each interviewee, according to their expertise and activities, therefore the interpretation of the interviews has been made according to the themes set out in the conceptual framework (Figure 3.1), in order to synthesise some of the primary concerns of this complex area of study. As a result of this, and the highly qualitative nature of the data, the researcher has developed the methodology for data analysis according to the conceptual framework as follows.

TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO MAPUTO

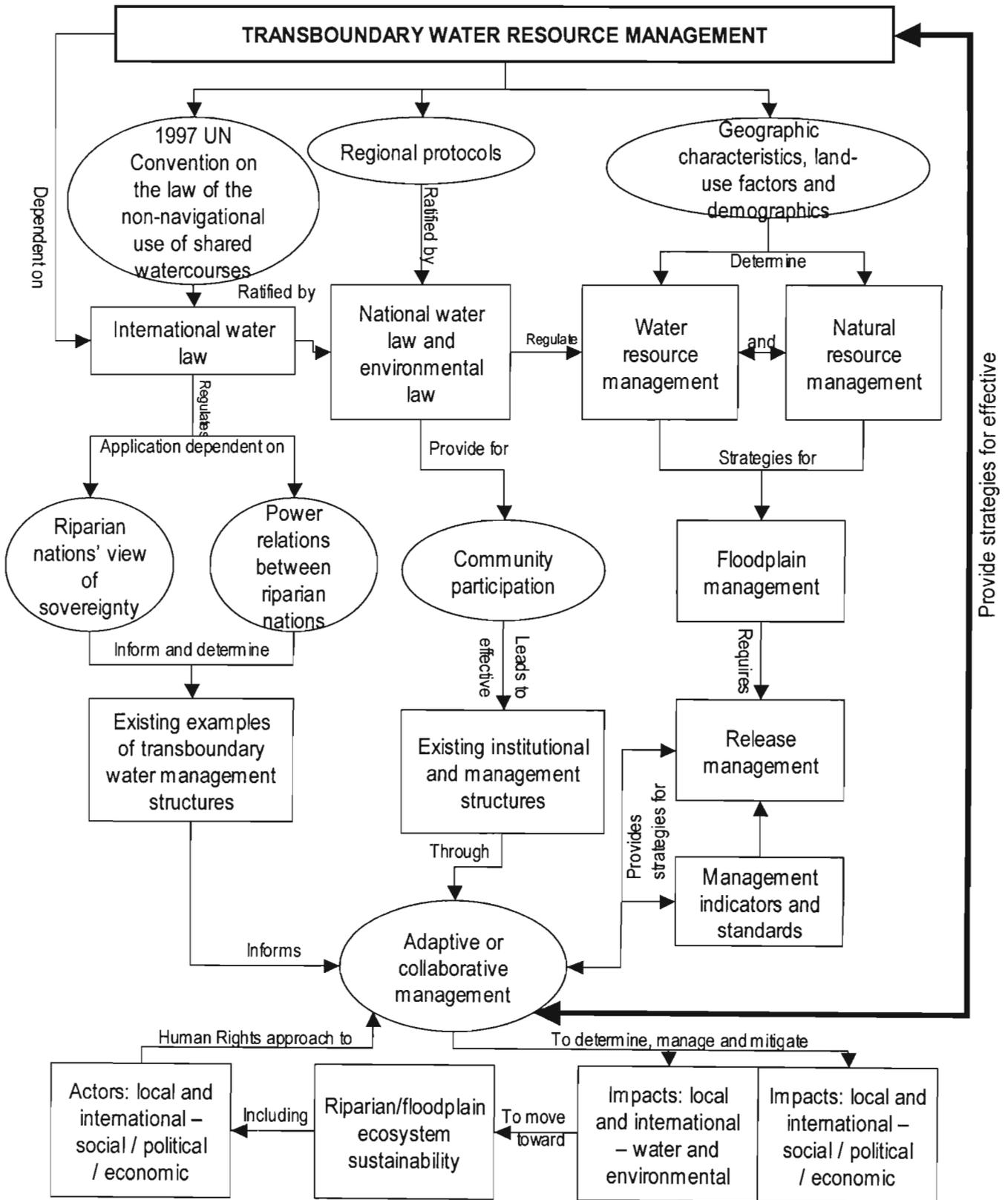


Figure 3.1: Conceptual framework for transboundary water resource management of the Pongolo River / Rio Maputo

iii) Interview analysis

Three major themes arise from the conceptual framework in terms of management of the study area:

- Transboundary management institutions
- Institutional and management structure of the area of study
- Water and natural resource management in the area of study

The interview and field data collected have been analysed (Appendix 3) according to these categories. From this analysis, gaps in current practice can be identified, especially with a view to informing the planned basin study to be carried out as a result of the Incomaputo agreement. The following questions will be applied to the collected interview and GIS data:

- What is the current status of this element of this theme?
- What constraints exist in the establishment of an ideal situation of this element of the conceptual framework?
- What can be established given the resources (human, natural or financial) available?

GIS data are presented to illustrate geographic, demographic and land-use characteristics of Moçambique since the interview scheduled with Mr Francisco Alvaro (Tripartite Permanent Technical Committee (TPTC) Liaison Moçambique), was unable to be completed because of time constraints. This constitutes a gap in this research in that it was impossible to get a first-hand perspective from Moçambique regarding their part in the negotiations of the Incomaputo agreement. The question list for the interview (Appendix 5) was sent electronically, but no answers were received. Interviews were conducted according to the list in Appendix 1, with members of relevant government departments, community members (South Africa), and other stakeholders.

iv) Community participation and basin-wide integration assessment

A long-term project in West Africa, the Sahelian Wetlands Expert Group (SAWEG), which worked in an area similar to the area of study, produced guidelines for integrated basin-wide management and community participation in floodplain management (IUCN/AfDB 1999). The physical and demographic similarities of the two sites and the fact that the states involved experience similar difficulties in terms of financial

resources suggest that the results of the analysis carried out on interview and field data and information could be assessed using these guidelines.

These guidelines were formulated after four years of study in the Sahel by 100 multi-disciplinary experts in various fields including hydrologists, psychologists, environmental and agricultural scientists, geologists and many others (IUCN / AfDB 1999). Cooperation was received for this study from the Senegal River Development organisation (OMVS), the Niger Basin Authority (ABN) and the Lake Chad Basin Commission (LCBC), as well as the governments and local government institutions in the areas of study.

The assessment has been performed on the following basis:

- This assessment is structured in terms of statements (Appendices 4 and 5), which can be evaluated as to the degree to which they have been achieved or could be achieved given the structures in place
- Each statement has been assessed according to the degree to which it holds true for the study area (Appendices 4 and 5)
- The degrees were listed as: Completely, Extensively, Partly or Negligibly. The term "Completely" has not been used in its literal sense (i.e. 100%), but where the degree is so high that very little further action in that area is required.
- Each degree has been given a score: 4,3,2,1 respectively (Appendices 4 and 5)

There are a number of categories in each assessment (Basin-wide integration and Community Participation), under which there are a varying number of statements. Each statement has been given a maximum possible score of 4, and then assessed in the manner described above. The total score in each category has been compared graphically with the maximum score in each category and then expressed as a percentage of the maximum score in each category.

The Strategy for Sustainable Resource use (Figure 9.3) synthesises the issues and constraints which have emerged from these analyses, in order to inform strategic resource use in establishing effective management in the area.

4. INTERNATIONAL WATER LAW

To determine the current application of transboundary water management in the area of study, it is first important to examine the principles of international water law and the development of international water management agreements.

The UN General Assembly adopted the UN Convention on the Law of the Non-navigable uses of International Watercourses (UN Convention) in 1997. It represents the “codification” of the rules of customary international law as regards shared watercourses (McCaffrey undated), and is the principal legislative instrument in international water law. It established three critical principles in the use of shared watercourses. They are:

- The principle of equitable and reasonable utilisation according to a number of factors including social and environmental factors. The principle states that these must be considered on a case-by-case basis (Article 6)
- The principle of obligation not to cause significant harm (Article 7), which protects downstream users of the watercourse from upstream development or utilisation. This principle introduces the possibility of compensation in the event that serious harm is caused
- The principle of prior notification in the event of planned measures that may “have a significant adverse effect upon other watercourse states” (Article 12)

Criticism of the UN Convention has been extensive, however, since the principles of equitable utilisation and significant harm seem to be discordant, since equitable and reasonable utilisation interpreted by one riparian nation may cause significant harm in another (Elmusa 2000).

The regional agreement in southern Africa, The Protocol on Shared Watercourse Systems in the Southern African Development Community Region (The Protocol), is based on those principles. Therefore, the Protocol perpetuates the *status quo* in that power relations between states and the application of sovereignty still define the use of international watercourses. This is as a result of the fact that

“the legal and policy framework as it currently stands in the UN Convention, however, is not precise enough, nor sufficiently streamlined and overarching for dealing in a comprehensive and effective manner with co-management issues”.

(de Chazoumes 2000:1)

An analysis of international transboundary river basin agreements reveals the lack of application of these criteria in existing agreements.

5. TRANSBOUNDARY BASIN MANAGEMENT ANALYSIS

Despite the some 300 treaties dealing with water allocation, management, use, flood management or hydropower, few have resulted in successful sustainable water management of international river basins.

Milich and Varady (1998), consider four paradigms or approaches, which have influenced the structure of the majority of such agreements across the globe.

- **The Technical / Scientific paradigm** – where an organisation is established to manage the basin (or a part of the basin), but engineers or hydrologists are selected to make an implement decisions, including those regarding the extent of public participation.
- **The Regulatory or Standard-driven paradigm** – based on environmental standards and pollution regulation. National standards, which may not apply in localised situations.
- **The Closed paradigm** – negotiated at the level of state-to-state, generally by high-level diplomats, to whom openness regarding a nation's resources is unacceptable.
- **The Top-down paradigm** – where states act according to signed international agreements and local actors are expected to implement them, with little power to make or change decisions.

Milich and Varady (1998) define five themes which emerge from these paradigms:

- Decision-making power remains centralised
- Decisions reflect power imbalances between states
- Implementation of the agreement is at the discretion of each state or signatory
- There is little opportunity and few mechanisms for meaningful public participation

Agreements are “driven by development needs” (Milich & Varady 1998:Part 2: 3), ignoring social costs.

In order to determine the nature of current transboundary agreements, and the level of sustainability and effective management of water resources, a selection of six agreements (Table 4.1) were analysed according to the following themes:

- Relative power (economic and political) of parties involved
- General approach
- Representation of communities/ local users (left to state or in agreement)
- Extent of public participation in formulation of agreement
- Public participation in agreement implementation
- Provision for environmental needs
- Management focus: Allocation, management, and development
- Management style: Top-down, technical, standard-driven, collaborative
- Monitoring: quantity, quality, supply, and allocation
- Regulation and enforcement of provisions of agreement
- Current projects in the basin with transboundary water management effects
- Member perceptions of allocation equity
- Conflicts and disputes
- Extent of marginalised users
- Effect on state and local user relations
- Comment

The analysis (Table 4.2) of the following basin agreements and organisations was synthesised from sources which include the text of the agreements themselves, news articles reporting on current conflicts in the basin, papers on pollution, for example Lindane in the Rhine basin (Knoop; van Puijenbroek & Wortelboer 1996), conference session discussions, project proposals and reports and transboundary natural resource management reviews.

The rationale for the selection of the various agreements for analysis is provided in Table 4.1.

Table 4.1: Institutional agreements selected for analysis

Management Organisation	River Basin	Rationale behind the selection of this organisation.
International Boundary and Water Commission (IBWC)	Rio Grande / Rio Bravo	This is an agreement between an economically and politically powerful state (US) and a state that is economically poor and politically, fairly unstable until recently (Mexico). The provisions of this Treaty have not been altered since it was signed in 1944.
International Commission for the Protection of the Rhine (ICPR)	Rhine	This agreement gave rise to a management organisation which includes seven economically powerful states, is well resourced financially and has access to a high level of technical expertise.
Israel-Jordan Joint Water Commission (IJJWC)	Jordan	This organisation was selected because it was formed to manage a heavily stressed river basin in an arid area. The states involved in this agreement have historically been embroiled in both political and ideological conflict.
Okavango River Basin Commission (OKACOM)	Okavango	This organisation is the first of the three African organisations selected for analysis. It represents one of the few organisations that have actively engaged in public participation.
Zambezi River Authority (ZRA)	Zambezi	The selection of this organisation rather than The Zambezi River Action Plan (ZACPLAN), was to demonstrate the effect of an organisation which takes a highly sectoral view, in that it was formed for only one aspect of water sharing, namely hydropower.
Tripartite Permanent Technical Committee (TPTC) (Pre-Incomaputo agreement)	Incomati	This organisation was selected as it was formed to manage a basin just north of, but significantly more stressed than the Maputo basin. Since the Incomaputo agreement was signed, the Maputo basin now falls under the aegis of the TPTC, and as such, it was important to analyse the TPTC's operations on the Incomati basin.

Following the analysis, which is condensed from Tompkins (2002: 37), presented in Table 4.2, themes which emerge as having affected the sustainability of the watercourse, have been determined in order to assess changes which are necessary in the formulation of future transboundary agreements.

The full analysis is presented in Appendix 2.

Table 4.2: Condensed analysis of selected transboundary river basin agreements

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
International Agreement	International Boundary and Water Commission (IBWC)	International Commission for the Protection of the Rhine (ICPR)	Israel-Jordan Joint Water Commission (IJJWC)	Okavango River Basin Commission (OKACOM)	Zambezi River Authority (ZRA)	Tripartite Permanent Technical Committee (TPTC) (Pre-Incomaputo)
States involved in agreement	US and Mexico	Switzerland, France, Luxembourg, Germany, The Netherlands	Israel and Jordan	Angola, Botswana and Namibia	Zambia and Zimbabwe	South Africa, Swaziland and Moçambique
Date of agreement	1944	1950	1994	1994	1987	1993
Condensed analysis according to stated criteria (Note: this analysis is condensed from that presented in Appendix 2)	Power inequalities are not acknowledged or addressed; volumetric allocations from Treaty's inception still stand despite significant changes in the basin; management style is highly technical and standard-driven with little collaboration from users which has led to over-use and 'unofficial use'; local user representation is left to the state making implementation of the Treaty's provisions difficult; the Treaty is focussed on utilisation not management therefore	The Rhine is distinguished by being a navigable river with a level of industrial activity, and also by the fact that all basin states are now members of the EU, which addresses some of the power issues; provisions have been adjusted since inception, especially with the recent decision that NGOs be admitted to the Plenary sessions as observers; management style remains highly standard-driven especially with regard to pollution; community representation is left to the state and carried out by technical 'experts'; standards are rigorous, and therefore difficult to maintain	Israel's military power and the ongoing political conflict is a major constraint to sustainable water management and addressing power inequalities between basin states; local user representation is left to state - given political and ideological problems; security issues constrain information flow which makes monitoring of the provisions difficult; provisions for environmental needs are secondary to security issues; management focus is on allocation in a highly water-stressed area and style is top-down and comprising mainly volume	Some power inequality issues as a result of stability and NGO assistance for Botswana; collaborative approach in implementation, but not in the formulation of objectives; stakeholders are represented through regional committees, within national boundaries; provision for environmental needs is relatively high, but untested in Angola and to an extent in Namibia; a transboundary Diagnostic Analysis is currently being performed; management focuses on allocation, management and development with assistance from NGOs and using a collaborative approach;	ZRA is an organisation formulated to manage one aspect of an international basin (hydropower), between only two of eight basin states; conflict over Zimbabwe owning most infrastructure and providing most employees has escalated to political tension between the two riparians; approach is high-level (state) and management style top-down with a high emphasis on political issues; no management objectives and no integration of any issues other than hydropower have brought pressure from other basin states and created tension between the parties; recent political upheaval	South Africa's political and economic power, and high level of existing use (mainly agricultural) have resulted in tensions between Moçambique and South Africa; high level approach and top-down management style with a focus on allocation (minimum flow requirements), rather than integrated management; community representation is left to the state at all levels, though some business interests (sugar) are represented; no public participation in implementation or formulation of the agreement's provisions; provision for environmental needs is inadequate given the

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Condensed analysis according to stated criteria	environmental needs are not adequately addressed; consistent conflict between cross-border users has led to costly high-level government negotiations; other basins are not taken into account in determining Mexico's 'water debt' to the US.	across diverse uses and population densities; downstream states still experience very high levels of pollution despite 50 years of regulation by the ICPR.	allocations; other basin states (Palestine) are excluded; dispute dealt with by Water Commissioners in each state.	low population density and war in Angola means the organisation has not been tested; dispute committee is outside OKACOM process, new users may pressure OKACOM.	and lack of management objectives have resulted in sustained capacity problems.	technical focus and perpetuation of unsustainable existing use; Moçambique has threatened to take South Africa to the International Court of Justice over lack of flow.
Comment	Technical measures, especially those that were formulated over 50 years ago are inadequate to deal with the levels of complexity in current transboundary water management. Local user involvement is essential in determining fair allocation. A focus on utilisation cannot provide for environmental sustainability.	The ICPR has a long history of technical cooperation in a fairly stable political system, but this has not resulted in a sustainable river basin. Technical measures and good-neighbourliness are not sufficient criteria for successful transboundary management.	The technical cooperation between Israel and Jordan in the IJJWC, despite having been unsuccessful in terms of basin management, does represent the possibility that two states, usually in enmity, can cooperate.	Potential conflicts resulting from unplanned abstraction in Angola and development in Namibia will put pressure on OKACOM. The agreement highlights "the need to redress the respective rights of state and citizens" ⁴ .	The ZRA is an example of what not to do in transboundary water agreements ⁴ . It has consistently spawned conflict rather than provided a mechanism for either avoiding or resolving it. A highly sectoral view does not make for successful agreements.	South Africa continues to enjoy the benefits of the upstream Incomati, while Moçambique must pay the costs of lack of development. The perpetuation of existing use as a cost to potential uses must be addressed in transboundary agreements.

i) **What, therefore, must change in transboundary water agreements?**

Table 4.2 examines a range of transboundary agreements, formulated over the last 50 years around the world, in both developed and developing countries, on industrial rivers and rivers which primarily flow through rural or sparsely populated areas, through powerful or poor nations. None of these agreements have led to a sustainable management system. So what can be learned?

- **Provide for a review period of the terms of a transboundary agreement**

The ongoing conflict generated by the 1944 US-Mexico Treaty's volumetric allocations illustrates the need to renegotiate these allocations, to reflect the changes in the basin. Therefore, transboundary agreements should provide for regular review of the terms of the agreement, to ensure that the management system is flexible and can take into account changing characteristics of the basin.

- **Transboundary water agreements are ineffective if only state concerns are taken into account**

Effective implementation of an international agreement depends largely on local actors, with real decision-making power. An aspect of state-level agreements, which is especially important in Africa, is the consideration of traditional and tribal resource rights. These could be extinguished by a transboundary agreement at state level, and increase resource tenure insecurity that new democratic governments are attempting to redress at a national level (Mohammed-Katerere 2001).

- **Create new 'experts'**

The ongoing pollution of the Rhine and the consistent conflict and ecological deterioration of the Rio Grande shows that even a well-funded, well-established management organisation in countries with democratic political systems and generally good governance, staffed with a plethora of experts in engineering, hydrology and chemistry have been unable to find a solution. Africa's increasing population and development especially along life-giving river basins, quality standards and volumetric flow requirements cannot possibly be implemented and maintained centrally, by acknowledged experts alone. Wolf (2000) suggests that tapping the often-ignored resource of rural natural resource management expertise will address a number of problems:

- Lack of active local user involvement in transboundary agreements which often increases local users' insecurity around resource use, and leads to unplanned abstraction from rivers at a local scale
- The cost of centralised implementation and monitoring is difficult to reach areas by the use of local "information specialists" who are actively involved, improving local recognition of international agreements and building trust between users
- Lack of a genuine flow of information, not only between states, but also between the state and its own citizens and between citizens from the member states in the agreement.

- **Different management objectives for different area typologies**

At the Second World Water Forum in 2000, the Rhine basin states agreed that it was impossible to apply one set of solutions to all the basin states. Instead it was proposed that management organisations in one member state were 'twinned' with organisations in another, all under a River Authority. This goes some way toward, solving the problem, but perhaps management organisations for similar geophysical or social areas should be twinned, rather than maintaining national boundaries. In this sense, twinning can be described as applying the resources, technical, intellectual and financial, of different basin management organisations within a basin to a more deeply co-operative approach to problems. It may involve separate legal agreements between organisations, but will certainly include activities such as: developing management systems, participation in workshops and mutual training of staff (NetCoast 2001). This goes some way toward, solving the problem, but perhaps management organisations for similar geophysical or social areas should be twinned (or one organisation for that area formed), rather than maintaining national boundaries.

- **Manage the environment, not just the water**

Local land-use practice affects water resources as much as do upstream activities. The land and water environments cannot be separated, and transboundary agreements must reflect that interconnectedness. Assistance from environmental NGOs can provide input into the management organisation or authority, for environmental management practice and principles to augment water management.

- **Do not perpetuate existing use at the cost of potential uses**

This creates the potential for conflict between users and states and may perpetuate unsustainable existing use as illustrated by the Incomati basin. Existing use, protected by a powerful upstream state has resulted

in severe environmental impacts, which have threatened both state relations and the basin itself. Transboundary agreements must be flexible about what the best uses are, not the best uses given the existing uses, which does not support the UN Convention's "no use has inherent priority over existing use" clause (Mohammed-Katerere 2001).

- **Expect disputes and conflicts, and manage and prepare for them**

In large basins with many uses, and increasing populations, there is likely to be conflict and dispute over water. An agreement should, therefore, contain (agreed) dispute resolution and avoidance mechanisms which have been negotiated at all levels, not simply state to state. In this way, disputes are often resolved before they become conflicts. Should the situation escalate, an international arbitration body, as Wolf (2000) proposes, specifically for water disputes, would be a less desperate solution than threats of international litigation.

- **Encompass a broad spectrum of issues and sectors**

Agreements such as the ZRA, which address one issue, such as hydropower, generally incite conflict. The world's river basins don't serve just one need; therefore agreements formulated to regulate one need assume that that need has priority. As in the case of the Incomati, agreements "emphasize water development, rather than management,...tensions around use may be exacerbated" (Mohammed-Katerere 2001:4).

- **Address power and political issues at the outset**

Governments, policies and economies change. Transboundary agreements which address issues of power inequalities, acknowledge that inequalities exist, and are flexible to changes in those relations at the outset, are more likely to achieve what they ostensibly set out to do: manage water resources. Such agreements are also more likely to be able to separate water from other political issues, which enhances, rather than detracts from both state security and state sovereignty.

- **Agreements should be transparent, and actors accountable**

These are two words often quoted with regard to governments and corporations, but in transboundary agreements, they are essential practices. A river authority which is not transparent will engender suspicion

in local users and other state actors, and information flows so critical to water management, will be incomplete or worse, misleading. The qualities of accountability and taking responsibility for carrying out the terms of the agreement, especially in the case of pollution, are vital to the long-term survival of the agreement, the watercourse, the environment and the human population who depend on them.

ii) Conclusion

Current legal frameworks, international, regional and local, do not adequately address the complexities of international water management. International law does, however, provide for a human rights framework in water management. Given the failure of international legal instruments to manage sustainably the world's transboundary water resources, there is

“an emerging theory which has already been embraced by many jurists and international lawyers ... that of common ownership of international watercourses. The idea that water flowing between two states is communally owned is based on and assumes full co-operation over such water” (GCI 1999:14).

It also assumes the human right to water is taken into account in its management. This assumption is currently outside the legal framework governing the use of water resources, but finds support in the principles of customary law and in the UN Universal Declaration of Human Rights.

6. THE APPLICATION OF HUMAN RIGHTS THROUGH COLLABORATIVE MANAGEMENT

International law is considered by Glieck (1998), to be an “inappropriate mechanism” to regulate international waters. The human rights approach, however, regulates not only the behaviour of sovereign states toward each other, but also the actions states carry out internally, over their own citizens. Because “well-being” is essentially derived from the environment in which any human being exists, it also informs the practice of both water and environmental management within and between states (Mohammed-Katerere 2001), and highlights the interconnectedness of water and environmental management in upholding the Universal Declaration of Human Rights.

The human right to water, though implicitly referred to, is inadequately reflected in most international, regional and national legal instruments (though the South African National Water Act 36 of 1998 is markedly

progressive in this area), despite the argument that “rights to water can also be considered a derivative of the right to life” (Mohammed-Katerere (2001:44). Glieck (1999) suggests that

“at a minimum...the explicit right to life, and the broader rights to health and well-being described [in the Human Rights Declarations and Covenants], must include the right to sufficient water, at appropriate quality, to sustain life”.

The exclusion of the right to water would render the explicitly stated rights in those conventions and declarations meaningless (Glieck 1999). To address this, the principles of collaborative management must be applied to transboundary river basin management systems and organisations, to support more effective local public participation, and establish a link between human rights and water allocation (Mohammed-Katerere 2001).

“A genuinely integrated approach to river basin management calls for the explicit inclusion of the often ignored socio-cultural aspects of water management, using a participative approach which promotes social learning”.

(van der Lee 2002:11)

Savenije and van der Zaag (2000) identify three critical factors for transboundary river basin management:

- Integrated supply and demand management
- Public participation
- Enhanced regional economic integration

Integration implies management objectives which take into consideration all factors and apply them effectively to water use, a move away from the prevailing sectoral approach to water management (Katerere, Hill & Moyo 2001). Therefore, to “integrate” management of water resources as described in the above criteria, an overall management strategy, which is both transparent and accountable to local users, is essential in order to take into account the requirements of the numerous users of the watercourse, including the environment, and to promote sustainability and equity in water-sharing agreements.

An integrated approach to water management cannot be achieved without embracing the principles of collaborative management, as set out by Margerum (2001):

- A holistic (system-wide) approach
- An appreciation of the interconnectedness of these systems, in transboundary problems, biophysical and socio-economic relationships

- Agreed goals or management objectives
- A strategic approach to decision-making focussed on key actions

This is especially applicable in the African context, where a lack of resources and infrastructure severely constrain centralised management and the implementation of new policies and principles in rural areas. It is important, therefore, to identify the stakeholders who must be involved in moving toward integration in water management.

7. STAKEHOLDER ANALYSIS OF THE PONGOLO FLOODPLAIN

The stakeholders listed in Table 7.1 have been arranged according to their stated timing requirements for flood releases from the Pongolopoort Dam. No formal stakeholder identification process has been performed, but these are the stakeholders identified by the Department of Water Affairs and Forestry (DWAF) and the Lubombo Water Ways Programme (LWWP).

Moçambique is identified as a single stakeholder, as information regarding stakeholder groups on the ground is very difficult to obtain. All negotiations with Moçambique are conducted through DWAF (National), with the Moçambican National Directorate of Water. Therefore, communities on the ground in this area of Moçambique are not represented in this analysis.

Members of the community on the South African side are represented by various community structures, such as the Water Committees, POWADETA, or Mjindi Cotton. This assumes that these structures are representative of all community interests. Further research is required to ascertain whether or not this is the case.

This analysis provides stakeholder areas or groupings from which key members of a representative management organisation would need to be drawn (Table 7.1).

Table 7.1: Stakeholder analysis according to flood release timing requirement

Stakeholders (grouped according to FTR)	Flood Timing Requirement (FTR)	Reason for FTR	Activities	Level of Influence in Management of Floodplain	Comments
Makhatini Agricultural Research Station (MRS)	SUMMER	Support environmental reasons for summer flood, and though representatives from the MRS do attend meetings, attendance is irregular	Agricultural research – potential crops, optimum yield combinations	Low, attend meetings mainly as an observer	Little integration, results of agricultural research not linked to water & water supply. The MRS does communicate the results of their research to farmers in the area, but there is no monitoring as to how those results are applied in practice
Water Committees Note: Some Water Committees advocate a winter release, but mainly those associated with agricultural organisations e.g. POWADETA		Seven remaining – little meaningful participation, though DWAF is sponsoring a programme through LWWP to regenerate Water Committees	Made up of: farmer, fisherman, women (domestic interest), stock owner, traditional healer – to represent local communities	Little meaningful participation, especially since 1996, after emergence of POWADETA (GM Cotton production) and departure of Charel Bruwer from DWAF	Community interests are inadequately represented, public enthusiasm for and understanding of water management is dwindling with lack of representation
Lubombo Water Ways Programme		Community representation, Mboza Village project (became LWWP), initial Water Committees, tourism development. Support environmental requirements	To “establish a structure to assist DWAF and various stakeholders to participate in planning and implementing a more equitable flood release and resource use programme” (Poultney 2000)	Significant presence at release meetings, but little effect on management objectives, despite consistent efforts to engage the controlling authorities	Have recently received a short-term contract from DWAF (National) to resurrect Water Committees and identify new stakeholders with a view to establishing a stakeholder co-management organisation
Game and Fishing Lodges (above the Dam)		Prefer 3% incremental release but cannot be accommodated, so support environmental requirements	Game & fishing farms, fishing competitions, tourism. Private conservation	Attend meetings, support proponents of summer release, but little effect	Represent an opportunity for more integration of tourism activities in the area, and data collection for management objectives
KZN Wildlife		Support wetland conservation and Ramsar Convention provisions	Nature conservation, tourism	Attend meetings, support summer release, but little effect	Little input to general environmental education of communities, but could assist in monitoring of management objectives and training of “new experts”

Stakeholders (grouped according to FTR)	Flood Timing Requirement (FTR)	Reason for FTR	Activities	Level of Influence in Management of Floodplain	Comments
KZN Department of Health	WINTER	Summer release means higher incidence of breeding sites for malaria vectors	Malaria control, internal DDT spraying, malaria education in community and control sites in Moçambique	Through President Mbeki's public support for the DDT spraying campaign instituted in 1999, a powerful political argument for winter release regime gained support locally. The DOH do not attend release meetings regularly, but do observe occasionally	Opportunity for communication with Moçambique exists in the co-operation evident for control of malaria. The DOH has environmental education programmes for its DDT sprayers, could be extended to include more general environmental education
Mjindi Farming		Generally – use water from the Dam, but farmers on the edge of the floodplain advocate winter flooding so that cotton harvests are not inundated	Cotton farmers, some sugar, and also 10ha lots – banana and other subsistence crops. The recent launch of the Agricultural Development Plan by the KZN DAEA indicates the need for more integration with Mjindi in a management organisation	Not represented at release meetings, though generally supported by the DAEA	Primarily concerned with farming off the floodplain, use water from the Dam, but affect general ecology of the area. Subject of the DAEA's development plan
POWADETA		Claim to represent 4000 cotton and subsistence farmers and claim to have the blessing of the <i>amakhosi</i> . No release until after cotton harvest.	GM cotton farming (Monsanto support for Bollgard), subsistence farming and claim to represent wide range of local actors, but interviews with its chairman has shown that representation to be related to cotton farmers almost exclusively	DWAF claims that they are the primary driver for winter releases, and that their power is such that their demands have been met since 1996. There have been claims of intimidation of other stakeholders in the past, but that is not the case at the moment	The profitability of cotton results in increased support for POWADETA. They have now merged with the Ubongwa Board, which is an association entirely related to cotton farming. POWADETA as a "water" organisation is no longer what is purported to be in 1996 since merging with Ubongwa
Moçambique	NO RELEASE GREATER THAN 85m ³ s ⁻¹	Reportedly (DWAF (SA) & LWWP) levees along the banks of the Rio Maputo will be damaged leading to inundation of agricultural lands but have recently agreed	Little information regarding communities on the ground in Moçambique is available, but it is possible that the Regional Malaria Control Council and the DOH can assist in this regard.	Seem to be determining flood release timing through Joint Liaison Committee with DWAF National, but not represented at release meetings	No release between October 2000 and July 2002 – people on floodplain walking 8kms for fresh water, stated ecological consequences. The Incomaputo agreement may change this situation, but the impacts of this agreement are unlikely to be felt in this basin for some time (van Wyk <i>pers. comm.</i> 2002)

Stakeholders (grouped according to FTR)	Flood Timing Requirement (FTR)	Reason for FTR	Activities	Level of Influence in Management of Floodplain	Comments
Department of Water Affairs and Forestry (DWAF)	NO SPECIFIC TIMING REQUIREMENT	Get the Dam to 80% capacity (sufficient buffer for the rainy season)	Controlling authority, maintain the Reserve.	The only manager at the moment – little integration with other Departments	Lack of effective release regime with stated ecological and social consequences
Department of Agriculture and Environmental Affairs (DAEA)		Support local and commercial farmers	Agricultural extension, land-use planning	High for land-use management (mandate from Land Affairs to dispose of State land, development plan for Makhatini Flats)	Injudicious land-use practise leading to stated ecological consequences
Local Government		Recently emerged from demarcation process. Tribal authorities represented through Water Committees and POWADETA	Municipal planning, implementation of IDP	No integration at the moment	Little effective community representation, no evident development strategy, despite the IDP process. The area has only recently been divided into two new Municipalities, Jozini and Umhlabuyalingana
Shemula Water Supply Scheme		Abstraction of 40000kl/month. (40% loss through high-pressure pumping of water) (Survival of scheme is in doubt)	Supply water to local inhabitants, through water supply points	Not represented at release meetings – as long as there is 40000kl/month in the river. As a result of Municipal Demarcation this scheme is to be taken over by Jozini municipality	Significant wastage from leaking infrastructure – impossible to implement free 6kl/month policy
Lubombo Spatial Development Initiative		Concerned with private investment in tourism and infrastructure	Unable to contact them for meaningful information, after repeated attempts	Not represented at release meetings	The SDI's primary area of concern is now GSLWP, and other specific sites in Moçambique and Swaziland
Residents in Mbangweni Corridor		Concerned with land tenure claims, no direct access to river except through Ndumu	Subsistence farming, informal cross-border trade	Not represented at release meetings, though recently, with the re-emergence of the Water Committees through the LWWP, the water committee for this area is likely to be represented	The Ndumu game fence removed access to the river. There is an access agreement with KZN wildlife, but there are problems with people fetching water from the river being attacked by game
Mkuze Estates		3000m ³ inter-basin transfer to Mkuze from Dam	Sugar farmer – private infrastructure	Not represented at release meetings	Ecological consequence of IBT, abstraction may affect release amount

As Table 7.1 illustrates, the range of opinions, needs and requirements of stakeholders on the Pongolo floodplain are wide, varied and deeply complex. The floodplain supports local livelihoods from harvesting of materials for craft manufacture, to subsistence farming, to fishing and provides irrigation for larger scale farming. Despite such variance, however, the Water Committees, established in 1988, and through the release meetings, have provided a forum for communication between both local and government stakeholders. While this was effective over the period 1988 to 1996, its effectiveness begun to decline with the departure of Charel Bruwer from DWAF. Mr Bruwer had an amicable and long-standing relationship with the local communities, but it was not a formal one and as such, could not be continued after his departure. This suggests that had formal communication mechanisms been in place at Mr Bruwer's departure, it is possible that the DWAF / community relationship may not have broken down. The lack of updated operating rules for the Pongolopoort Dam, and the fact that stakeholder are unfamiliar with large dam operating principles are also factors which have contributed to a breakdown in relationships.

A major issue between local stakeholders is the apparently contradictory interests of agriculture and ecology. While the obvious importance of agriculture is acknowledged, many farmers plant in ecologically sensitive areas, and because their losses are financially quantifiable, as opposed to the longer-term and less easily measured ecological costs, their interests are generally considered above those of the environment. This situation is not justifiable under current South Africa water law, and objectives to amend it must be found.

Though the relationship with Moçambique is often stated as a major cause of friction between stakeholders and DWAF, this situation should be remedied by the recent signing of the Incomaputo agreement, which includes the Pongolo River, and has at least formalised allocations and opened information-sharing channels between South Africa and Moçambique.

There are currently two projects in operation on the Pongolo floodplain, one short-term and one long-term (three years) designed to bring the various stakeholders together, one of which is being administered by the Lubombo WaterWays Programme and a second by the University of Natal, Pietermaritzburg and the Water Research Commission (WRC).

8. ASSESSMENT OF BASIN-WIDE INTEGRATION AND COMMUNITY PARTICIPATION IN THE AREA OF STUDY (APPENDICES 4 & 5)

This integration and community participation assessment is adapted from the SAWEG Guidelines for Basin-wide Integration and Community Participation (IUCN / AfDB 1999) after the establishment of a management organisation on the Waza-Logone floodplain below the Maga Dam in the Sahel, West Africa. Because of its similarities, both physical and demographic to the area of study, it has been adapted to assess community participation prior to the establishment of a formal management organisation, in order to determine areas which require attention to improve community participation in floodplain and subsequently basin management. The meaning of participation in this sense is active and effective participation, which allows for stakeholders to influence management decisions, not simply consultation, whereby stakeholders are informed of management decisions, but have no power to influence them.

This analysis is a qualitative analysis, and has been prepared as a visual guide to areas where resources should be concentrated in adapting a basin management agreement to new directions in integrated management thinking. It is based on assessment by the researcher, of the qualitative data obtained from interviews (Appendix 1) with stakeholders and gleaned from stakeholders' speeches at the University of Natal, Pietermaritzburg (UNP) / Water Research Commission (WRC) workshop between 15th and 18th October 2002.

i) **Integrated basin management assessment**

Some of the assessment statements from the original IUCN/AfDB (1999) assessment have been removed as being relevant to the particular area of study (the Waza-Logone floodplain in the Sahel) and the process undergone to produce the guidelines.

The assessment was performed according to a number of categories (Figure 8.1) each of which contains a varied number of statements. Each statement has been given a maximum possible score of 4, and then assessed in the manner described in the methodology (Paragraph 2). The total score in each category has been compared with its maximum score and expressed as a percentage of the maximum.

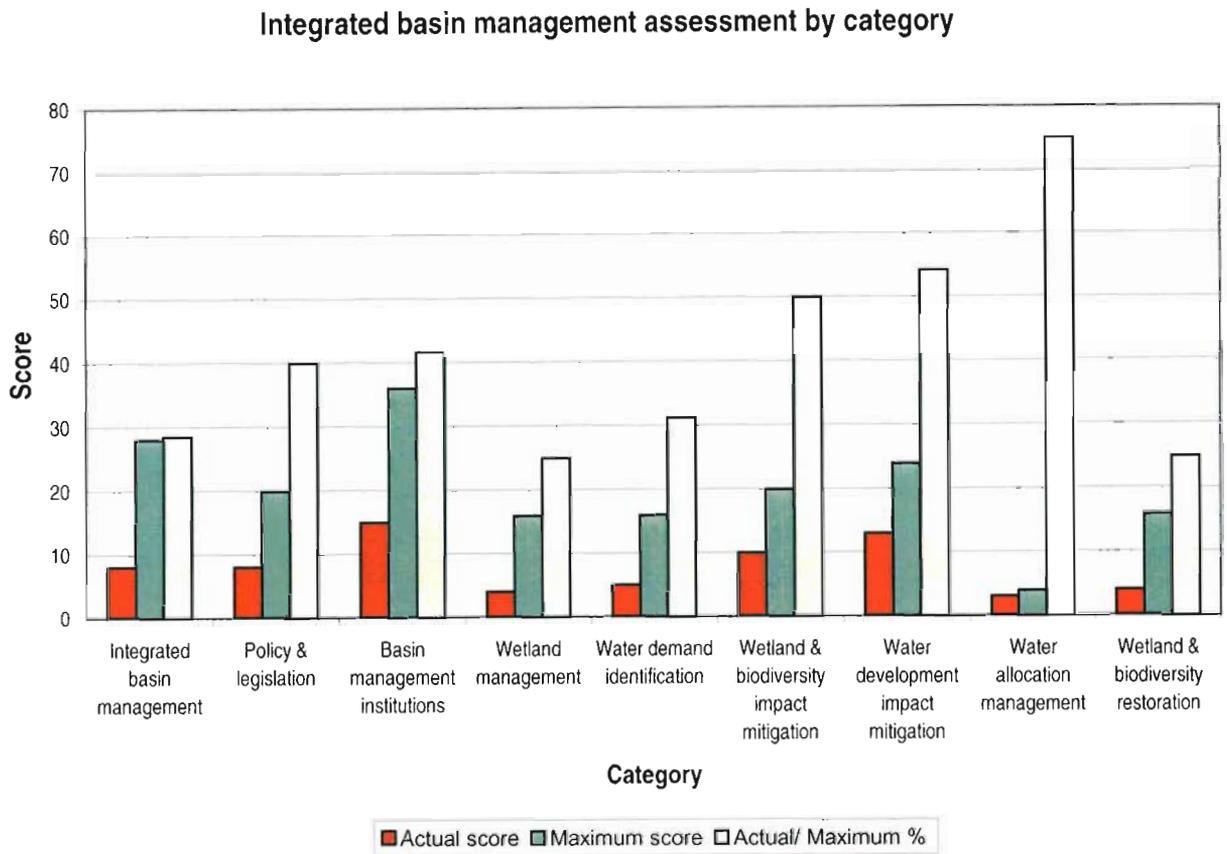


Figure 8.1: Basin-wide integration assessment (actual, maximum and % actual / maximum scores)

Analysis of the Incomaputo agreement (which was signed on 29th August 2002) shows that there is a significant lack of reference to the management of wetlands, which form a large part of the area of study; including the Pongolo floodplain in South Africa, and the Futi Wetlands in Moçambique (though this assessment has been performed using Pongolo floodplain data only). This factor, and the lack of adequate demand identification, completion of which is not scheduled until February 2009 (Incomaputo agreement Annex V), seriously impacts on integrated management, which is essential in moving toward sustainability. Furthermore, concentration on technical factors, allocation and development before establishing supply and demand in the basin has been shown by the analysis of international management organisations, to be ineffective. Although the agreement recognises ecological flow requirements, it fails to integrate wider environmental issues, in that it is managed entirely by Water Affairs authorities in each riparian nation. Policy and legislation also requires adjustment to incorporate these issues more effectively into the legal framework upon which the agreement is based. Another

important aspect of water management, which is not addressed by the agreement, are social issues which can only be adequately addressed through active local user participation in management of river basins. It is therefore important also, to assess the level of participation in the area of study.

ii) **Community participation assessment**

Some of the assessment statements (Appendix 5) were removed, as they are relevant if a management organisation has been established, which is not the case as yet on the Pongolo floodplain.

The total score in each category has been compared with its maximum score and expressed as a percentage of the maximum (Figure 8.2).

Community participation assessment for the Pongolo floodplain

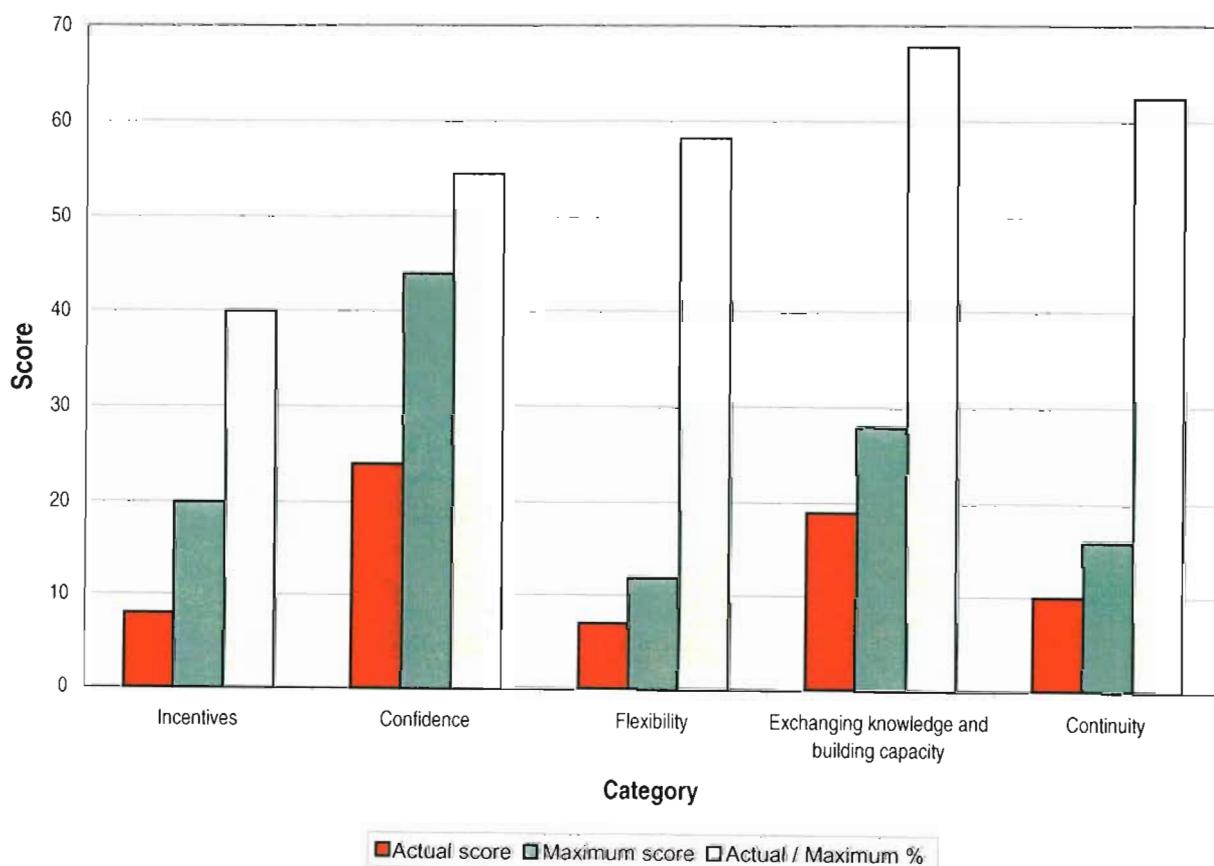


Figure 8.2: Community participation assessment (actual, maximum and % actual / maximum scores)

These analyses show that the areas which require the highest consideration are incentives and stakeholder confidence. The purpose of this analysis is to determine the areas which require attention and to provide a strategic guide for the use of resources before the management organisation is established, as programmes currently in operation on the floodplain have set out to do (Appendix 5).

This community participation assessment has been performed in order to determine critical elements in the establishment of a management organisation for the Pongolo floodplain. This requires an understanding of the level of participation that currently exists in the area. It also requires knowledge of the key stakeholder groupings from which members of that organisation would need to be drawn, so as to represent adequately the interests of all community, commercial and government stakeholders.

9. DISCUSSION

i) Key stakeholders in a floodplain management organisation on the Pongolo floodplain

a) Government departments

The analysis has shown that the principal government department involved in management of the floodplain is currently the Department of Water Affairs and Forestry. Although the dam and release management is an important component, one of the barriers to effective and sustainable management of the floodplain, has been the lack of integration of other government stakeholders. In Moçambique, the Direcção Nacional de Aguas (DNA) is responsible for water management, and the state is the owner of the nations water resources (unlike South Africa in which the state is the custodian of water resources). A lack of infrastructure and the ravages of the civil war in Moçambique have made implementation of the provisions of the DNA's Integrated Management Council difficult, though it does include local government and community representation (Leestemaker 2000).

b) Conservation organisations

The Ndumu Game Reserve, managed by KZN Wildlife, is an important stakeholder in water management, not least because it is a designated Ramsar site, and given that South Africa is a signatory to the Ramsar Convention, is subject to its provisions for wetland conservation. Furthermore, the wildlife management and conservation expertise and experience within KZN Wildlife could provide

an important advisory role in the setting of management objectives for a floodplain management organisation.

c) *Floodplain communities*

The Water Committees are a proven structure for community participation on the Pongolo floodplain. Because of their composition: farmers, fishermen, stockmen, traditional healers and women, they ensure a wide range of representation of the rural community on the floodplain. From those committees, a higher committee could be elected to form a part of the management organisation, preferably in the same composition as the Water Committees. In this way, extensive community representation can be achieved and the management organisation can draw on the experience of committee members who have long engaged in a form of community management on the floodplain.

d) *Commercial stakeholders*

A current lack of coordination between two critical elements of development, agriculture and water management, demonstrates the need for the inclusion of the interests of commercial agriculture into a floodplain management organisation. Furthermore, agricultural development, outside the Makhatini Irrigation Scheme and Mjindi Cotton, is largely unplanned, and though many farmers are represented through farmers' organisations such as the Makhatini Farmers Board and the Ubongwa Cotton Farmers Board, there are inadequate links with water management structures on the floodplain. In the past, this has resulted in releases taking place out of season (after cotton has been harvested).

There are a few private tourism ventures (small lodges and hotels) in the area around the floodplain, but the natural beauty of the area allows great potential for the development of such ventures. It is important therefore, that the interests of tourism operators are also represented in water management, and therefore in a floodplain management organisation.

e) *Moçambique*

In Moçambique, the area forms the sparsely populated Futi wetland system, similar in geographic and land-use characteristics, and in climate, to the South African side. Consequently, management principles generated as a result of research on the South African side can be applied to a similar area in

Moçambique, though adjustments may be required for the prevailing economic and socio-political conditions there.

Information regarding community structures in this area of Moçambique, especially as regards water management, has been difficult to obtain given time constraints. Moçambique is therefore described as a single stakeholder. There is no evidence of community structures specifically relating to water management such as those on the Pongolo floodplain, but efficient community and local government structures do exist, as evidenced by the Regional Malaria Control Council. There is a possibility that these can be extended to include water management issues (Sharp *pers. comm.* 2002)

The area of Moçambique through which the Maputo flows is a sparsely populated, largely rural area, with small towns and villages concentrated around the river (Figure 8.3). Population census figures from 2002 show that there are less than 37000 people living in the three provinces through which the Maputo River flows. The highest population density is north of Salamanga in Missevene province, where the railway line to Maputo begins. There are few roads in this area, all of them secondary, and very little infrastructure.

Land use activity is limited primarily to subsistence farming, although there is some irrigated land around the town of Salamanga, along the banks of the river, and Catuane, close to the South African border. There is a predominance of marsh and wetland throughout this area, through to the mangroves in the Maputo Elephant Reserve at the mouth of the river and of which the river forms the western border.

Currently, there is no synergy between water, environmental and commercial issues, and the approach remains sectoral in an area where the interconnectedness of water and the environment support the livelihoods of many rural poor. In the light of the ecological significance of the area, and its capacity to support the local livelihoods as well as provide potential to the eco-tourism industry, it is important to integrate efforts to apply resources to a strategic management system. This area represents an opportunity to apply new thinking in an area that is currently unstressed in terms of populations and water use.

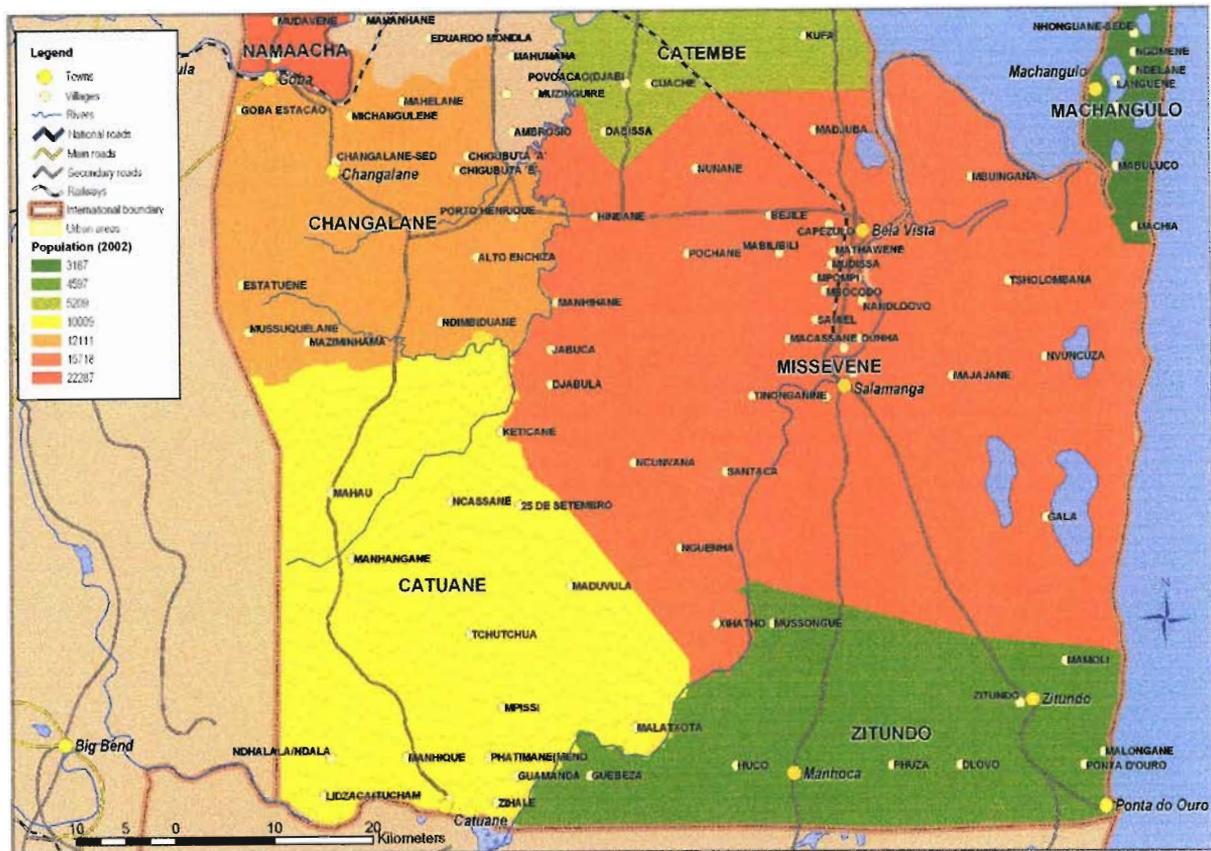


Figure 9.1: Population and infrastructure in southern Moçambique

Source: Direcao Nacional de Geografia E Cadastro, Ministry of Health (Maputo), Medical Research Council

ii) Transboundary basin management

International importance is ascribed to the wetlands on the Pongolo floodplain and in the Futi corridor, for their ecological significance and support of biodiversity, and their capacity to support diverse local livelihoods. The Incomaputo agreement does not explicitly acknowledge wetland management principles. The basin-wide integration analysis illustrates that the agreement is heavily skewed toward water allocation and development, based on technical principles agreed at state level. Although, “up to now the technical side has dominated, because of historical approaches and because it can be well defined and we are more skilled at it” (van Wyk *pers. comm.* 2002), it does not promote sustainable and equitable use of water resources.

Furthermore, the agreement was negotiated entirely by officials representing Water Affairs departments in South Africa, Moçambique and Swaziland. There is a prevailing view that “scientific monitoring cannot

be done by communities" (van Wyk *pers. comm.* 2002). Therefore, the significance of land-use practice and environmental management practice with regard to the Pongolo floodplain and the Futi wetlands has not been addressed. Afforestation, which falls (at least in South Africa; in the Maputo basin most large-scale forestry takes place in South Africa) under the aegis of DWAF, has been addressed in the agreement.

The exclusion of these factors represents a major constraint to integrated management of the basin, and also indicates the highly sectoral approach that has been taken in this agreement. Most importantly, however, is the need for decision-making power to be devolved to a floodplain management organisation (Figure 9.2), should one be established, following the setting of management objectives by the combined stakeholders.

The Incomaputo agreement perpetuates, to a large extent, the shortcomings of the international water management organisations analysed in section 4. It is negotiated at the level of state; takes a sectoral approach; manages only the water, not the environment; maintains management within national borders; is heavily skewed toward technical information and; perhaps most importantly, is lacking in transparency, negotiations are unpublicised, and the TPTC organisation's documentation is not freely available. The lack of transparency has the result that "the process starts out adversarial" (Dent *pers. comm.* 2002), and dispute resolution is cumbersome and expensive, though there is an acknowledgement that "links [between competing users] will have to be built up" (van Wyk *pers. comm.* 2002).

The Incomaputo agreement is, however, the first step toward consensus between "competing" nations, and is an interim agreement, which can be adapted to new directions in integrated water management thinking. The major constraint to that integration seems to be an unwillingness to "lose control" of what has been, and will continue to be an increasingly important strategic resource in a water-stressed world in a semi-arid country: water.

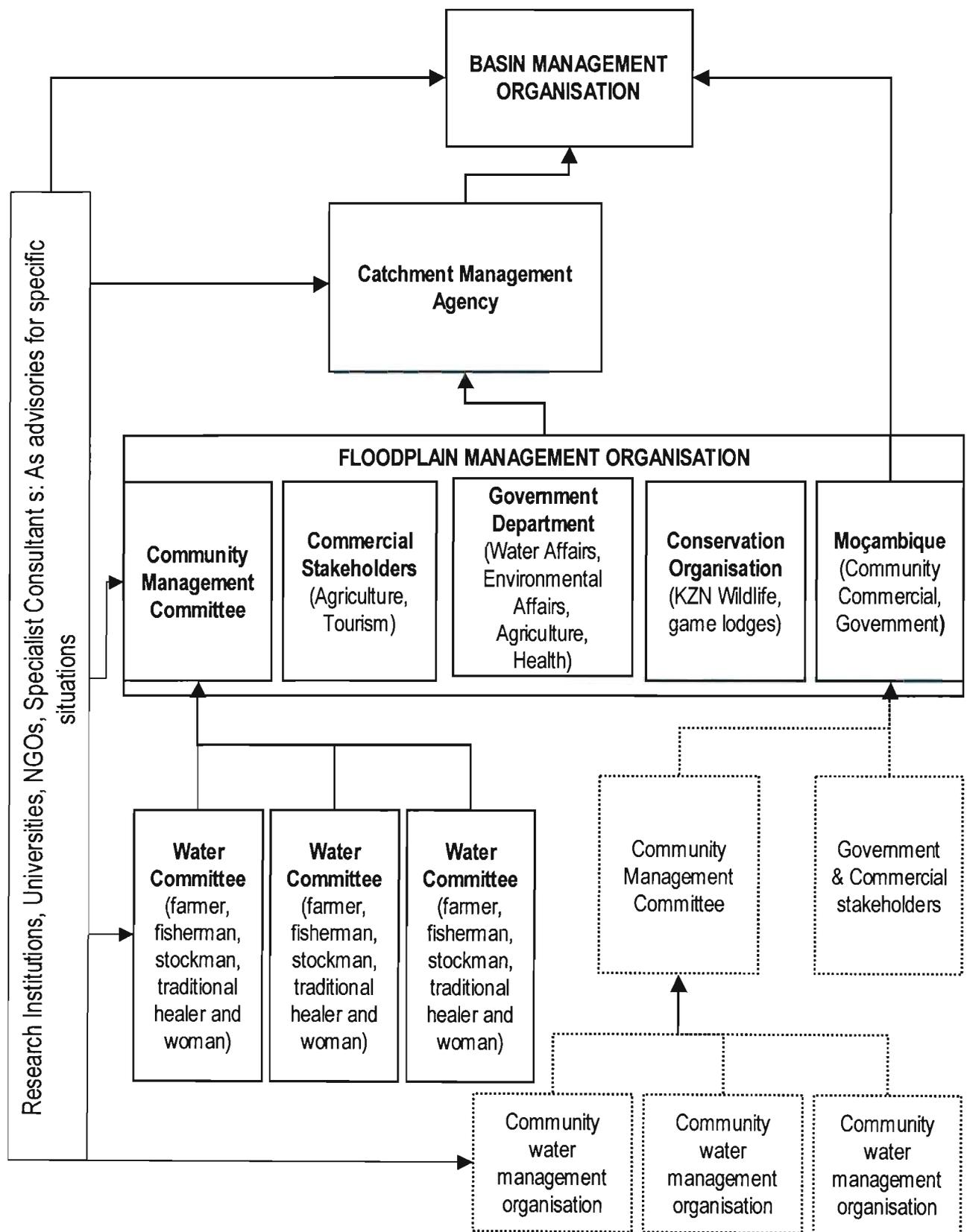


Figure 9.2: Organisational structure for a floodplain management organisation

The issue of control is a constraint to the devolution of decision-making power to local water user groups in a participatory process. In an African context, the resource that will best contribute to effective implementation of international agreements and national water laws, is the expertise of local people whose interaction with their environment, and knowledge of local conditions can provide cost-effective information to a basin management organisation.

It is also important that the basin is recognised as a system (Poultney *pers. comm.* 2002), and that benefits to downstream users can only continue if the most sensitive parts of that system are protected, the upper catchments, important wetlands and areas of ecological significance. One of the most important elements of integration, therefore, is "to develop mechanisms to facilitate resource transfer from beneficiaries downstream to the protection of upper watersheds and other regions of critical importance" (IUCN / AfDB 1999: 41). A first step toward the development of these mechanisms is the identification of users and their demands. The Incomaputo agreement has scheduled this step as one of the last in the comprehensive basin study. This needs to be addressed as soon as possible in order to institute systematic management of the basin.

iii) Floodplain management in the area of study

The analysis performed on the community participation assessment (Figures 8.3 and 8.4) shows that the area where the highest concentration of resources is required is that of incentives to participate in the management organisation. A closer analysis of the details of the 'Incentives' category (Appendix 5) reveals two predominant areas of concern.

Firstly, there is a need for an explanation of the provisions and implications of public participation policy and legislation, to community stakeholders, and among government representatives responsible for its implementation. Secondly, most participation has taken place regarding, specifically, releases from the Pongolopoort dam, and their timing. This has resulted in a lack of understanding amongst community stakeholders of the sharing of benefits of floodplain resources. This suggests that there is a need for an exploration, with community stakeholders of the types of benefits the floodplain provides and the implications of their own activities on those benefits and on other stakeholders deriving benefits from other activities on the floodplain. This must be done in a form which should be widely understandable, but as yet, no such exercise has been performed with a variety of community stakeholders. This

contributes to a more integrated perspective, which will improve understanding between stakeholders, build trust, both between government stakeholders, and between the community and government, and reduce the possibility of conflict once a management organisation is formed.

A second category, that of stakeholder confidence, is also an area of concern. Despite the perception within DWAF that “we feel that we've got a fair understanding of stakeholder needs and aspirations” (van Wyk *pers. comm.* 2002), after extensive research and experience on the floodplain, Bruwer (*pers. comm.* 2002) insists that “that has never been tested”. A closer look at the details of this category reveal that the understanding and explanation of roles and responsibilities of all stakeholders is required prior to the formation of a management organisation.

Participation on the Pongolo floodplain has taken place primarily with DWAF, as the dam is seen as “a DWAF issue” (Arendse *pers. comm.* 2002). Given that the dam is an integral part of the ecological functioning of the floodplain, from which community benefits are derived, other government stakeholders' roles require clear definition. There are two major implications of this:

- That other government departments need to understand their own roles and responsibilities
- That DWAF needs to broaden the “dam issue” to include other government departments.

This will allow the floodplain management organisation to function within the existing legal frameworks, as well as providing the guidelines for information that the organisation is required to provide to the various government stakeholders. Having those guidelines will significantly improve the local and indigenous people's confidence, and contribute to capacity building within the community and government. It will also ensure that government departments receive the correct information in the correct form from people already on the ground, which should bring about a more cost-effective implementation of new laws such as the National Water Act 36, of 1998.

Although the other categories of this community participation assessment show relatively high scores, there are some elements which arise from the detailed analysis which require comment.

There are currently no operating rules for the Pongolopoort Dam, as the existing operating rules were formulated at construction of the dam and have never been adjusted for changing upstream or

downstream activities. As a result of this, the DWAF preference for an unseasonal September / October release is based on “a need to create volume before the rainy season” (Mwaka *pers. comm.* 2002). For this reason, it is impossible to formulate monitoring and evaluation objectives and methods, since there is no certainty as to the amount of water available. The lack of management objectives has resulted in water management in this area becoming “crisis management” (Arendse *pers. comm.* 2002), rather than strategic management of water resources, which makes sustainable and equitable use difficult to achieve. It is therefore a priority that operating rules are balanced in accordance with the needs of the community and the ecological needs of the floodplain. Therefore, it is important that the community (especially the downstream community) understand the functioning and operation of a large dam. This will also assist DWAF to define more clearly its own requirements, and promote cooperation from the community.

There is no integration between management of the floodplain, and management of the catchment as a whole. Although the area of study is, in a sense, separated from the upper basin by the dam, upstream activities do affect the amount available for release. Given that the only water available on the floodplain is in the river and pan system, this could be a significant factor in drought years, and therefore integration requires a strategic and systematic approach. Smaller management organisations responsible for a defined area, under an overall basin commission could address this issue.

iv) A strategy for sustainable resource use

Having analysed the two tiers of the conceptual framework (Figure 3.1), transboundary water management and the local context of the Pongolo River / Rio Maputo, it is important now, to apply that to a strategic framework (Figure 9.3) in order to assess what is in place, and where resources need to be concentrated to improve the efficacy of basin management and move toward sustainability

TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO RIVER / RIO MAPUTO

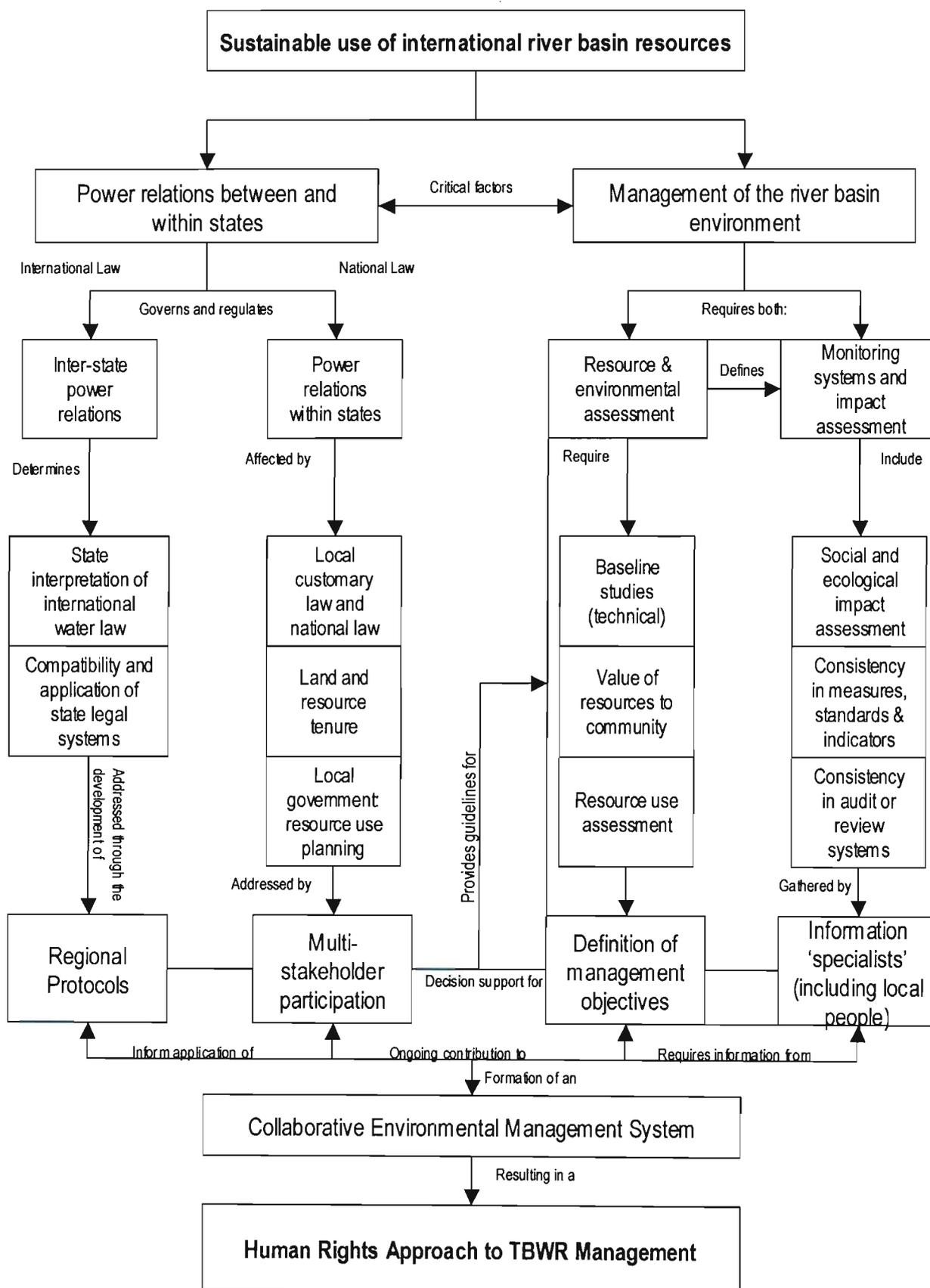


Figure 9.3: A strategy for sustainable resource use

a) *Power relations between states*

The Incomaputo agreement, with its emphasis on technical issues, does to an extent perpetuate inequalities in power relations. It is based on legal frameworks which have been shown to be inadequate in addressing state power inequalities. It is also skewed heavily toward technical measurements, for which South Africa has more resources and experience in using. The SADC Protocol does not adequately address this issue, but recognition within the Incomaputo agreement that the basin is an integrated and interdependent system might promote more equity between riparian states.

b) *Power relations within states*

This and other research has highlighted the lack of recognition of local customary laws with regard to resource use. In the area of study local users have attempted to involve themselves in water management in their area, with little success. Despite political tensions between tribal and municipal systems in these areas, local people have designed their own management systems which address those issues and therefore can provide an invaluable resource to water control authorities in the implementation of new water laws. Systems such as this one, with effective and committed support from the relevant government departments, can be used as models for participatory management in other areas. Such support for local management systems can also address resource tenure insecurity, and therefore improve the effectiveness of the implementation of legislation and management objectives.

c) *Environmental management*

This analysis has illustrated the emphasis on technical issues in water management, those issues having dominated water management internationally for over 50 years. Given the increase in water demand, social issues and the value of water and environmental resources to communities cannot continue to be measured in only technical terms. This necessitates the inclusion of staff with skills in this area in the assessments of available water resources and in the definition of integrated water management objectives.

Furthermore, ongoing monitoring and impact assessment of the changing characteristics and uses of international basins is fundamental to the success of international agreements. Here again, the importance of social issues must not be overlooked in favour of technical standards and indicators. By

making the monitoring of these indicators and standards the responsibility of local “information specialists” (Mohammed-Katerere 2001), who should receive the appropriate training and authority to implement them, those concerns can be more easily incorporated. A system such as this would build capacity in local users and well as significantly improving relationships between users and water authorities. Furthermore, the financial requirements of supporting a network of local auditors, as opposed to centralised auditing, and its attendant costs, are considerably lower, which should be attractive to authorities whose financial resources are consistently constrained.

10. CONCLUSION

Analysis of current trends in transboundary water management has shown that although the approach to many agreements remains state-driven, there is a move toward the inclusion of local users’ and ecological concerns. Both the UN Convention and the SADC Protocol provide frameworks for the inclusion of such concerns into bilateral and multilateral agreements, though operationally, this has not been achieved to a significant extent. There is an overwhelming emphasis on technical measures, and little effective implementation of social and ecological requirements into transboundary basin management systems. This is primarily as a result of extensive experience with technical measures in water management, the fact that environmental costs and benefits are more difficult to measure and assess, and benchmarks are seldom agreed between co-riparians with dissimilar environmental management systems.

Research into the measurement of social costs and benefits in international water management at the level of the individual is relatively new and has, for the most part, been excluded from water management agreements. This is often as a result of the strategic importance of water to riparian states, which leads to a perception of a need for secrecy surrounding international water negotiations. However, because of the increasing discourse around human right to water, (though it is not yet explicitly stated in international law), states entering into water agreements are beginning to consider methods to include local users, especially in the implementation phase. Collaborative management is seen as one way to achieve this, but to move toward effectiveness, higher levels of transparency in the negotiation and implementation phases of international agreements are required.

The creation of institutional management structures which effectively employ the efforts of local users and communities is, as yet, uncommon in transboundary management, though there is recognition of the need for such structures.

In the Maputo basin, the recently signed Incomaputo agreement has not yet reached the level where the concerns of local users are considered and the TPTC is not yet an organisation which demonstrates the levels of transparency and accountability which have been shown to be so critical to effective transboundary water management. However, in the study area (below the Pongolopoort Dam), communities are deeply involved in water management, but institutional support and the level and extent of their effective involvement is in the process of being devised through programmes at a local level. It is important that lessons from such programmes be translated to an international level through basin-wide integration efforts. Programmes which have managed to achieve this to a large degree do exist, and lessons from these programmes (such as the IUCN Sahelian Wetlands Project) could be incorporated with political will.

Other sectors such as the health sector have provided lessons in the inclusion of local communities on the Moçambique side, where a severe lack of infrastructure could have undermined successful efforts. The Regional Malaria Control Council programme could advise or provide community communication structures for the water sector, at the same time as it improves inter-sectoral management, which would result in a move toward a more integrated approach.

A major constraint to effective transboundary water management (even national water management) is the sectoral approach to water. Traditionally, Water Affairs departments in most nations are responsible for the nation's water, an approach which is prevalent in both Moçambique and South Africa. Other departments, such as Agriculture, Environmental Affairs and Economic Development are seldom included in transboundary basin negotiations, a situation which to a large extent constrains the sustainable management of the basin, as strategic and integrated management is impossible if the concerns of only one sector are considered. The legal systems in both Moçambique and South Africa have addressed this, as both make provision for ecological considerations and for public participation in water management. It is in implementation of these progressive laws that a great deal of effort remains

necessary. This is unlikely to become a reality without a significant change in current mindset and political will.

With the Incomaputo agreement, formulated primarily for management of the highly-stressed Incomati basin, and not set to impact the Maputo basin for some time (van Wyk *pers. comm.* 2002), there is an opportunity to address these issues now. The last two years have seen extensive development in natural resource management systems thinking and new ideas abound. Communication between riparian states has been achieved despite historical and political differences, and substantial disparities in financial resources. Applied strategically, this area could represent pioneering innovation in moving toward sustainability in the management of international water resources.

11. RECOMMENDATIONS

- More effective communication, using formal communication mechanisms, between government departments, especially those responsible for water and environmental affairs, with regard to strategic management and development of water resources and their dependent populations and ecological systems. This is especially important in project coordination in specific areas
- Operational transparency in organisations, such as the TPTC in order to facilitate understanding by local resource users and to improve efficiency in the implementation of agreements
- An understanding of the shortcomings of existing international water agreements, which will allow more effective integration of new techniques for their formulation into new agreements.
- A methodical integration of methods to address those shortcomings in River Basin Commissions, which include local user participation in both the development and implementation stages
- Study into the possibility that local user management organisations can be organised in areas with geophysical characteristics, rather than be determined by political boundaries
- Study into the possibility of using existing communication networks, such as the Regional Malaria Control Council to improve local user participation in water management across boundaries, and to incorporate indigenous resource management techniques
- A devolution of power to make decisions to local actors in resource management organisations supported by the relevant government departments

- A stakeholder identification study, the terms of which are agreed to be all government departments involved and which includes previously unrepresented and previously disadvantaged stakeholders and their concerns, abilities and resource uses
- Clear definition of government stakeholder roles and responsibilities, which can then be integrated into the management objectives for the floodplain. It follows that a set of management objectives must be agreed by stakeholders who then have the power to implement those decisions
- Best-use of water resources studies which include the possibility of curtailing existing uses and which include social impact assessments
- More comprehensive study of indigenous resource management techniques and their incorporation into controlling authorities' management strategies
- A shift in management focus from releases (from the dam), to ecological management, thereby incorporating the concerns of government departments which regulate agriculture and environmental management objectives
- A clearly defined set of operating rules for the Pongolopoort Dam, which have been negotiated with local users
- A comprehensive explanation to local users of the functioning of large dams to facilitate their understanding of its requirements, so that their contribution to the formulation of the operating rules is effective and informed
- Methods to include local users in the provision of required environmental monitoring information to a range of authorities
- More effective use of research conducted into the effective use of large dams, such as the Dams and Development Report produced by the World Commission on Dams (2001).

12. ACKNOWLEDGEMENTS

Thank-you to Dr Nevil Quinn for his patient supervision and support, Michael Horswell for his GIS work and Carrin Martin at the Medical Research Council for providing Moçambique GIS data, and all who gave of their time and experience in interviews, especially Mr Niel van Wyk of DWAF, for not only agreeing to a second interview, but also providing extensive documentation on the Incomaputo agreement and the TPTC.

REFERENCES

Arksey, H and Knight, P. 1999. *Interviewing for Social Scientists: An Introductory Resource with Examples*. London. SAGE.

de Chazournes, LB. 2000. *The UN Convention on International Watercourses: Prospects for an Unfinished Agenda for Co-management* [Online]. Washington D.C. Paper presented at the Conference on "Water, Dispute Prevention and Development: South Perspectives". Centre for the Global South. American University. Available at: <http://www.american.edu/maksoud/water98/present7.htm>. [Accessed: 15 August 2002].

Dowdeswell, E. 1998. Where Peaceful Waters Flow. *Water International* 23: 13-16.

Elmusa, SS. October 1998. *Harmonising Equitable Utilisation and Significant Harm* [Online]. Washington D.C. Paper presented at the Conference on "Water, Dispute Prevention and Development: South Perspectives". Centre for the Global South. American University. Available at: <http://www.american.edu/maksoud/water98/present7.htm>. [Accessed: 15 August 2002].

Glieck, PH. 1999. The Human Right to Water. *Water Policy* 1 (5): 87-503

Glieck, PH. 1998. *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*. Island Press: Washington D.C.

Glieck, PH. 1998. Water in Crisis: Paths to Sustainable Water Use. *Ecological Applications* 8(3): 571-579.

Godwin, P. Without borders: Uniting Africa's wildlife reserves. *National Geographic* September 2001: 2-29.

Green Cross International. 1999. *National Sovereignty and International Watercourses*. Paper prepared for the World Commission on Water for the XXI Century. Green Cross International: National Sovereignty and International Watercourses Panel. Geneva. Switzerland.

IUCN / African Development Bank. 2000. Sahelian Floodplains, Challenges and Perspectives: Proceedings of the Regional Conference. Yamoussoukro 7-9 October 1999. Burkina Faso. IUCN Regional Office for West Africa.

Heeg, J and Breen, CM. 1994. Resolution of Conflicting Values on the Pongolo River and Floodplain (South Africa). In: B.C. Patten et al (eds). *Wetlands and Shallow Continental Water Bodies 2*: 303-359. SPB Academic Publishing. The Hague. The Netherlands.

Heeg, J and Breen, CM. 1982. Man and the Pongolo Floodplain. *South African National Scientific Programmes Report No. 56*. Council for Scientific and Industrial Research.

Katerere, Y, Hill, R and Moyo, S. 2001. *A Critique of Transboundary Natural Resource Management in Southern Africa*. Paper 1: IUCN-Regional Office of Southern Africa Series on Transboundary Natural Resource Management in Southern Africa [Online]. Available at: <http://www.iucnrosa.org.zw/tbnrm/publications.html>. [Accessed: 12 August 2002].

Knoop, JM, van Puijenbroek PGM, Wortelboer, FG. 1996. *Lindane: use, emissions and fate in the Rhine Basin* [Online]. Report for Rijksinstituut voor Volksgezondheid en Milieu (RIVM). Available at: <http://www.rivm.nl/bibliotheek/rapporten/733008003.html>. [Accessed: 7 September 2002].

Kuylentiera, J and Najlis, P. 1998. The Comprehensive Assessment of the Freshwater Resources of the World – Policy Options for an Integrated Sustainable Water Future. *Water International*. 23: 17-20.

Leestemaker, JH. 2000. *An analysis of the new national and sub-national Water Laws in Southern Africa: Gaps between the UN Convention, the SADC Protocol and national legal systems in South Africa, Swaziland and Moçambique* [Online]. Paper for the Institutional Support Task-team of the

Shared River Initiative on the Incomati River, Southern Africa. Available at:
<http://www.thewaterpage.com/leestemaker.htm>. [Accessed: 31 July 2002].

Margerum, RD. 2001. Organisational Commitment to Integrated and Collaborative Management: Matching Strategies to Constraints. *Environmental Management* 28(4): 421 – 431.

Milich, L and Varady, RG. 1998. Openness, sustainability and public participation in transboundary river basin institutions [Online]. *Arid Lands Newsletter* 44. Fall / Winter 1998. Available at:
<http://ag.arizona.edu/OALS/ALN/aln44/varady-milich1.html>. [Accessed: 31 July 2002].

Mohammed-Katerere, J. 2001. *Review of the Legal and Policy Framework for Transboundary Natural Resources Management in Southern Africa*. Paper 3: IUCN-Regional Office of Southern Africa Series on Transboundary Natural Resource Management in Southern Africa [Online]. Available at:
<http://www.iucnrosa.org.zw/tbnrm/publications.html>. [Accessed: 12 August 2002].

NetCoast. 2001. *Twinning of river basin organisations* [Online]. NetCoast. The Netherlands. Available at: <http://www.netcoast.nl/projects1/twinning.htm>. [Accessed: 17 March 2003].

Neuman, W.L. 2000. *Social Research Methods: Qualitative and Quantitative Approaches*. Boston, USA: Allyn and Bacon.

Savenije, HHG and van der Zaag, P. 2000. *Towards the improved management of shared river basins: Lessons from the Maseru Conference*. Policy 2: 47-63.

Tompkins, RL. 2002. *Transboundary water resource management of the Pongolo River / Rio Maputo*. Unpublished Research Component. University of natal, Pietermaritzburg.

Van der Lee, J. 2002. An Integrated Learning Approach to River Basin Management. *Resources Policy* 8(1): 11-13.

Van der Lee, J.J. 2000. *Participative water resource allocation and decision-making in Australia*.

Proceedings of the Xth World Water Congress, Melbourne, 12-17 March 2000.

Wolf, A.T. 2000. *Indigenous approaches to water conflict negotiations and implications for international waters* [Online]. Transboundary Freshwater Dispute Database. Available at:

<http://terra.geo.orst.edu/users/TFDD/documents/indigenous/index.html>. [Accessed: 8 September 2002].

PERSONAL COMMUNICATIONS

Mr C Arendse, Control Technician, Northern Catchment Management area, KwaZulu-Natal Department of Water Affairs and Forestry. (031) 336-2700.

Mr TJ Buthelezi, Chairman POWADETA. 082 362 292.

Mr P Conant, Co-ordinator - Resource Use, Ezimvulo KZN Wildlife. (035) 870-0552.

Mr S Goedste, Manager, Makhatini Research Centre, KwaZulu-Natal Department of Agriculture (Jozini). (035) 572-5303.

Mr JK Gumede, Chief Health Inspector, KwaZulu-Natal Department of Health (Jozini). (035) 572-1021.

Ms C Hanekom, Research Technician, Ezimvulo KZN Wildlife. (035) 592-0001.

Dr J Jaganyi, Research Fellow, University of Natal, Pietermaritzburg. (033) 260-5547

Mr BC Nkabinde, Head of Department, Control Development Technicians, KwaZulu-Natal Department of Agriculture (Jozini). (035) 572-1011.

Mr M Nxumalo, Scheme Manager, Shemula Water Supply Scheme. (035) 592-1046.

Mr J Perkins, Chief Engineer: Water Resources, KwaZulu-Natal Department of Water Affairs and Forestry. (031) 336-2700.

Mr C Poultney, Social Anthropologist, Consultant and Resident of the floodplain. 082 491 0062

Mr W Urquhart, Deputy Director, KwaZulu-Natal Department of Agriculture. (033) 343-1397.

Mr N van Wyk, Director, Water Resource Planning, Department of Water Affairs. (012) 336-8327.

APPENDIX 1
LIST OF INTERVIEWEES

**INTERVIEW LIST FOR TRANSBOUNDARY WATER RESOURCE MANAGEMENT OF THE PONGOLO
RIVER / RIO MAPUTO**

Name	Position
Mr Francisco Alvaro	Moçambique Liaison to Tripartite Permanent Technical Committee (TPTC)
Mr Clive Arendse	Control Technician, Northern Catchment Management area, KwaZulu-Natal Department of Water Affairs and Forestry
Mr Charel Bruwer	Environmental management consultant, previously with DWAF (release controller for Pongolopoort Dam until 1998)
Mr. T. J. Buthelezi	Resident of the Pongolo floodplain, Chairman of POWADETA and the Ubongwa Board (cotton and subsistence farmers on the Pongolo floodplain), Chairman of the Makhatini Farmers Association, GM cotton farmer.
Dr Mark Dent	Consultant in Water Resource and Collaborative Management, previously of Computing Centre for Water Research
Ms Lorraine Fick	Senior Specialist, Social and Ecological Services Directorate, DWAF
Mr Haroon Karodia	Chief Director Environmental Management, KwaZulu-Natal Department of Agriculture and Environmental Affairs.
Mr Jeremiah Mabika	Farmer and member of the Welcome Water Committee
Mr Beason Mwaka	Chief Engineer, Systems Operations, Eastern region, DWAF
Mr Clive Poultney	Consultant, residents and founding member of Mboza Village Community Project on the Pongolo floodplain
Mr Brian Sharp	Director of the Regional Malaria Control Commission (Community driven malaria control programme)
Mr Niel van Wyk	South Africa Liaison to the TPTC, Director of Water Resource Planning (DWAF National)
Mr Andrew Zaloumis	CEO Lubombo Spatial Development Initiative

APPENDIX 2

INTERNATIONAL TRANSBOUNDARY WATER MANAGEMENT ANALYSIS

Appendix 2: Analysis of selected Transboundary River Basin Agreements

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Basin states	US and Mexico	Switzerland, Germany, France, Luxembourg, Liechtenstein, Austria, The Netherlands	Israel, Jordan, Syria, Lebanon and Palestine	Angola, Namibia, Botswana	Angola, Botswana, Malawi, Namibia, Tanzania, Moçambique, Zambia and Zimbabwe	South Africa, Swaziland, Moçambique
International, regional agreements, other basin agreements (Signed and ratified)	UN Convention (1997), North American Free Trade Agreement (NAFTA) (1994), which established the Border Environment Cooperation Commission (BECC) and the North American Development Bank (NADBank) ¹	UN Convention (1997), Commission of the Protection of the Rhine against Pollution (Bern Convention) (1963), Rhine Action Plan against chemical Pollution (1987), Action Plan on flood defence (1998) ² , EU Water Directive ²⁰	Revised Unified Plan, (Unsigned Treaty) (1955), Israeli-Palestinian Interim Agreement (West Bank and Gaza Strip) (1995) ³	SADC Protocol (1995 Revised 2000) ⁴	SADC Protocol (1995 Revised 2000), Zambezi River Action Plan (ZACPLAN) (1987) ⁴	UN Convention (1997)(SA only) SADC Protocol (1995), Joint Water Commission (SA-Swaziland), Sabi River Agreement (SA-Moçambique) ⁴ Komati Basin Water Authority (South Africa and Swaziland) (1992) ¹¹
Institutional Agreement	International Boundary and Water Commission (IBWC)	International Commission for the Protection of the Rhine (ICPR)	Israel-Jordan Joint Water Commission (IJJWC)	Okavango River Basin Commission (OKACOM)	Zambezi River Authority (ZRA)	Tripartite Permanent Technical Committee (TPTC)
States involved in agreement	US and Mexico	Switzerland, France, Luxembourg, Germany, The Netherlands	Israel and Jordan	Angola, Botswana and Namibia	Zambia and Zimbabwe	South Africa, Swaziland and Moçambique
Date of agreement	1944	1950	1994	1994	1987	1993
Legal Basis for agreement	National Acts, UN Convention, NAFTA ¹	UN Convention, EU Regulations, national acts	The Washington Declaration (Peace Treaty) ¹	SADC Protocol, national acts ⁴	National acts at time of formulation ⁴	SADC Protocol, national acts
Background	In 1944, once again at a high level of government, the US and Mexico signed a treaty which, among other provisions, was to regulate the Rio Grande "in order to obtain the most complete and satisfactory utilisation thereof". ⁵	As a result of high levels of pollution from significant industrial use, and flooding from increasing development along the river, the Netherlands instigated the negotiation process ⁶ Decisions of this agreement are not legally binding ⁶	Formulated as annexure to the 1994 Peace Treaty between Jordan and Israel. It concerns not only the Jordan basin, but also the Yarmouk basin and the Araba / Arava groundwater aquifer ¹	Formulated as a result of increasing demand in Namibia and Angola, coupled with the ecological importance of the Okavango Delta and its significance for Botswana ⁷	Formulated at dissolution of Central African Power Corporation (CAPCO), mainly for maintenance of Kariba and to assess other opportunities for power generation ⁸	The TPTC was created between South Africa, Moçambique and Swaziland. Ostensibly, the organisation was to address issues relating to the Incomati, Limpopo and Maputo basins. ¹⁰ However, it has been associated primarily with the Incomati basin (until the Incomaputo agreement was signed) ⁴

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Relative power (economic & political) of parties involved	Despite the obvious differences in economic and political power, Mexico is the upstream state (Rio Bravo) and the guarantees a minimum flow to the US according to the 1944 Treaty. In May 2002, conflict has arisen as a result of lack of drought planning, which has resulted in a significant 'water debt' owed to the US ¹³	Similar, and EU is officially a signatory ²	Israel is militarily the most powerful state in the basin, and is also the upstream user – effectively controls the basin ¹	Lack of infrastructure in Namibia and Angola, and relative stability in Botswana highlight some inequalities. ⁴ A plan to pipe water into Windhoek resulted in Botswana turning to NGOs to highlight the Okavango Delta through rallying civil society by forming the Okavango Liaison Group, which includes tourism associations, NGOs and Botswana University representatives. ⁴ This demonstrates a somewhat more subtle use of power than South Africa has demonstrated on the Incomati	Zimbabwe owns most infrastructure, most functions carried out by Zimbabwe. Only 10% of employees in the ZRA are Zambian ⁸	South Africa is by far the most powerful user, and the upstream state. Significant agricultural development in South Africa has resulted in a high population density, and large-scale irrigation infrastructure established in the apartheid era for white sugar farmers and commercial forestry. Despite negotiated minimum flows, Moçambique has claimed that South Africa farmers have stored water from the Incomati in dry years, and at times, the river has stopped flowing ¹⁴
General approach	High-level government, technical, standard-driven ¹	State-level agreement, standard-driven except on short-term projects ²	Highly technical, very high-level government, water issues intertwined with larger political issues ⁹¹	Collaborative process in management and implementation, not in formulation ⁴	Agreed at high government level (top-down, deeply intertwined with political rather than water management matters ⁸	Agreed at a high level by government officials. Minimum flow guaranteed into Moçambique is 2m ³ s ⁻¹ . which was agreed in 1991 in Piggs Peak, Swaziland ¹²
Representation of communities/ local users (left to state or in agreement)	Left to state – though again, the proposed sustainable management plan offers possibilities	Left to state – working and project groups are comprised of experts and state officials. Above that, co-ordination group is responsible for decisions. This year, 'observer status' to the Plenary sessions has been granted to several NGOs including Greenpeace and WWF.	Left to state – given the prevailing political frameworks, and the Palestinian Crisis, with its attendant effects on state relations, this is very unlikely to change in the near future	Left to state – stakeholder representation through regional steering committees. Environmental NGOs have increased the level of community involvement but mostly in Botswana	Left to state – agreement concerns mainly strategic power requirements. The ZRA deals less with water allocation as maintains water development infrastructure and initiates projects to extend development ⁴	Left to state – no community, representation in any of the processes of the TPTC, which seems largely ineffectual given that Moçambique has threatened litigation in the International Court of Justice, and the environmental state of the Incomati river is critical at best ¹⁸

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Extent of public participation (PP) in formulation of agreement	None – state level	Very little – high industrial use state actors prioritised state and business interests	None – security issues and secrecy severely limit information flows	None – state level	None	None
PP in agreement implementation	None – very technical, state and experts, but proposed bi-national summit offers some possibilities	None – state and experts	None – security issues and secrecy prevail	Relatively good – through Environmental Impact Assessment and Transboundary Diagnostic Analysis ⁴	None – state employees	None – state representatives
Provision for environmental needs	Very little, especially given that the Rio Grande stopped flowing as a result of critically low flows. ¹⁶ There is a concentration on agricultural use and water allocation to states, not environmental requirements, though the proposed “sustainable management” plan is yet to materialise	Relatively high, but more from a pollution perspective. The Rhine is distinguished in this review by being a navigable river with a high level of industry in the basin – though recently the ecosystem perspective is being supported in the Plenary sessions by NGOs ²⁰	Very little, as the agreement is focused on water allocation, and not overall environmental management. The Sea of Galilee is at its lowest level in 60 years, and upstream abstraction from Israel and in Jordan from the East Ghor Canal often leaves flows critically low ⁹	Relatively good, but Angola's political problems have kept her out of many of the processes of OKACOM, a situation which may test the provisions of the agreement as the country pays more attention to social and economic development than the civil war has previously allowed	None - the focus of this agreement is not water management, but rather hydropower	None – the focus of this agreement was primarily allocation for both agricultural use in South Africa and Swaziland and to appease Moçambique with a minimum flow. It perpetuates existing uses, which have proved unsustainable at current rates of use, while stunting the development opportunities of Moçambique
Management focus: <ul style="list-style-type: none"> • Allocation • Management • Development 	All – the recent NAFTA agreement gave rise to NADBank, which has opened funding for conservation initiatives and hydropower infrastructure. The population of the basin is approximately 12 million, with urban, industrial and agricultural uses across the spectrum	All – the problem is that the organisation attempts to standardise management across diverse countries, uses and geographic characteristics. The very high industrial use of the river, coupled with pollution accidents, and the non-legally binding standards set, has resulted in “objectives for water quality and emissions in conflict” ¹⁹	Primarily allocation – these are very arid areas, and Jordan was experiencing extreme water stress. Water issues were very high on the agenda of the Peace Treaty negotiations. Some management functions in terms of quality regulations in the agreement ¹	All – environmental assessment is included, regional steering committees for technical processes, currently undertaking an Integrated Basin Management Plan – funded through Global Environment Facility & IUCN ⁴	Development – mainly regarding hydropower (Kariba Dam), conflict resolution mechanisms included (unsuccessful)	Unclear – the TPTC is intended to address allocation, development and conflicts on the Limpopo, Incomati and Maputo Rivers, but even the name “Technical Committee” denotes inadequacies in management focus

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Management style	Traditionally, management has been top-down and regulatory through the 1944 Treaty. A high-level government meeting in July 2002 has proposed a summit to include water users and experts, to fund water conservation initiatives and improve hydropower infrastructure. The task of the summit will be to propose a 'joint sustainable management plan' ¹⁷	Highly technical, standard driven. Coordination group made up of experts and senior national officials make up three permanent groups (quality, ecology and emissions) and two project groups (sustainable development and flood defence)	Highly technical. All measures are generally volumetric, little effective co-operation and collaboration in management of the basin. Given the political strife in the area, openness and communication are ineffective, and disputes frequent	Relatively collaborative through regional committees and through the draft Transboundary Diagnostic Assessment (baseline data) ⁴	Commercial, political (at a high level). Essentially, the ZRA has had little to do with water management on the Zambezi. It has instead served to highlight conflict areas between the two member nations. "Hydro-political issues and differences are intimately woven into the fabric of the two states' bilateral actions" ^{8,36}	Many sources on the TPTC cite is as not having been effective (Glieck 1998; Leestemaker 2000; Allison 2002), which has essentially resulted in the Incomati being seriously over-utilised within South Africa, to the point that salinity of the lower reaches is beginning to have an economic impact ¹⁸
Monitoring: quantity, quality, supply, and allocation	Again, the ongoing conflict and critical environmental state of the river (to the point that it is dry at the mouth), indicates ineffective monitoring	Highly standard-driven management. Difficult to set and maintain rigorous standards across such diverse uses and population densities	The political conditions are not conducive to a free flow of information, which exacerbates conflict and makes monitoring all but impossible	Monitoring is ineffective at the moment, but current plans should improve. The agreement "provides a useful framework for collaboration" ⁴	None – no real management objectives and internal political woes	Weak – the critical ecological state of the river illustrates clearly the lack of effective monitoring
Regulation and enforcement of provisions of agreement	Despite the presence of experts, the significant 'water debt' owed by Mexico according to the 1944 Treaty indicates Treaty's provisions are ineffectively regulated	Recent inclusion of NGOs suggests a need for improvement of ecological management, but it is acknowledged by this move as opposed to ignored	Once again, the lack of information flows, and ongoing conflict in the region makes regulation of the provisions of this Treaty very difficult. Water issues are not separated from other areas of conflict ⁹	To date, there has been little enforcement, but the low population density of the river and lack of industrial use and water infrastructure has assisted	Weak – political upheaval, capacity problems	Weak – this agreement has proved to be largely ineffective in terms of sustainable water management – a function of the inequality under which it was formed
Current projects in the basin with transboundary water management effects	The Border Environment Cooperation Commission (BECC), established as a side agreement to NAFTA with a social-environmental focus. However, 1944 Treaty and IWBC remains in force ¹	Proposed "twinning" of river management organisations in member countries where solutions cannot apply for the whole basin, under a River Authority with executive powers ²⁰	None	"Every River" Project, attempting to balance local user needs in Namibia, Botswana and Angola from a social, economic and environmental perspective ²¹	ZACPLAN projects (SADCWCSU)	Shared Rivers Initiative (2000) – involving experts and multidisciplinary task teams from all three countries, but no public participation ¹⁸

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Member perceptions of allocation equity	Conflict has been fairly consistent since the 1944 Treaty, but recent drought in Mexico has exacerbated the problem, with Texan farmers accusing Mexico of "hoarding water" ¹⁶	Though it is not stated explicitly in the referenced reports, there is an underlying current that the pollution issue is far from resolved within the ICPR	The bilateral nature of the Treaty excludes other riparians. Palestine's perceptions of inequity well known	Possibility that Namibia will seek litigation in the International Court of Justice over its (currently postponed) plans for a pipeline to Windhoek, which Botswana opposes. Angola's involvement has been hampered by its political problems	Zambian news reports have criticised the ZRA for an imbalance in infrastructure development favouring Zimbabwe. Zambia, has vetoed on the Batoka Gorge project, apparently hindering Zimbabwe's ability to address domestic power needs ⁸	Moçambique's perception of inequality is so marked that it has threatened to take South Africa to the International Court of Justice over this issue, but to date it has not done so ¹⁵
Conflicts and disputes	Many – as documented though this column, conflict across the border has been fairly consistent since the Treaty was signed in 1944. As recently as 2002, US President George Bush had an urgent meeting with Mexico's President Fox over water issues in this basin ¹⁶	The major driver of disputes on the Rhine is pollution. The 50-year old ICPR is inadequate in that it attempts to provide technical solutions to these problems from a basin-wide perspective, which often conflicts with internal systems in member countries	The Jordan river basin has generated fairly consistent conflict since the Arab Headwater Diversion Project in 1965 was attacked by Israeli artillery. ¹ The IJJWC does not have as much conflict and dispute resolution mechanisms, as it has two Water Commissioners "doing their best to minimise any threat of a new political crisis over water" ¹⁴	War in Angola and lack of development in Namibia, has resulted in less conflict on the Okavango than other major rivers. Increased demand in Namibia has resulted in increased abstraction from the Okavango. The plan to pipe to Windhoek raised a storm of protest, and the possibility of international litigation over water issues. OKACOM has not the mechanisms to deal with such disputes, and despite its environmental focus, needs adjustment for issues such as this, as well as increasing water requirements in Angola	Many – Batoka Gorge project (power), division of assets of CAPCO (original company). Resolution mechanisms within the ZRA have not been applied as a result of the linking of water security and political relations. Political solutions rather than use of ZRA mechanisms	The TPTC has not been successful in dispute resolution on the Incomati. Despite minimum flow requirements into Moçambique, developments on the South African side of the border, such as the Injaka Dam and the weir at Ressano Garcia / Komatipoort have reduced flow below minimum. ¹⁴ The lack of dispute resolution mechanisms in the TPTC is illustrated by the Moçambique threat of international litigation over this problem

	NORTH AMERICA	EUROPE	MIDDLE EAST	AFRICA		
Basin	Rio Grande	Rhine	Jordan	Okavango	Zambezi	Incomati
Extent of marginalised users	Many Mexican farmers are subsistence farmers, and drought has forced them to change to dryland crops. ¹³ The inequalities in the economic power of these farmers (as opposed to Texan large-scale farmers) could affect their representation in the "joint sustainable management plan", if it is instituted	Difficult to assess, given the basin population of 50 million people	The complete lack of public participation in any part of this agreement as well as the prevailing political volatility in the region have marginalized most users of this basin. Its strategic importance has focussed management practice on security, not community	NGO activity has promoted the users of Botswana communities, and the war in Angola has largely kept the focus off integrated water management, but given the condition of the rural poor in Africa generally, it is likely that most users of the Okavango basin are unrepresented	Agreement at level of state only marginalizes all local users and politicises water use and allocation	Moçambique users are highly marginalized. The 20000 islanders on Ilha Josina Machel, illustrate this. As a result of controlled releases by the Incomati Sugar company. The lower part of the island is flooded when planting usually takes place, and the upper part is too dry to grow the staple maize ¹²
Effect on state and local user relations	State relations are significantly friendlier than those between border communities, which are described as acrimonious to the point that "Texas politicians are threatening retaliation over Mexico's failure to live up to its obligations under the 1944 Treaty" ¹³	State relations are genial, but the recent decision to involve NGOs in Plenary sessions and the idea that organisations in separate states should have a local focus and then be "twinning" with other states under a River Authority highlights other necessities	Ongoing conflict between Israel and the Arab states has included water issues even if they were not causal. Water conflicts between Arab states in the highly arid region are also not unusual. The nature of state relations precludes local user involvement	State relations are under pressure from Namibia's threat of international litigation. The Okavango Liaison Committee is separated from the OKACOM process and could create potential conflict	ZRA has exacerbated conflict, rather than assisted in resolving it. Inequalities at the time of its formulation are perpetuated. Conflicts with upstream or downstream countries are not provided for at all,	Relations since the 1994 elections in SA and Moçambique have been relatively good. The threat of international litigation has not been carried out, but there remains a good deal of discord between Moçambiquan communities and local users in SA
Comment	Technical measures, especially those that were formulated over 50 years ago are appallingly inadequate to deal with the levels of complexity in current transboundary water management. Local user involvement is essential in determining fair allocation	The ICPR has a long history of technical cooperation in a fairly stable political system, but this has not resulted in a sustainable river basin. Technical measures and good-neighbourliness are simply not sufficient criteria for successful transboundary management	The technical cooperation between Israel and Jordan in the IJJWC, despite having been unsuccessful in terms of basin management, does represent the possibility that two states, usually in enmity, can cooperate	Potential conflicts resulting from unplanned abstraction in Angola and development in Namibia will put pressure on OKACOM. The agreement highlights "the need to redress the respective rights of state and citizens" ⁴	The ZRA is an example of what not to do in transboundary water agreements ⁴ . It has consistently spawned conflict rather than provided a mechanism for either avoiding or resolving it. A highly sectoral view does not make for successful agreements	South Africa continues to enjoy the benefits of the upstream Incomati, while Moçambique must pay the costs of lack of development. The perpetuation of existing use as a cost to potential uses must be addressed in transboundary agreements

FOOTNOTES TO APPENDIX 2

1. Milich, L and Varady, RG. 1998. Openness, sustainability and public participation in transboundary river basin institutions [Online]. *Arid Lands Newsletter* 44: Fall / Winter 1998. Available at: <http://ag.arizona.edu/OALS/ALN/aln44/varady-milich1.html>. [Accessed: 31 July 2002].
2. Earle, A. 2001. *The Rhine River* [Online]. The Water Page. Available at: http://www.thewaterpage.com/rhine_main.htm. [Accessed: 6 September 2002].
3. Wolf, A. *Transboundary Freshwater Dispute Database* [Online]. Available at: <http://terra.geo.orst.edu/users/tfdd/>. [Accessed: 5 September 2002].
4. Mohammed-Katerere, J. 2001. *Review of the Legal and Policy Framework for Transboundary Natural Resources Management in Southern Africa*. Paper 3: IUCN-Regional Office of Southern Africa Series on Transboundary Natural Resource Management in Southern Africa [Online]. Available at: <http://www.iucnrosa.org.zw/tbnrm/publications.html>. [Accessed: 12 August 2002].
5. International Boundary Water Commission (IBWC). Undated. *Treaty between the United States and Mexico 1944* [Online]. Available at: http://www.ibwc.state.gov/FORAFFAI/body_1944_treaty.HTM. [Accessed: 6 September 2002].
6. Holzwarth, F. 2000. *Transboundary Water Management: A Consultation on a World Bank Strategy* [Online]. Speech given at International Round Table Conference 18-21 June 2000. Available at: [http://inweb18.worldbank.org/essd/essdext.nsf/18DocByUnid/40F957E444C672DC85256B500069767A/\\$FILE/Holzwarth%20dinner%20remarks.pdf](http://inweb18.worldbank.org/essd/essdext.nsf/18DocByUnid/40F957E444C672DC85256B500069767A/$FILE/Holzwarth%20dinner%20remarks.pdf). [Accessed: 4 September 2002].
7. Anon. 2002. *Sharing Water: Towards a Transboundary Consensus on the Management of the Okavango Delta*. Unpublished Proposal by The Natural Heritage Institute and the World Conservation Union (IUCN): Regional Office for Southern Africa (ROSA).
8. Mutembwa, A. 1998. *Water and the potential for resource conflicts in Southern Africa* [Online]. Global Security Felloes Initiative: Occasional Paper No.3. University of Cambridge. Available at: <http://www.dartmouth.edu/~gsfi/gsfweb/htmls/papers/text3.htm>. [Accessed: 6 September 2002].
9. Farinelli, P. 1997. *Freshwater conflicts in the Jordan River Basin* [Online]. Green Cross International. GC Reports. Available at: <http://www.gci.ch/GreenCrossPrograms/waterres/gcwater/jordan.html>. [Accessed: 6 September 2002].
10. Gleick, PH. 1998. *The World's Water 1998-1999: The Biennial Report on Freshwater Resources*. Washington D.C.:Island Press
11. Republic of South Africa National Water Act 36 of 1998 s108.

12. Leestemaker, JH. 2000. *The Domino Effect: A downstream perspective in water management in Southern Africa* [Online]. Paper for the Shared Rivers Initiative Programme. The Water Page. Available at: www.thewaterpage.com/WWW-domino2.PDF. [Accessed: 14 August 2002].
13. Kelly, M and Chapman, K. 2002. *Sharing the Waters* [Online]. Investigative Article for Americas Program at the Interhemispheric Resource Centre. Available at: <http://www.americaspolicy.org/commentary/2002/0205water.html>. [Accessed: 7 September 2002].
14. Allison, P. 2002. *International Water Hotspots* [Online]. In: ITT Industries Guidebook to Global Water Issues September 2002 pp42-43. Available at: www.ittfuidtechnology.com/waterbook/page42.pdf. [Accessed: 14 August 2002].
15. Leestemaker, JH. 2000. *An analysis of the new national and sub-national Water Laws in Southern Africa: Gaps between the UN Convention, the SADC Protocol and national legal systems in South Africa, Swaziland and Mozambique* [Online]. Paper for the Institutional Support Task-team of the Shared River Initiative on the Incomati River, Southern Africa. Available at: <http://www.thewaterpage.com/leestemaker.htm>. [Accessed: 31 July 2002].
16. Anon. 2002. *Dry Rio Grande point of US / Mexico friction* [Online]. Environmental News Service (ENS) 2002. Available at: <http://ens-news.com/ens/may2002/2002-05-17-05.asp>. [Accessed: 7 September 2002].
17. Anon. 2002. *Mexico agrees to release water* [Online]. Environmental News Service at Green Cross International. Available at: <http://www.greencrossinternational.net/DigitalForum/digiforum/articles/article2002/mexicoagrees.html>. [Accessed: 7 September 2002].
18. Anon. 1999. *Scientists meet for Shared Rivers Initiative* [Online]. SA Water Bulletin. Water Research Commission. Available at: www.ittfuidtechnology.com/waterbook/page42.pdf. [Accessed: 8 September 2002].
19. Knoop, JM, van Puijenbroek PGM, Wortelboer, FG. 1996. *Lindane: use emissions and fate in the Rhine Basin* [Online]. Report for Rijksinstituut voor Volksgezondheid en Milieu (RIVM). Available at: <http://www.rivm.nl/bibliotheek/rapporten/733008003.html>. [Accessed: 7 September 2002].
20. Dros, H and van Haselen, C. 2000. *Rhine Basin* [Online]. Synthesis of Session discussions at the Second World Water Forum. Available at: <http://www.worldwaterforum.net/Dossiers/docs/rhinebasin.pdf>. [Accessed: 8 September 2002].
21. *Every River Project Team*. 2001. *Every River has its People: Stakeholder Workshop Report*. Kalahari Conservation Society. Maun. Botswana.

APPENDIX 3
ANALYSIS OF INTERVIEWS AND MEMOS

Appendix 3: Analysis of interviews and memos

	Transboundary structures	Institutional and management structures in the area of study	Water and natural resource management strategies in the area of study	
			Water Resources	Other natural resources
Current status	<p>On the floodplain itself, all communication with Moçambique is informal, except for the Malaria Control Programme (Sharp). Here there are communication structures with trained members of the community, and the involvement of local government which are working well. Feedback from the community in Moçambique on the RMCC has been positive (Sharp).</p> <p>Commonality with other international agreements (van Wyk), but no cognisance of the success or failure of them.</p> <p>Current processes of the TPTC are not transparent in that they do not include members from any other government department (only Water Affairs) across all three countries. Also there is no publication of information arising from meetings, or sharing of that information with Water Affairs departments in the region.</p> <p>Implementation at a very high level and left to state</p> <p>Current dispute avoidance is cumbersome, but recognition that “direct links will have to be built up” (van Wyk)</p> <p>Operating committee “worked before”</p> <p>Transboundary impacts defining characteristic – significant</p> <p>Capacity-building necessity recognised but not actually addressed</p> <p>IFR for ecological well-being is agreed</p> <p>Critical sites for monitoring have been established</p> <p>No structures for “visiting the consequences of our actions” (Dent)</p> <p>No transparency, so the process starts out adversarial (Dent)</p> <p>Four weeks is allowed for the “process” of a release decision to the date of release (Arendse)</p>	<p>No handover within DWAF of management responsibility (Clive Arendse left and Beason Mwaka did not know, no replacement from the regional office went to the release meeting following Arendse resignation).</p> <p>International projects directorate within DWAF not yet suitably staffed (van Wyk)</p> <p>Institutions are polarised between organised conservation on one hand and agricultural institutions, official or otherwise.</p> <p>None supporting diverse livelihoods, so people in between, with nothing</p> <p>Community structures must have “decision-making power” – legally (Poultney)</p> <p>Estimated financial needs (Poultney) to support floodplain management structure (R120000)</p> <p>Too much “I the undersigned...” (Bruwer)</p> <p>Institutional (government) illusion of control (Dent)</p> <p>No staff handover process (Arendse)</p> <p>Head Office / Regional office communications are not systematic (Arendse)</p> <p>Releases have to be approved by Head Office (DWAF), but factors that affect releases are not communicated to regional staff (Arendse)</p> <p>Management objectives for releases – “no claims” (Arendse)</p> <p>Political “swing” often dictates representative power – tribal / political dynamic often affects that “swing” (Arendse on POWADETA)</p> <p>No process for stakeholder “feedback” on releases (Arendse)</p>	<p>Currently no operating rules for the Pongolopoort Dam (Mwaka), those that do are not relevant because of changes in users and Moçambique.</p> <p>Emphasis on the technical rather than the social and cultural measures “because of historical approaches, and because it can be well defined and we are more skilled at it” (van Wyk <i>pers. comm.</i> 2002).</p> <p>Operating rules (yield, volumes etc) are hand-written paper on Clive Arendse’s desk (Arendse interview)</p> <p>Alignment of approaches across boundaries (van Wyk)</p> <p>No prioritisation of general principles.</p> <p>In SA, can’t implement Reserve because there is still confusion on classification methodology</p> <p>More integration of water users in management of water needed in management structure (Bruwer)</p> <p>Systems for communication of information relevant to particular person’s responsibilities is not systematically communicated (Arendse; van Wyk)</p> <p>Too few people on the floodplain have effective use of the Pongolopoort Dam (Mabika)</p> <p>There is negotiation, in release meetings, but large presence only when there’s a problem (Arendse)</p> <p>DWAF are concentrating considerable resources on developing a Sustainable</p>	<p>Current DWAF preference for September / October release is based on a need “to create volume (Mwaka) before the rainy season – nothing else.</p> <p>Lack of release regime and bad agricultural practice – reduction in biodiversity on the floodplain (Poultney)</p> <p>Lack of communication with “unrepresented” floodplain residents about agricultural development (Mabika)</p> <p>Co-operative governance is only a term, “everyone still keeps to his business” (Fick)</p>

	Transboundary structures	Institutional and management structures in the area of study	Water and natural resource management strategies in the area of study	
Current status	DWAF “do have a flood time in mind” (Arendse)		Utilisation Plan for the Water Users Association of private game farms around the dam! (Fick)	
			Need to look at Pongolo / Maputo – whole area – as system – not 3 different countries or game reserves & agriculture, but as a system so objectives can be formed & measured for the whole system (Poultney)	
Objective	Representative system across boundaries, which maintains the watercourse sustainably, and support development possibilities. Human rights water management.	Sustainability on the floodplain and maintenance of Futi wetlands (ecologically sensitive areas) and support for human activity. Leadership development (Dent)	Maintenance of the Reserve (in SA) and sufficient water for ecological health of the riparian system.	Maintenance of ecological functioning of the floodplain, Maputo Elephant Reserve and Ndumu to support human activity.
Constraints	<p>RMCC is an SDI programme, but SDI cannot be contacted.</p> <p>Reliance on the technical within water management, at international level concerns of the users – “democratically elected government” (van Wyk)</p> <p>SA attempted “not to influence the current state of affairs as far as water is concerned” in the TPTC (van Wyk)</p> <p>First decisions are on funding, not info requirements, which would then show what's already available and influence funding</p> <p>No system for info flow from TPTC to users & regional offices or other government departments</p> <p>No accepted definition of what is sustainable in the agreement or the TPTC – but IFR for ecological well-being</p> <p>Current monitoring is “top-down” – view that “scientific monitoring cannot be done by communities</p>	<p>No system for coordinating programmes by different government agencies in the same area in a structured way (national cross-cutting)</p> <p>New developments like Incomaputo – documentation is sent to regional offices, but it's at the discretion of the director what information is conveyed to their staff.</p> <p>No systematic way of disseminating implications of TBWRM agreements to the people on the ground within each riparian nation (certainly not in SA).</p> <p>Because of the lack of co-management – government thinks they're doing a good job, but stakeholders don't agree (Bruwer)</p> <p>Clearly defined roles and responsibilities of all parties in co-management</p> <p>Adequate representation of disadvantaged groups (Bruwer; Dent)</p> <p>Need to address political problems at the beginning – tribal authorities and municipal</p> <p>Dynamic environment needs an adaptive structure (Bruwer)</p> <p>Difficult to devolve power when the legal provisions (e.g. NWA) are not yet implementable e.g. Reserve. (Poultney; van Wyk)</p> <p>Once again, the “do what we've been doing” seems to prevail (Poultney)</p>	<p>Differing definitions of sustainability make setting objectives and monitoring very difficult</p> <p>Differing definitions of integration between EA and WA (Karodia)</p> <p>Licensing before CMAs will make it very difficult for CMAs to implement their objectives (Dent)</p> <p>Different structures in DWAF and Environmental Affairs makes formal synergy difficult (Karodia)</p> <p>Water and power interrelationship (hangover from apartheid days) makes a constraint to integration (Karodia)</p> <p>Lack of effective flow (& release) regime on the floodplain has resulted in a lack of development of the potential & degeneration in ecological processes on the floodplain (Karodia)</p> <p>Management is reactive or “crisis management” (Arendse)</p> <p>Lack of systematic management with defined roles, responsibilities and objectives agreed by all means that previous co-management efforts have depended on the person from</p>	<p>Differing definitions of integration between EA and WA (Karodia)</p> <p>Blurring of responsibilities between DEAT and Provincial EA (in KZN)</p> <p>Also – little interaction between Agriculture and EA (Provincial) (Karodia)</p> <p>Staff capacity in EA (KZN) good, but good staff are often lost to the private sector because of salaries in government (Karodia)</p> <p>National policies don't necessarily match provincial policies (Karodia)</p> <p>IDP process was fast-tracked and EA often didn't have a chance to comment (Karodia)</p> <p>Mindset is a constraint to better relations between Agriculture & EA – “old guard” issue (Karodia)</p> <p>Lack of familiarity (among department staff) with new legislation (Karodia)</p> <p>“The environment” is a section of the IDP and should be integrated at all levels (Karodia)</p> <p>No adequate “quantification” of detrimental effects of untimely releases on environment (but</p>

	Transboundary structures	Institutional and management structures in the area of study	Water and natural resource management strategies in the area of study	
Constraints		<p>Conservation needs a broader definition (& official conservation must approach it in a more integrated way)</p> <p>Stakeholder co-management, but also implementation of co-operative governance policy (Dent)</p> <p>Idea that the whole problem must be solved (thinking on a grand scale" (Dent)</p> <p>Government idea that if co-management systems have power, they'll lose control (Dent)</p> <p>Efficient management objectives can't be formed only by DWAF, but there's no formal communications between government departments about their activities on the floodplain (Arendse)</p> <p>Government staff at stakeholder meetings are not of sufficiently high level – therefore can only relay decisions, and can only relay stakeholder opinion – can't actually devolve any real power (Arendse)</p>	<p>DWAF who performs the liaison functions (Arendse; Bruwer; van Wyk; Dent; Mabika)</p> <p>Deep lack of trust between local people in SA and Moçambique and resentment over lack of releases for so long "because of Moçambique" (Mabika)</p>	<p>effects on cotton can be economically quantified) (Arendse)</p>
Imminent possibilities	<p>RMCC Communication structure could be extended – more contact between water & malaria issues (Sharp)</p> <p>Move to incorporate Environmental Affairs into TPTC</p> <p>TPTC to be converted into a River Basin Commission (van Wyk)</p>	<p>Possibility that this area (within SA) can be included as a case study in the Catchment Management Directorate, which will provide funding for establishing a co-management structure after the short-term programme by LWWP.</p> <p>More integration of "process and procedure" (Dent)</p>	<p>Short-term DWAF project in progress to identify stakeholders and users to communicate needs to DWAF for formation of new operating rules (Mwaka).</p> <p>Operating rules could form the basis of management objectives.</p> <p>Given correct guidelines for information to be provided to authorities, sufficient expertise exists on the floodplain (Mabika)</p>	<p>New structure of EA (including Vet Services) should improve communications between Agric. & EA (Karodia)</p> <p>"Old guard" who have "done it that way for so long, why change" are giving way to younger & new staff, so things are changing in terms of integration between the two Directorates</p> <p>KZN-EA attempting to improve environmental integration into the IDP process (Karodia)</p> <p>Better communication on specific projects, such as the Jolly Rubino, though that is informal, between WA & EA (Karodia)</p>

APPENDIX 4

BASIN-WIDE INTEGRATION ASSESSMENT

Appendix 4: Integrated basin-wide management assessment for the Pongolo River / Rio Maputo (Maputo Basin) according to the Incomaputo agreement

Category	Assessment	Details of assessment	Score	Maximum score
Integrated hydrographical basin management				
To determine the main obstacles to integrated hydrographical basin management and the promotion of the management / planning of hydrographical basin soil and water use and work to overcome these	Negligibly	Although agreement has been reached as to volumetric flows and allocations, no study has yet been performed or will be performed as regards soil use. The agricultural sector, conservation organisations and NGOs promoting environmental management have been excluded from this agreement	1	4
To develop consultative processes with the participation of the respective sectors and institutions in charge of water management, environmental protection and agriculture (at least) and a plan, at basin level, of water resource conservation, use and management	Negligibly	Integration cannot take place without the involvement of other sectors and the Incomaputo agreement has been negotiated entirely by the water sector	1	4
To include wetland conservation in basin management in order to strengthen the management (water supply, flood management, pollution mitigation and biological diversity)	Negligibly	Although there is a Ramsar site at Ndumu, and the Moçambican side of the border includes Futi wetland corridor, wetland conservation provisions do not appear in the Incomaputo agreement	1	4
To promote the protection and restoration of wetlands and their biodiversity within basins	Negligibly	For the reasons above	1	4
To develop well-conceived and socially acceptable mechanisms for cost sharing aimed at the distribution of the hydrographical basin management cost	Partly	Cost sharing mechanisms are in the process of being formulated in the TPTC, for a comprehensive basin study, but it is impossible to determine whether they are well-conceived or socially acceptable since the organisation does not publicise any information indicating in what manner and according to what factors, decisions were made	2	4
To promote the setting up of mechanisms designed to bring the groups involved together through basin management (governments, municipalities, water management bodies, teaching institutions, industries, farmers, local communities, NGOs etc) so that everybody participates in the management of the basin	Negligibly	At this stage, the agreement deals only with the Water Authorities in each riparian state, therefore participation is envisaged to take place only in terms of information gathering for the upcoming comprehensive basin study	1	4
To promote relevant public education and awareness programmes	Negligibly	Awareness of the agreement and the organisation is sparse, even within regional departments responsible for water management	1	4
Total Score			8	28

Category	Assessment	Details of assessment	Score	Maximum score
Development and strengthening of policies and legislation for integrated resource management				
To incorporate wetland management issues in existing water or hydrographical basin management policies and include water management issues in country policies	Partly	There is an ecological component to the water laws in both Moçambique and South Africa. South Africa is a contracting party to the Ramsar convention, but Moçambique is not.	2	4
To review the existing legislation and, as appropriate, develop new legislation to facilitate the implementation of key policy issues, such as the establishment of water councils and commissions; introduction of key incentives and deterrence measures; regulation of activities that could have harmful effects on water management	Considerably	South African and Moçambique water laws are both relatively new, and incorporate the principles of environmental management of riparian zones. New legislation is being developed in South Africa to effectively ratify the Ramsar Convention (Conservation of Biodiversity Act). It has not been possible to study Moçambican legislation to this degree, but the Incomaputo agreement suggests that there is a large degree of legislative similarity with regard to water management	3	4
To develop a water policy or a comprehensive basin management policy aimed at regulating the activities conducted in the basin and integrate wetland management in local plans	Negligibly	Although basin management policy incorporates the principles of sustainability and equity, activities considered remain specific to the water sector	1	4
To recognise that socio-economic development is often highly dependent on the protection of aquatic ecosystems, encourage different sectors to collaborate to allocate resources for the implementation of the policies and laws on integrated water resource management	Negligibly	Ecological requirements are recognised in the Incomaputo agreement, but social issues are largely ignored. Despite the principles of sustainability and equity, there is no explicit incorporation of socio-economic issues in the agreement.	1	4
To develop incentives for the promotion of water conservation and allocate water resources more effectively and equitably	Negligibly	Incentives for water conservation are left to the responsibility of the riparian states, and not covered in the agreement	1	4
Total Score			8	20
Setting up of hydrographical basin authorities and institutional capacity-building				
To set standards and objectives to be achieved and to determine the options and cost of the implementation of these objectives	Partly	Most standards required are technical and deal with water quality objectives or in-stream flow requirements	2	4
To ask joint authorities for basin management to prepare basin management plans	Considerably	Joint comprehensive basin studies are proposed for the Maputo basin as part of the agreement, but the issue of integration is not explicitly addressed	3	4

Category	Assessment	Details of assessment	Score	Maximum score
To develop mechanisms to facilitate resource transfer from beneficiaries downstream to the protection of upper watersheds and other regions of critical importance	Negligibly	This issue is not addressed at all in the Incomaputo agreement	1	4
The hydrographical basin management authorities should study, as necessary, the possibility of establishing cost-sharing formulas to collect the funds required for integrated basin management or request resources from the development aid community	Considerably	Cost-sharing is being discussed for the Maputo basin study within the TPTC at the moment	3	4
To provide training for water / wetlands managers to make them understand and apply the concepts of integrated management of water resources, river basins and wetlands	Negligibly	This issue is not addressed at all in the Incomaputo agreement	1	4
To provide adequate financial resources to ensure effective operation of the organisations in charge of water resources planning and resource management, hydrographical basin management and wetland and, when required, request resources from other sources	Negligibly	This issue is the responsibility of the state	1	4
To strengthen and sustain the capacities of the institutions to undertake comprehensive evaluations of the water demand, taking account of the ecological requirements	Partly	Agreed ecological requirements and allocations have been incorporated into the agreement, but the sources of these evaluations are not made public	2	4
To strengthen the protection of the upper basin and other critical regions of the hydrographical basin by integrating them in protected area networks	Negligibly	This issue is not addressed at all in the Incomaputo agreement	1	4
To promote the recruitment of staff with skills on wetland ecological functions from hydrographical basin management authorities	Negligibly	Wetlands are not explicitly addressed in the Incomaputo agreement.	1	4
Total Score			15	36
Evaluation and enhancement of the role of wetlands for water management processes				
The Scientific and Technical Evaluation Group (STEG) should collect information on biodiversity assessment methods so as to integrate these into wetland management and communicate the information to Parties for them to adapt these to the local context	Negligibly	The Incomaputo agreement deals mainly with water issues and the water sector. Other sectors have only been incorporated from the point of view of ecological flow requirements	1	4
To conduct studies to determine the functions of, and benefits drawn from wetlands as they concern water management in every hydrographical basin. With these results, the Parties should protect the remaining wetlands through prompt action when necessary	Negligibly	Not addressed in the Incomaputo agreement	1	4
To envisage the restoration of degraded wetlands and the creation of new wetlands within hydrographical basins	Negligibly	Not addressed in the Incomaputo agreement	1	4

Category	Assessment	Details of assessment	Score	Maximum score
To ensure the inclusion into watercourse management schemes, of non-structural flood management measures that build on the natural functions of the wetlands to complement or replace existing flood networks	Negligibly	Not addressed in the Incomaputo agreement. Also, there are no operating rules for the Pongolopoort Dam, so current flood networks are not performing suitably.	1	4
Total Score			4	16
Identification of the current and future water demand				
To evaluate current and future water resource supply and demand in a basin so as to meet the ecological and human needs and determine areas of shortage and possible conflict	Partly	Conflicts and disputes have not been envisaged at all, though the comprehensive basin study may improve that situation	2	4
To undertake evaluations to determine the economic and social costs in case the water requirements are not met	Negligibly	The agreement concentrates on water development projects and water utilisation projects, rather than integrated water management	1	4
To develop informed water demand management and pricing strategies that help sustain the functions and ecological values of water resources and wetlands	Negligibly	The agreement concentrates on water development projects and water utilisation projects, rather than integrated water management. A study of water supply and demand is envisaged for February 2009	1	4
To study encouraging measures and inappropriate incentives, plan the elimination of actions that lead to the depletion / degradation of wetlands; introduce or strengthen measures that encourage the restoration and sound use of wetlands	Negligibly	Wetlands are not explicitly covered in the Incomaputo agreement. While negotiations were taking place for the Incomaputo agreement, the regional office of DWAF in SA agreed a release volume with Moçambican authorities, from the Pongolopoort Dam. This issue is not addressed in the agreement.	1	4
Total Score			5	16
To mitigate the impacts of land development projects on wetlands and their diversity				
To develop integrated land occupation plans for each hydrographical basin	Negligibly	The agreement concentrates on water development projects and water utilisation projects, rather than integrated water management	1	4
To develop and implement adapted regulations for the control of activity sectors, in particular forestry, agriculture, mining and urban waste management	Partly	Agriculture and forestry are included, but only in terms of volumetric allocation and assurance of supply	2	4
To conduct Environmental Impacts Assessments (EIA) and Cost-Benefit Analyses (CBA) for projects and examine alternative solutions including the “do nothing” option	Partly	The EIA process is relatively well-developed in South Africa, not as well developed in Moçambique, but Cost-Benefit Analysis is in its infancy in water management, and is not explicitly mentioned in the Incomaputo agreement	2	4

Category	Assessment	Details of assessment	Score	Maximum score
To communicate the findings of any EIA or CBA in a form that is easily understandable	Partly	Information flow is agreed between the parties, but left to the parties to communicate information to water users in the basin. The agreement does not stipulate that information is to be communicated to the public, or users of the basin	2	4
To ensure that the relevant control and mitigation measures are taken to limit or repair the impacts when development projects are approved	Considerably	Any new project in the basin must include EIA, and transboundary impacts must be extensively defined	3	4
Total Score			10	20
Reduction of the impact of water development projects on wetlands				
To act in such a way that water development project proposals are carefully assessed from the beginning so as to determine whether non-structural alternative solutions could be envisaged or advised	Completely	This is a stipulation of the agreement	4	4
To take all necessary measures to mitigate the impact of water development projects on the biological diversity and socio-economic benefits during the construction and long-term operation of the infrastructure	Negligibly	The emphasis in the Incomaputo agreement is on water. Biodiversity and socio-economic benefits are not explicitly dealt with	1	4
To act in such a way that the project planning / design process includes a step-by-step process integrating environmental issues	Considerably	Planning processes for projects must include EIAs, though that is the only real mechanism within the agreement which integrates environmental issues	3	4
From the first steps of project preparation, integrate considerations on the long-term benefits and social costs in the process	Negligibly	Social issues are not covered in the agreement	1	4
Using this information to establish optimum discharge regimes to preserve wetlands	Negligibly	Wetlands are not explicitly covered in the agreement	1	4
When the available information on biological and physical parameters of the biotope is inadequate to reach a final decision on the required optimum discharge, use the precautionary principle	Considerably	The precautionary principle is stipulated in the agreement	3	4
Total Score			13	24
To develop sustainable water allocation plans for the various users of the resource in the hydrographical basin, not forgetting the allocation of water for wetland preservation				
To regulate and monitor the impacts of large-scale infrastructure building projects (embankments, roads, overflow channels and small dams) undertaken on a river and drainage channels	Considerably	Water development is one of the major considerations of the agreement, but sustainability is not adequately defined	3	4
Total Score			3	4

Category	Assessment	Details of assessment	Score	Maximum score
Protection and restoration of wetlands and their diversity				
To evaluate in each hydrographical basin, the state of wetlands and their biodiversity and take the necessary action to enhance preservation measures	Negligibly	Wetlands and biodiversity are not covered in the agreement	1	4
Parallel to the evaluation in each hydrographical basin of the state of wetlands; envisage the recording of key sites in the list of Wetlands of International Importance	Negligibly	Wetlands and biodiversity are not covered in the agreement	1	4
To ensure that the Ramsar sites management plans take into account possible impacts outside the sites and from inside the basin, as well as issues relating to the site itself	Negligibly	Wetlands and biodiversity are not covered in the agreement	1	4
To study and, if necessary, modify the biological conservation rules of wetlands in order to protect endangered species and protect the overexploitation of more prevalent ones	Negligibly	Wetlands and biodiversity are not covered in the agreement	1	4
Total Score			4	16

APPENDIX 5

COMMUNITY PARTICIPATION ASSESSMENT

Appendix 5: Assessing local and indigenous people's participation (IUCN 1999)

Category	Assessment	Details of assessment	Score	Maximum Score
INCENTIVES				
The local and indigenous people have found economic and other benefits in sound natural resource management of wetlands	Partly	Cash cropping on the floodplain itself has resulted from a lack of release management, and many farmers are growing cotton. There is little community benefit from the Ndumu Reserve. However, the floodplain residents recognise the need for a management system, mainly because the river and pan system is the only water source.	2	4
The government organisation has outlined the policies supporting participatory management	Negligibly	SA national water policy support participatory management through CMAs, but it has not yet been implemented. Since 1998, no participatory policy has been effectively outlined to the floodplain residents, but current projects (LWWP and the WRC/UNP projects) may change that.	1	4
Legal and financial incentives that are adapted to participatory management have been established	Negligibly	Legal provision exists for participatory management, but no incentives have been established. As yet, no financial incentives have been established for continuing participatory management.	1	4
More equitable sharing of benefits has resulted from the participatory management process	Partly	Between 1988 and 1996, a relatively equitable release regime through participation of the water committees was established, but it was dependent on the personality of the representative of DWAF (Mr Bruwer) for its success, since it broke down after he left the Department.	2	4
Stakeholders are satisfied with their participation in the process	Partly	Given the history of the water committees on the floodplain, there is some degree of satisfaction among stakeholders, but this has been eroded recently (since 1996). The new programmes being established on the floodplain have renewed stakeholders' interest and enthusiasm for participatory management.	2	4
Total Score			8	20
CONFIDENCE				
There is a policy or clear and widely known legislation facilitating the participation of local and indigenous people	Partly	The new NWA provides for the participation of the community in water management, as does the National Environmental Management Act. Because of the history of a degree of community participation in this area, and the workshop in October, it is relatively widely known. However, there is little integration, and active participation in real decision-making has been minimal	2	4

Category	Assessment	Details of assessment	Score	Maximum Score
All stakeholders, the government in particular, recognise participatory management as being legitimate and desirable	Extensively	There is recognition that participatory management is desirable, but there is little desire to integrate participation across government departments.	3	4
The local and indigenous people really participate in the decision-making process	Partly	Although meetings are held to inform stakeholders of decisions, and they have input to decisions, external forces (such as Moçambique) can remove all decision-making power from local stakeholders	1	4
Local organisations that support participatory management are respected	Completely	Although there is some dissonance between different local organisations, and some blurring of responsibilities across them, they are respected.	4	4
The representatives of the local people are really representative and accountable persons	Extensively	The structure of the water committees is does represent to a large extent, the different activities on the floodplain, but given that new activities have arisen, perhaps the structures should be changed to reflect them.	3	4
The resource use and participation rules fit into the local context	Partly	As yet, there are no rules, but general practice shows that stakeholders have a wide understanding of the local context, and structures exist to formulate such rules. Because of the lack of institutional support, unsustainable land-use practise has developed, but compromise is acceptable to local people through established community structures.	2	4
Stakeholders have concluded a management agreement (oral or written, formal or informal)	Partly	In the past, water committees worked successfully in terms of determining a stakeholder decision for release timing, but there is no management agreement as such.	2	4
The limits of the management agreement and parties to the agreement are clearly defined	Partly	Given the history of this area in terms of community participation in water management, and the fact that the population is relatively small, this could be achieved relatively easily.	2	4
The management agreement specifies the functions, rights and duties of the parties	Negligibly	There is no specific management agreement, and though some key people feature, there are no clearly defined roles.	1	4
The management agreement has been approved at least by the stakeholders using the resources and by the major decision-making groups	Extensively	Though there is no management agreement in place, there is widespread acceptance among stakeholders and decision-makers, that there should be and plans are presently being established to that effect.	3	4
Resource management rules appear to be applied	Negligibly	The floodplain is ecologically degenerated, but lack of "pressure" from high population or industrial activity is not a factor at the moment.	1	4
Total Score			24	44

Category	Assessment	Details of assessment	Score	Maximum Score
FLEXIBILITY				
The parties affected are able to collectively modify the rules of resource use	Extensively	Given the history of working together to modify the resource use rules, and the strength of the tribal system in the area, there is a strong probability that the community can collectively modify resource use rules, as long as there is institutional support for their decisions.	3	4
The local and indigenous people can evidently influence the pace and direction of changes depending on the resources that are of interest to them	Partly	They can, but again, this is dependent on institutional support, and also good representivity (some voices are not heard as yet).	2	4
Facilitators / coordinators apply the "learning by doing" method and adaptive management	Partly	For the most part, the community participation history shows this. There are also institutions in place such as the Makhatini Research Station which could assist in this area.	2	4
Total Score			7	12
EXCHANGING KNOWLEDGE AND BUILDING CAPACITY				
Awareness of stakeholders of the new management method can be ascertained	Extensively	There is a high level of stakeholder awareness of anything to do with water on the floodplain, and this would be relatively easy to achieve.	4	4
There is a flow of information and communication between the local and indigenous people and the relevant government organisations and vice versa	Extensively	Although such communication has not, to any large degree, influenced management decisions, communication systems are in place because of the necessity to warn the community in the event of a release. Release meetings are held, and there is also significant communication between both regional and national offices of DWAF. This does not extend to local government or the DAEA.	3	4
Information reaches the local people in a form that is easily understood	Extensively	Because of dam releases, this is in place and should only need adjustment as to the nature of the information supplied.	3	4
The local and indigenous people participate in continuous site surveillance and local ecological knowledge	Extensively	The people in this area have a long history of interaction with the environment, and should guidelines be provided by institutions as to what information is required, this is unlikely to present a problem in terms of adjustment as to the nature of the site surveillance.	3	4
Stakeholders have proven skills and the required responsibilities	Extensively	There is significant natural resource management expertise in the area, with the participation of KZN Wildlife, environmental consultants, and the local people's knowledge of the area and their history of working together to make water management decisions.	3	4

Category	Assessment	Details of assessment	Score	Maximum Score
The evaluation methods established by stakeholders serve to determine the level of participation expected and contribute to improving the wise use of wetlands	Negligibly	No effective evaluation methods have been determined – even the operating rules of the dam are not evident and require reformulation.	1	4
Total Score			17	24
CONTINUITY				
There is at least one organised structure that facilitates the participation of the local and indigenous people, for example, a council, a management body, a women's group etc.	Completely	The water committees, though they have diminished in effectiveness recently, could endure indefinitely with institutional financial support for administration costs	4	4
The government organisation and its staff have demonstrated their commitment to participatory management and can accurately describe the goal of local people's participation	Partly	Government departments are in the process of implementing more effective participatory management processes, but there is a lack of commitment as to their decision-making power, which institutions are reluctant to devolve in any meaningful way.	2	4
The local and indigenous people have provided support in kind (time, labour, traditional knowledge and expertise) for the implementation of the participatory management agreement	Extensively	The recent history of the water committees and the high attendance of local people at workshops and (often) release meetings demonstrate this.	3	4
There is integration between management of the wetland and management of the watershed	Negligibly	At this stage, there is none, despite a new water sharing agreement between Moçambique and SA, which covers this basin. Decision made in a management structure on the floodplain may therefore be ignored in favour of the provisions of the Incomaputo agreement.	1	4
Total Score			10	16

APPENDIX 6

QUESTION LIST FOR MOÇAMBIQUE WATER AFFAIRS (FRANCISCO ALVARO)

**Interview Questions for Francisco Alvaro
Moçambique Water Affairs liaison to TPTC, Joint-Liaison Committee (Moçambique / SA)**

General
Can you explain your position and responsibilities for the record?
Can you give me some idea of the institutional structure of Water Affairs in Moçambique? (Directorates, departments, provincial division, etc.?)
In her 2000 paper, "Gaps between the Un-Convention, the SADC Protocol and the new national water laws in South Africa, Swaziland and Moçambique", Joanne Leestemaker suggests that implementation of water law in Moçambique is largely taken care of by NGOs. Is that true?
What NGOs are involved? (The reason I ask is that the type of NGO is important from the point of view of environmental management and river sustainability.)
Are there any NGOs operating on the Rio Maputo? Who are they?
In the same paper, Leestemaker suggests that the requirements of large water users (like sugar and commercial farmers) and sectors such as Electricity (in the Incomati basin) dominate those of small subsistence users, and that there is little institutional and legislative support for them. What would be your response to this claim?
What institutional mechanisms for public participation (at a local level) are being practised in Moçambique (generally, and specifically as regards the Rio Maputo)? In other words, how would a local user gain knowledge and understanding of his rights with regard to water in Moçambique, and how would he go about receiving representation if he felt those rights were not being upheld?)
The Incomaputo Agreement
What are your responsibilities with regard to this agreement?
What is your (as a representative of the Moçambican government) perspective as regards the agreement? Do you feel that it will improve the situation where Moçambique has for so long, not received it's "fair share" of water as a downstream user?
Do communities and other government departments (at national, provincial and local levels) know about this agreement and have some idea of its provisions?
How were other government departments made aware of the Incomaputo agreement?
How do you feel this process could be improved?
How were communities on the relevant river basins made aware of this agreement?
How do you feel this process could be improved (given limitations of resources ant the rural nature of many of the communities)?
As recently as 1999, I believe there was a conflict over the required minimum flow on the Incomati River, where Moçambique threatened (not without reason) to take South Africa to the International Court of Justice and which resulted in Moçambique proposing changes to the SADC Protocol, which are now being ratified. Can you give me some background on that situation?
Do you feel that Incomaputo has resulted in an improvement?
How and why?
What is your response to the contention that development options in Moçambique have been stymied as a result of overuse of watercourses by upstream users?
To what extent do you think that statement is true and how do you think the Incomaputo agreement has affected that situation?
As regards the TPTC, I have noticed from minutes provided by Niel van Wyk, that representatives from Moçambique to the TPTC are all from Moçambique Water Affairs Departments. What representation does the Environmental Affairs, Agriculture or other government departments have in the TPTC?
If not specifically in the TPTC, by what mechanisms do other departments communicate with water affairs as

regards decisions taken on water issues, that may affect their plans, strategies or operations in the southern Maputo province (around the Rio Maputo)?
The Rio Maputo and Pongolopoort Dam
DWAF in South Africa reports that Moçambique has refused releases from Pongolopoort Dam of greater than $85\text{m}^3\text{s}^{-1}$ since September 2000. Is that true, and if so, why?
Two programmes, one short-term and one relatively long-term have recently been established on the Pongolo River floodplain, for stakeholder co-management of releases from the dam. How do you feel that stakeholders in Moçambique could also participate in that arrangement?
If so, on what basis do you think such a structure would integrate with the TPTC?
DO you think that there is scope within the TPTC for such participation at local level?
The Medical Research Council is currently conducting (along with the Departments of Health in SA and Moçambique, "Community-driven malaria control programme" in the area through which the Maputo flows. Their community communication structures are excellent (according to the Director of the programme). Do you think this offers an opportunity for water management in the area as well, and in what way?
With regard to an annual flood release from the Pongolopoort Dam, the regional Water Affairs representative responsible for releases said in a recent interview that his perception was that Moçambique did not want any water. Is that the case? If so, why? If not, what are Moçambique's objectives as regards releases from Pongolopoort?
Do you have any development plans for the Rio Maputo and what are they?
Are there any other comments you wish to make?