

FANRPAN
Food, Agriculture and Natural Resources Policy Analysis Network



Limpopo River Basin Focal Project

Framework and Guide to Review of Policy and Institutional Literature

Working Draft by Douglas J. Merrey and the Limpopo Basin Focal Project Team,
FANRPAN

1 July 2008

Submitted to CPWF as Milestone 6.



Limpopo Basin Focal Project
Framework and Guide to Review of Policy and Institutional Literature
Douglas J. Merrey and the Limpopo Basin Focal Project Team

Purpose and Structure of this Paper

This paper is intended to provide a framework and guide for the review of policy and institutional literature relevant to understanding the issues and opportunities for future development of the Limpopo River Basin. The actual literature review will be carried out during the first year of the Limpopo Basin Focal Project, and will be supplemented with key informant interviews. The report on the results of this review will be a key milestone for the Work Package entitled “Institutional Analysis.” Another purpose of the paper is to provide an initial working list of references, which will be expanded and made available as part of the report.

Conceptual Framework

Our working definitions of key terms used in this paper are fairly standard in the literature, but are here based on those in Merrey et al. 2007: Box 1. They are as follows:

‘Institution’ refers to all social arrangements that in some way or another shape and regulate human behavior, and have some degree of permanency and purpose transcending individual human lives and intentions. Examples are rotation schedules for water distribution; market mechanisms for obtaining crop credit; membership rules of water users associations; and property rights in water and infrastructure. Institutions are often referred to as the ‘rules of the game’ in society (North 1990). There often is a plurality of rules relevant to a given situation, rules are interpreted and acted upon differently by different people, and institutions, including rules, are dynamic and emerge, evolve and disappear over time.

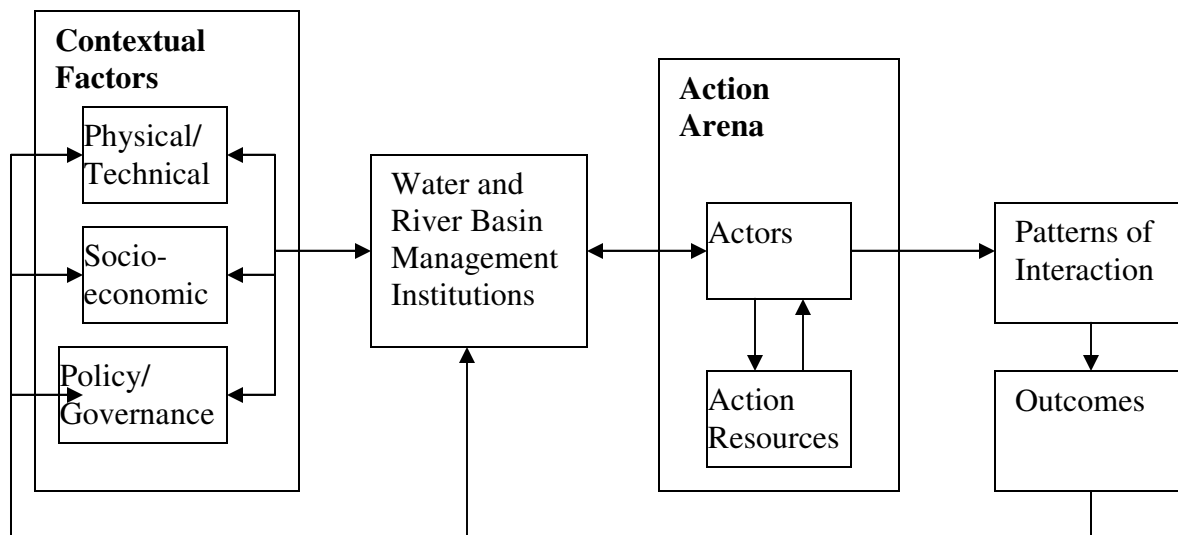
‘Organizations’ are groups of people with one or more shared goals and some formalized pattern of interaction, often defined in terms of “roles” such as president, water bailiff, or secretary. Examples are water users’ associations; irrigation agencies as government departments, parastatal bodies, or privatized companies; water resources research organizations; farmers’ unions; consultancy firms; NGOs; and regulatory bodies. There is enormous diversity in the form, scope, size, structure, permanency and purpose of organizations. Bureaucracies are a particular type of organization characterized by such attributes as role differentiation, hierarchical relationships among roles, and formal, written, rules of procedure and accountability. This makes them very different from less formal local associations—but both are ‘organizations’ by definition.

A **‘policy’** is ‘a set of interrelated decisions taken by a political actor or group concerning the selection of goals and the means of achieving them within a specified situation where these decisions should, in principle, be within the power of those actors to achieve’ (Howlett and Ramesh 1995:5, quoting Jenkins, 1978). Any organization can have policies, but the focus here is on public policy.

‘Governance’ is a widely used term, often with a normative statement of the necessity of ‘good governance’ attached. The Global Water Partnership (Rogers and Hall, 2003) uses the following definition: ‘Water governance refers to the range of political, social, economic and administrative systems that are in place to develop and manage water resources, and the delivery of water services, at different level of society’. Governance is therefore a broad term that includes institutions, organizations and policies. The World Bank broadens the definition to include the process by which those in authority are selected, monitored and replaced, and the effectiveness of government in implementing sound policies. (World Bank, www.worldbank.org, accessed 01/06/05).

Our *working hypothesis* is that the policy and institutional frameworks and environment largely determine the outcomes of technical innovations. But ‘technology’ and ‘institutions’ are systematically integrated into “socio-technical” systems, and analysis of one dimension must be integrated with the analysis of the other. Technologies do not exist in a vacuum—but neither do institutions, organizations or policies. Therefore, the Limpopo Basin institutional analysis will take a broad, integrated approach, as illustrated in Figure 1. Figure 1 shows the interactions among contextual factors (physical/technical, socio-economic, policy) and what actors do, mediated by the institutional framework. Several of the Project Work Packages are consistent with the ‘contextual factors.’ But note the feedback loops: policies and governance are embedded in an institutional framework, and socio-economic and even technical dimensions are heavily influenced by this framework itself. All these dimensions provide the constraints and incentives for actors (people) to choose to behave in certain ways, leading to patterned outcomes. These outcomes themselves feed back to the institutional framework, policies, socio-economics, and so on.

Figure 1 Modified Institutional Analysis and Development Framework



Source: Modified from Ostrom 2005, in Merrey et al. 2007.

A dimension that is missing in Figure 1 is *history and culture*. The historical experiences of the various ethnic groups and nation states sharing the Limpopo Basin have had profound impacts on values, perceptions, customs, social structures, economies, policies and institutions. Mozambique's colonial experience was radically different from the historical experiences of Botswana; and the values, perceptions, life experiences and so on of the different ethnic groups (regardless of race) in the basin are also profoundly different. We cannot understand the policies and institutions at any level unless we keep the histories and cultures of the actors in perspective.

In assessing opportunities in river basins shared by several countries (or indeed other political entities in a federal state), a crucial distinction has been proposed between sharing water in the basin, and "benefit sharing" (Sadoff et al. 2002; Turton forthcoming, 2008). The traditional approach is for political entities to focus on "equitable" sharing of water flows, then each country develops its allocated water source. This often leads to sub-optimum outcomes compared to the potential. An approach based on benefit-sharing enables the political entities to treat the entire basin as a unit and ask what kinds of investments would generate the greatest overall benefits, and then negotiate and potentially agree on how the costs and benefit flows will be shared. Finally, the paper aims explicitly to support the 'best bet' agricultural water management intervention packages emerging from Work Package 5 and others.

Institutional Levels

There are numerous small communities residing in the Limpopo River Basin, each having unique characteristics, problems and opportunities, but with important shared features and different levels of mutual dependency as well. Communities are generally part of a system of local government, which in turn is a level within a nation state. Each of the four basin countries has its own national governmental policies and institutions. South Africa has legal provisions for catchment management agencies for the four "Water Management Areas" that constitute its portion of the Limpopo Basin, though none have been established as yet. Zimbabwe has made more progress establishing catchment and sub-catchment councils, while Mozambique has a parastatal regional water management organization.

At the transboundary basin level, there is a Limpopo Watercourse Technical Committee, and the riparian countries are in the process of establishing a more authoritative Limpopo Basin Commission (LIMCOM). As this develops capacity and achieves greater legitimacy, it will play an increasingly important role in river basin management. Finally, the four riparian countries are members of the Southern African Development Community (SADC). The SADC member states have adopted a Protocol on Shared Watercourses, and have also initiated regional level strategies, policies, and agreements for joint infrastructural development.

There are also numerous other types of organizations either directly active in the basin, or having indirect but critical impacts on the basin. These include donors and development banks, community based organizations, NGOs, small, medium, and large private firms, traders and tourists—the list can become quite long. Some of these institutions will be included in the planned stakeholder inventory but may not receive much attention in our review, except where directly relevant to potential water management interventions.

Our analysis of policies and institutions therefore must be based on these multiple levels, while also recognizing the interactions, linkages and in some cases interdependencies among them. We propose to pay attention to gender issues as much as possible, but expect to find the literature to be rather limited on this dimension.

We therefore propose to structure the literature review as follows:

Tentative title: **Opportunities for Innovation: Institutional and Policy Analysis of the Limpopo River Basin, Southern Africa**

Introduction

Purpose

Conceptual Framework

Institutional Levels

Historical Perspectives

The Regional Context: SADC and its Development Partners

The Limpopo Basin—Transboundary Institutions and policies

National and Local Government Policies and Institutions

Botswana

Mozambique

South Africa

Zimbabwe

Local Communities

Summary: Emerging Opportunities for Innovation

Summary: Gaps in Knowledge for Further Research

List of References

This structure may be adjusted as we proceed. The following sections briefly characterize the topics to be covered and some of the sources of information.

Historical Perspectives

Earle et al. (2006) provide an historical overview of the pre-colonial, colonial, post-colonial, and “post cold war” history of the basin, with an emphasis on indigenous natural resources governance and how these have changed over time. A summary of the major historical events and trends in the basin is provided in Appendix 1, taken from Earle et al. (2006). Turton et al. (2004) describe the “hydropolitical” history of South Africa with an emphasis on the 19th-20th centuries, while van Koppen (2008) analyzes the Olifants basin trajectory (see also Merrey et al., forthcoming 2008). A gap currently is an historical perspective on developments in Mozambique; we will try to fill this with assistance from the Mozambique partners in the project.

For the purpose of the LBFP, this section of the analysis will focus on selected key events that are directly relevant in terms of assessing opportunities for policy and institutional

innovations, and institutional support for technical innovations, aimed at reducing poverty and enhancing livelihoods through agricultural water management.

The Regional Context: SADC and its Development Partners

Over the past decade, SADC with support from its development partners has been laying the groundwork for optimizing regional partnerships in management of its water resources. This is important because all of the major rivers in the region are shared between two or more countries. At the highest political levels, the SADC member countries have been developing and articulating through treaties and declarations a common vision of the future, and within this context, adopted the “Southern African Water Vision” in March 2000 at The Hague Water Forum. The “Revised SADC Protocol on Shared Watercourses,” which entered into force in September 2003, sets out principles to foster closer cooperation in developing, using and conserving shared water courses while advancing the regional agenda for integration and poverty reduction. Some of the key documents include: the Revised SADC Protocol on Shared Watercourses; SADC Regional Water Policy (SADC no date); SADC Regional Strategic Action Plan on Integrated Water Resources Development and Management (SADC 2005); SADC Regional Water Strategy (SADC 2007); and the report on a seminar on “Major Water Infrastructure Development in Africa” (InWent 2007a, b). In addition there are academic papers, and papers presented by some of the key SADC actors in the process of the past decade (e.g., Turton and Henwood, eds. 2002; Turton et al., eds. 2003; Ramoeli 2002). More recently, Earle et al. (2008) assessed the capacity of SADC regional and national institutions to strengthen integrity and accountability.

For the purpose of this paper, we propose to do a critical and selective review of key documents and literature—a full assessment would be a project in itself. We propose to combine this with interviewing key informants in southern Africa including but not only officials at SADC, SADC’s development partners, and officials from the four basin countries. The focus will be on understanding how the agreed policies, strategies and institutional frameworks will enhance cooperation on the Limpopo basin, including the extent to which a ‘benefit-sharing’ perspective is central (it is certainly present in the texts). This may also be the best opportunity to identify gender issues and opportunities at the regional level. A key theme will be the capacity to support water management interventions that help reduce poverty in the Limpopo Basin.

The Limpopo Basin: Transboundary Institutions and Policies

Turton (2003) summarizes Limpopo basin transboundary institutional development, placing it firmly in the context of the hydropolitical development of South Africa. Turton et al. (2004: chapter 6) provide a history of the development of water infrastructure by South Africa in the Limpopo Basin. These are good starting points for an analysis, but are written from a South African perspective; they also need to be updated, as there are more recent developments. The major current institution created by the four riparian countries for the Basin is the Limpopo Basin Permanent Technical Committee (LBPTC). The LBPTC was established in 1986 by the four riparian countries, largely to manage water shortages. In recent years, this Committee has worked reasonably well in terms of producing reports, sharing some data and establishing better communication; but Turton (2003:218) claims it has never functioned well and “has been dysfunctional from its

inception, with the prognosis for success being poor....” (*ibid.*: 226). This judgment may prove too harsh, because more recently (2003), the four countries agreed to replace it with the Limpopo Water Course Commission (LIMCOM), a higher level institution that will enable the countries to work together more effectively for “joint utilization” of this important water-stressed shared basin (DWAF 2004:18). Nevertheless, LIMCOM has yet to be ratified by the four countries (UN-HABITAT & UNEP 2007:13) – possibly an indication of political sensitivities. South Africa and Mozambique have a separate Joint Water Commission where management of the Olifants Basin, among other shared issues, is addressed (Basson and Rossouw 2003; DWAF 2004). However, there is no agreement specifying transboundary flow requirements (McCartney et al. 2004; Basson and Rossouw 2003). In fact, Turton (2003:223ff) emphasizes that Limpopo hydrological data are contested, with each country offering a version that suits its own aspirations. A critical historical factor is the continuing impact of relations that developed between South Africa and Mozambique and Zimbabwe during the liberation struggles. Wolf et al. (2003) classify the Limpopo—along with all the other major Southern African shared river basins—as a “basin at risk” for future conflict over water.

We are in the process of establishing linkages to LIMCOM (or technically, LBPTC), and plan to interview its members, and *possibly* even past members. We will also interview its development partners and review any documents that may be available—we are aware that it has either commissioned or endorsed a number of studies. A possible impediment to the CPWF developing an effective working relationship at this level is a history of false starts, i.e., donor-supported work that identified a plan of action that was then not supported by the development partners (e.g., UN-HABITAT & UNEP 2007). We also note that the LBFP will seek to achieve some degree of agreement on basin data (and identify specific areas needing further attention from a transboundary perspective).

National and Local Government Institutions and Policies

There is a great deal of literature on water policy and legal reforms in South Africa and Zimbabwe, both of which adopted comprehensive new water laws in 1998. Researchers in Zimbabwe have been studying the Catchment Councils and sub-catchment councils and reporting on these at, for example, annual Waternet Symposiums. IWMI and the Water Research Commission among others have supported research on experiences implementing the National Water Act; IWMI’s work has focused largely on the Olifants (see Merrey et al., forthcoming 2008 for an overview). The University of Pretoria has also published research on South African policy and institutional reforms, often with reference to the Limpopo Basin. South Africa has not as yet initiated Catchment Management Agencies (CMAs) on any of the four “Water Management Areas” constituting its portion of the Limpopo River Basin, though this could change during the project period¹. The Department of Water Affairs and Forestry (DWAF) is responsible for water resources management in South Africa, while Zimbabwe has created the Zimbabwe National Water Authority (ZINWA) to coordinate regional water authorities and the national Department of Water Resources. ZINWA works closely with the Catchment Councils.

¹ Wester et al. 2003 assess issues that arose during the process of developing a CMA proposal for the Olifants; the proposal was never submitted to the Minister. See Merrey et al., forthcoming 2008.

Mozambique has also been reforming its institutions, for example creating regional river basin authorities (ARA-SUL for southern Mozambique including the Limpopo basin); there may be some literature in Portuguese but not much. The National Directorate for Water (DNA) is the key responsible agency, but there is also an inter-ministerial National Water Commission (CNA) (UN-HABITAT & UNEP 2007:13). A case study produced by the Transboundary Institutions Project (Anonymous no date) provides some further information. Recently, Earle et al. (2008:15-18) have provided a summary of the Mozambique water institutional landscape.

We have not yet found much literature from Botswana, though it does exist (e.g., the recent summary by Earle et al. [2008:8-11]). Like the other countries, Botswana has a National Water Policy and Water Act based on IWRM principles (UN-HABITAT & UNEP 2007:13). The Department of Water Affairs is the key water management department. In all the basin countries, local governments play critical roles, for example providing local water supply services. The EC supported a project on “Local Governments and Integrated Water Resources Management in Southern Africa” that focused on the Limpopo Basin; some materials have been produced by that project, which ended in 2007 (<http://www.iclei-europe.org/index.php?id=1540>). A major common issue is the need to strengthen the financial and institutional capacity of local governments, which are often struggling to meet the demands of their constituents.

We will draw on and synthesize key findings from the large body of literature on national water policies and institutions, and try to fill gaps in those countries where fewer studies have been done through interviews and analysis of documents. We expect to find that knowledge of institutional and policy reform and implementation is a gap in the existing literature. At local government level, we will draw on what research has been done, contact the project mentioned above for further information, and selectively interview key informants from local governments in the four countries. We again anticipate that gender issues will be a gap in knowledge; and capacity to implement interventions at a large scale will be shown as limited.

Local Communities

There is a substantial literature on local-level institutional arrangements, especially in South Africa and Zimbabwe. Some of this literature has been contributed by Challenge Program-supported projects (MUS, Wetlands, African Transboundary Institutions), others by IWMI and the Universities of Pretoria and Limpopo, PLAAS (e.g., Tapela 2005; 2008), etc. There are case studies on local customary water governance for each of the four countries produced by the Transboundary Institutions Project (Manzungu et al. no dateA; Goldin no date; Manzungu et al. no dateB; Anonymous no date). The MUS project has produced local level studies on South Africa and Zimbabwe addressing the institutional framework for multiple use water supply systems (<http://www.musproject.net/page/397>). There are likely to be case studies for Mozambique (probably in Portuguese) and Botswana, but we have yet to find them. Tinguery (2006), with support from the CPWF project on wetlands, has assessed the interface between local community-based resources management and the formal laws, policies and institutions related to wetlands.

There is also a growing literature on the problems facing small-scale irrigation schemes, especially in South Africa and Zimbabwe. Shah et al. (2002) reviews some of this literature; other sources include Kamara et al. 2002, Machethe et al. 2004, Uiterweer et al. 2006, and Hope et al. 2008 who question the usefulness of small scale communal irrigation for poverty reduction. Faysse (2004) assesses experiences with transforming South Africa Irrigation Boards into Water Users Associations under the National Water Act of 1998.

Attempting a full review of all these local-level studies is beyond the resources and mandate of the project. Therefore, we will focus on experiences with interventions and innovations, outcomes of particular institutional arrangements or management practices, and characteristics of the communities that might make them candidates for future interventions. We have a few students interested in doing research in local communities (For example gender issues in a small scale irrigation scheme)—we will support them to focus on experiences or issues that will contribute to identifying interventions and innovations (or evaluating experiences with interventions). Rapid appraisals and opportunistic focus group discussions in the course of field visits will contribute as well. The studies at this local level will also contribute directly to the water and poverty work and possibly water availability and access packages; and will be critical to assessing the feasibility of intervention packages at local level.

Summary: Emerging Opportunities for Innovation

This section will be derived from the results reported in the previous sections. It will be organized around the categories of water management interventions used in the Limpopo interventions matrix—technical, infrastructure, policies, and institutions. Examples of institutional interventions include Catchment Management Agencies/Councils; Catchment Management Forums, and Water Users Associations. But technical and infrastructure interventions will only succeed in a supportive policy and institutional framework.

Summary: Gaps in Knowledge for Further Research

This section will be based on results reported in the previous sections. We anticipate that gender dimensions of institutional arrangements at all levels will prove a major gap in knowledge. Another likely gap is in-depth political-economic analysis of policy and institutional reform implementation processes, identifying the vested interests and behind-the-scenes processes that affect the outcomes of any reform process.

List of References

- Anonymous. No date. Mozambique Case Study. African Models of Transboundary Water Resources Governance. Unpublished.
- Basson, M.S., and J.D. Rossouw 2003. Olifants Water Management Area: Overview of Water Resources Availability and Utilization. DWAF Report No. P WMA 04/000/00/0203. Final issue, September 2003. Pretoria: DWAF Directorate of Water Resources Planning and BKS (Pty) Ltd.

- DWAF. 2004. Olifants Water Management Area: Internal Strategic Perspective. Prepared by GMKS, Tlou and Matji on behalf of the Directorate, Water Resources Planning. DWAF Report No. P WMA 04/000/00/0304 Pretoria: DWAF.
- Earle, Anton, Jaqui Goldin, Rose Machiridza, Daniel Malzbender, Emmanuel Manzungu, and Tiego Mpho. 2006. Indigenous and Institutional Profile: Limpopo River Basin. IWMI Working Paper 112. Colombo: IWMI.
- Earle, Anton, Goodwell Lungu, and Daniel Malzbender. 2008. Mapping of Integrity and Accountability in Water Activities and Relevant Capacities in the SADC-Region. Report commissioned by UNDP Water Governance Facility. Stockholm: SIWI, WaterNet, and Cap-Net. April.
- Faysse, Nicolas. 2004. An Assessment of Small-scale Users' Inclusion in Large-scale Water Users Associations of South Africa. IWMI Research Report 84. Colombo: IWMI.
- Goldin, J. No date. Case Study of Customary and Traditional Water Governance in South Africa. CP 47: African Models of Transboundary Governance. Unpublished.
- Hope, R.A., Gowing, J.W., Jewitt, G.P.W. 2008. The contested future of irrigation in African rural livelihoods – analysis from a water scarce catchment in South Africa. *Water Policy* 10: 173-192.
- Howlett, M., and M. Ramesh. 1995. *Studying Public Policy: Policy Cycles and Policy Subsystems*. Oxford, UK: Oxford University Press.
- InWent. 2007a. Major Water Infrastructure Development in Africa: Balancing economic, environmental and social aspects for sustainable incomes. Regional East and Southern Africa seminar convened by SADC, EAC, AMCOW-TAC & NEPAD supported by InWent, UNEP, GTZ, and GWP.
- InWent. 2007b. The 6th Petersberg Round Table on Transboundary Water Management in Africa: “From agreements to investments – How to put measurable value to transboundary water management in Africa.” Key Findings.
- Jenkins, W. I. 1978. *Policy Analysis: A Political and Organizational Perspective*. London: Martin Robertson.
- Kamara, A. B.; Van Koppen, B.; Magingxa, L. 2002. Economic viability of small-scale irrigation systems in the context of state withdrawal: The Arabie Scheme in the Northern Province of South Africa. *Physics and Chemistry of the Earth* 27:815-823.
- Machethe, C.L., Mollel, N.M., Ayisi, K., Mashotala, M.B., Anin, D.D.K., Vanasche, F. 2004. Smallholder Irrigation and Agricultural Development in the Olifants River Basin of Limpopo Province: Management Transfer, Productivity, Profitability and Food Security Issues. WRC Report No. 1050/1/04. Pretoria, South Africa: Water Research Commission.
- Manzungu, E., T. Mpho, A. M. Mudanga, & T. S. Lekoko. No dateA. Case Study of Customary and Traditional Water Governance in Botswana. CP 47: African Models of Transboundary Governance. Ed. A. Sullivan. Unpublished.

- Manzungu, E., T. Mukamba, & A. Nyamwanza. No date. B. Case Study of Customary and Traditional Water Governance in Zimbabwe. CP 47: African Models of Transboundary Governance. Ed. A. Sullivan. Unpublished.
- McCartney, Matthew Peter; Yawson, Daniel. K.; Magagula, Thulani F.; Seshoka, Jetrick. 2004. Hydrology and water resources development in the Olifants River Catchment. Colombo, Sri Lanka: IWMI. IWMI Working Paper No. 76). Colombo: IWMI.
- Merrey, D. J., Meinzen-Dick, R., Molinga, P., and Karar, E. 2007. Policy and Institutional Reform: The Art of the Possible. Chapter 5 in: D. Molden, ed., *Water for Food, Water for Life: The Comprehensive Assessment of Water Management in Agriculture*. Earthscan, UK. Pp.193-232.
- Merrey, D.J., H. Léville, and B. van Koppen. Forthcoming, 2008. Are Good Intentions Leading to Good Outcomes? Continuities in Social, Economic and Hydro-political Trajectories in the Olifants River Basin, South Africa. F. Molle and P. Wester, eds. *Historical Trajectories of River Basins: A Perspective on the Human-Environment Nexus*. CABI.
- North, D. 1990. *Institutions, Institutional Change, and Economic Performance*. Cambridge, UK: Cambridge University Press.
- Ostrom, E. 2005. *Understanding Institutional Diversity*. Princeton, N.J.: Princeton University Press.
- Ramoeli, Phera. 2002. The SADC Shared Protocol on Water Resources: Its Origins and Current Status. In: Anthony Turton and Roland Henwood, eds., *Hydropolitics in the Developing World: A Southern African Perspective*. Pretoria: AWIRU, Centre for International Political Studies, University of Pretoria (CD-ROM version produced by IWMI).
- Rogers, P., and A. Hall. 2003. "Effective Water Governance." GWP Technical Committee Background Paper 7. Global Water Partnership, Stockholm.
- Sadoff, Claudia W., Dale Whittington, and David Grey. 2002. *Africa's International Rivers: An International Perspective*. Washington, D.C.: World Bank.
- SADC. 2005. *Regional Strategic Action Plan on Integrated Water Resources Development and Management*.
- SADC. 2007. *Regional Water Strategy*.
- SADC. No date. *Regional Water Policy*.
- Shah, T., Barbara van Koppen, Douglas Merrey, Marna de Lange, and Madar Samad. 2002. *Institutional Alternatives in African Smallholder Irrigation: Lessons from International Experience with Irrigation Management Transfer*. IWMI Research Report No 60. Colombo: IWMI.
- Tapela, Barbara Nompumelelo. 2005. *Joint Ventures and Livelihoods in Emerging Small-Scale Irrigation Schemes in Greater Sekhukhune District: Perspectives from Hereford*. Programme for Land and Agrarian Studies Research Report No. 21, School of Government, Western Cape.

- Tapela, B.N. 2008. Livelihoods in the wake of agricultural commercialization in South Africa's poverty nodes: Insights from small-scale irrigation schemes in Limpopo Province. *Development Southern Africa* 25(2):181-198.
- Tinguy, N. 2006. The Interface Between the Local Community-Based Wetland Resources Management and the Formal Wetland Policies, Laws and Institutions. Unpublished Final Draft, February. IWMI and Brandeis University.
- Turton, A. & R. Henwood, eds. 2002. *Hydropolitics in the Developing World: A Southern African Perspective*. Pretoria, South Africa: African Water Issues Research Unit, Centre for International Political Studies, University of Pretoria (CD produced with permission by IWMI).
- Turton, Anthony, Peter Ashton and Eugene Cloete, eds. 2003. *Transboundary Rivers, Sovereignty and Development: Hydropolitical drivers in the Okavango River Basin*. Pretoria: AWIRU and Green Cross.
- Turton, A.R., R. Meissner, P.M. Mampane, and O. Seremo. 2004. *A Hydropolitical History of South Africa's International River Basins*. WRC Report No. 1220/1/04. Pretoria: Water Research Commission.
- Turton, Anthony Richard. 2003. *The Political Aspects of Institutional Developments in the Water Sector: South Africa and Its International River Basins*. Unpublished Ph.D. Thesis. Pretoria: University of Pretoria, 31 May 2003.
- Turton, A.R. Forthcoming, 2008. Reflections from South Africa on a Possible Benefit-Sharing Paradigm for Trans-boundary Waters. Forthcoming in *International Journal of Water Resources Management*. Presented at First Africa Water Week, Tunis, Tunisia, 26-28 March 2008.
- Uiterweer, Nynke C. Post, Margreet Z. Zwarteveen, Gert Jan Veldwisch, and Barbara van Koppen. 2006. Redressing Inequities through Domestic Water Supply: A 'Poor' Example from Sekhukhune, South Africa. In: Sylvain Perret, Stefano Farolfi, and Rashid Hassan, eds., *Water Governance for Sustainable Development: Approaches and Lessons from Developing and Transitional Economies*. London: Earthscan. Pp. 54-74.
- UN-HABITAT and UNEP. 2007. *Limpopo Basin Strategic Plan for Reducing Vulnerability to Floods and Droughts*. Draft for discussion with Riparian Governments. Maputo: UN-HABITAT.
- van Koppen, Barbara. Forthcoming, 2008. Redressing Inequities from the Past in South Africa: The Case of the Olifants Water Management Area. Unpublished draft accepted for publication as an IWMI Research Report.
- Wester, P., Merrey, D.J., and de Lange, M. 2003. Boundaries of consent: Stakeholder representation in river basin management in Mexico and South Africa. *World Development* 31 (5):797-812.
- Wolf, Aaron T., Shira B. Yoffe, and Mark Giordano. 2003. International Waters: Identifying Basins at Risk. *Water Policy* 5: 29-60.

Appendices

APPENDIX ONE: Overview of major historical events and trends in the Limpopo Basin

Source: Earle et al. 2006: Appendix 1

<i>Time period</i>	Botswana	Mozambique	South Africa	Zimbabwe
Pre-colonial		<i>Up to 1880s</i>	<i>Up to 19th century</i>	<i>Up to 1890</i>
	<p>-Part of present day Botswana formed part of the Great Zimbabwe state</p> <p>-Evidence of farming among the Sotho; eastern Botswana inhabited by a Sotho subgroup with prowess in cattle rearing and hunting for domestic and livestock watering</p>	<p>-Zimbabwe culture extends into present-day southern Mozambique</p> <p>-Portuguese traders arrive in the 15th century but their activities remain limited to the coastal regions</p>	<p>-Bantu-speaking settlers (Zimbabwe culture) in the Mapungubwe region, remains dating back to between AD 350 and 450</p> <p>-Mapungubwe is main settlement of Zimbabwe culture from AD 1220 to 1290 before centre moves to, Great Zimbabwe (AD 1290 to 1450) and Khami near present day Bulawayo (AD 1450 to 1820).</p> <p>-Evidence of agricultural production in conjunction with other economic activities such as cattle raising and trade.</p> <p>-Arrival of first European settlers in 1652 and subsequent expansion of European settlements</p>	<p>-Existence of a vibrant pre-colonial Zimbabwean culture at Mapungubwe that later spread north and west</p> <p>-Evidence of farming communities in conjunction with other economic activities such as trade</p> <p>-Settlers enter the country</p>

Colonial

	<i>1880s to 1975</i>	<i>19th century - 1961</i>	<i>1890 – 1980</i>
-Proclaimed a British Protectorate in 1885, a move opposed by some of the traditional leaders	-Portuguese colonial rule intensifies	-Increased presence of European settlers in Limpopo basin area	-Settlers emphasis on water for agriculture instead of mining
-Drilling of boreholes by colonial state, private drilling was also allowed	-Establishment of formal administrative hierarchy of the Portuguese colonial empire in 1934 by the “Reforma Administrativa Ultramarina (RAU)” - establishment of “regulados”	-Establishment of ZAR	-Centralization of water resource management by the colonial state as evidenced by the Water Ordinance (1913) and Water Acts (1927 and 1976)
	-natural resource use is governed by formal state legislation, but enforcement is weak - parallel existence of customary water management regimes likely	-Increased regulation of the role of traditional leaders by British colonial government – indirect rule (later also adopted in the ZAR)	-Erosion of indigenous irrigation through legal means e.g. the Natural Resources Act
		-Agriculture becomes more commercialized, irrigation becomes primary water user	-Settlers enjoy better water and other rights than indigenous people
		-Water legislation primarily directed at regulating irrigation	
		-Water needs of indigenous population widely excluded from statutory water management regimes	
		-Promulgation of the Water Act No. 54 of 1956 with strong emphasis on riparian principle, but stronger role of state in water allocation (for non-agricultural industries)	

Post-colonial

	<i>1975 – 1990</i>	<i>1961 – 1994</i>	<i>1980 – 1992</i>
-1966: Botswana becomes an independent republic	-Mozambique becomes independent (1975)	-Continued manipulation of traditional leadership structures and development of “homeland” policies	-Periodic droughts resulting in calls for revision of Water Act
-Water Act of 1968 and the Tribal Land Act of 1970 transferred land and water administrative powers from traditional leaders	-FRELIMO government aims at eliminating traditional authorities and to replace them with alternative governing structures (village secretaries, etc)	-Consequent erosion of credibility of traditional leadership has undermined efficiency of many traditional governance regimes	
-Centralized water allocation through the Water Apportionment Board	-Natural resources are nationalized	-Water use primarily for commercial irrigation and industrial use, indigenous population widely excluded from access to water for commercial (and domestic) use	
-1974: policy to build small dams for livestock watering, rights of some communities not respected	-Weak implementation of natural resource government legislation		
	-Traditional structures remain strong, particularly in RENAMO-controlled areas		

Recent

	<i>1992 – present</i>	<i>1994 – present</i>	<i>1994 – present</i>
-Efforts at ‘democratizing’ society is resulting in gradual marginalization of the traditional institutions in the management of natural resources	-End of civil war (1992) and election of first democratic government	-Transition to democracy with first democratic elections on 27 April 1994	-Adoption of IWRM principles as contained in the Water Act and ZINWA Act (1998)
-Efforts to modernize water management e.g. production of the National Water Master Plan	-Adoption of National Water Policy (1995), which promotes wider public participation	-Adoption of White Paper on National Water Policy for South Africa (1997)	-Formation of Catchment and Sub-Catchment Councils for water management
	-Attempts to integrate traditional governance regimes in overall governance framework	-Promulgation of National Water Act (1998)	-Attempts at decentralizing water management, but no recognition of indigenous institutions
	-Decree 15/2000 recognizes the role of community authorities (including traditional leaders) in controlling natural resources	-Abolishment of riparian principle – water becomes public good with state as custodian of water resources	
	-Few research results, but initial evidence of functioning customary water management regimes	-Formation of Catchment Management Agencies initiated – objective: decentralized management and widespread stakeholder participation, but no explicit recognition of indigenous water management regimes	