



A Political Economy of Water in Southern Africa

Larry A. Swatuk

Programme on Environment and International Development, University of Waterloo, Canada;
swatukinthebushes@yahoo.com

ABSTRACT: Southern Africa is a region characterised by extensive socio-economic underdevelopment. Given water's key role in social organisation, water allocation, use and management in Southern Africa is embedded in deep historical and structural processes of regional underdevelopment. Gini coefficients of income inequality in several states of the region are the most extreme in the world. Recent data from South Africa shows that Gini coefficients of water inequality vary directly with income inequality. Recent attempts to improve water resources management in the region through IWRM have failed to consider these facts, focusing instead on a mix of institutional, policy and legal reforms. The results of these reforms have been poor. In this essay, I employ a modified version of Allan's (2003) 'water paradigms' framework to locate and assess the positions and interests of actors involved in water resources management in Southern Africa. The essay shows that Southern Africa's history of underdevelopment has created a dense web of powerful political, economic and social interests linked by a shared technocentric understanding of and approach to water use: i.e. water for 'high modern-style' development, or as labelled by Allen, 'the hydraulic mission'. What is less readily acknowledged is the wide-spread societal support for this mission. For this reason, ecocentric approaches to water management most commonly associated with influential international actors such as the IUCN and World Wide Fund for Nature have limited local support and are of minor relevance to Southern African decision-makers. However, actors supportive of an ecocentric perspective demonstrate considerable ability to inhibit water infrastructure development across the region. In the face of abiding poverty and inequality, and vulnerability to water insecurity, widespread societal support for a technocentric approach to resource use offers a pathway toward broad-based social benefits through the capture of the region's water resources. It is up to those with an ecocentric interest to ensure that these activities do not reproduce the environmental errors of the past.

KEYWORDS: Southern Africa, Southern African Development Community (SADC), underdevelopment, Integrated Water Resources Management (IWRM), technocentric, ecocentric, hydraulic mission

INTRODUCTION

While other nations try to reach the moon, we are trying to reach the village

Julius Nyerere (in UNESCO, 1974)

This article locates water resources management within the political economy of underdevelopment focusing specifically on the southern African region. The article incorporates and modifies some of the recent work of Allan (2003) and takes its cue from Mollinga's observation that "water resources management needs to draw from social and development theory because water resources management is embedded in broader social and development processes" (Mollinga, introduction to this collection). To quote him further: "Modes of water resources management are closely associated with concepts and trajectories of development, as existing in the form of patterns of accumulation (the dynamics of economic relations), modes of regulation (the dynamics of socio-political relations), and environmental trajectories (the dynamics of ecological systems)". Allan (2003) highlights the political nature of water resource allocation and management. In his view outcomes will always be partial

because they result from the complex give and take of numerous actors or actor networks negotiating on behalf of their specific interests. In Allan's view, history reveals that different perspectives have held sway and that change has come grudgingly. He labels these different perspectives 'paradigms', and argues that the water world has passed through five of them ranging from the pre-modern, modern, and various late-modern approaches culminating in the present day's Integrated Water Resources Management (IWRM) (I return to this in more detail below). Globally, IWRM is regarded as a widely accepted framework for managing water. However, Allan quite rightly shows that the IWRM framework acts less as a template than it does as an intellectual arena wherein actors with competing interests come together in negotiation and seek consensus on ways of using water to the satisfaction of all parties.

In southern Africa, negotiations around IWRM reflect the region's long history of interaction with and penetration by powerful global actors, forces and factors. southern Africa's general history of underdevelopment,¹ and of South Africa's peculiar role as an outpost of monopoly capitalism resulting in dependent development² and regional economic domination, has led to highly specific resource allocation and use patterns (Makgetla and Seidman, 1980; O'Meara, 1996) (see below). In the post-colonial era, these highly unequal resource use patterns have been reinforced (Bond, 2006; Feinstein, 2005).³ Given water's central place in all human activity, southern Africa's water resources allocation and management practices and structures reflect the underdeveloped character of the regional political economy: water security for the few, water scarcity for the many. Changing these practices and patterns requires getting 'out from underdevelopment' (Mittelman, 1988), a process not restricted to, but clearly related to water sector reforms.

Given this difficult developmental terrain, what is the future for IWRM? This essay argues that where positive change – as defined by supporters of IWRM – is realised, it is generally the result not of the triumph of rational science over ignorance, but rather of making powerful actors see that they stand to benefit from change, or where the costs of change will be minimal or non-threatening.⁴ Where there is limited or no 'progress', this is often the result not of 'bad governance' but of acting on decisions that grew from suboptimal negotiated outcomes (Klaphake and Scheumann, 2008). To move forward with an IWRM agenda, therefore, requires strategic thinking that recognises and works with the powerful web of vested interests that view water from a technocentric point of view.

In explication of this argument, the article proceeds as follows. Section 2 describes the rise of IWRM within the framework of Allan's five paradigms. It is argued there that these paradigms are better understood as perspectives that vary along a technocentric-ecocentric continuum.⁵ When set within the historical, regional political economy of southern Africa (the subject of Section 3), particular configurations of social power are revealed in support of certain perspectives and approaches to water resource allocation and management. These configurations of social power, also called 'actor coalitions'

¹ Understood as "the blockage which forestalls rational transformation of the social structure of Third World countries; rational not in the commonsensical meaning that the options are deduced from reason alone, nor in the bureaucratic sense of a neat adjustment of the means to ends. Rather, rational in that the interests and needs of the majority are increasingly dominant. What blocks development is an internal and external constellation of power and privilege. Development entails but is not synonymous with economic growth. In my usage, development is the increasing capacity to make rational use of natural and human resources for social ends" (Mittelman, 1988).

² See Gereffi and Wyman, 1990, for a definition and discussion of 'dependent development'.

³ For example, in present day South Africa an estimated 96% of commercial, arable land remains in the hands of a limited number of white farmers. At the same time, rural unemployment among blacks is estimated to be 70% (see, www.npr.org/templates/story/story.php?storyId=5624419).

⁴ Hence the utility, in my view, of pursuing IWRM opportunistically – that is, making inroads when and where possible, always cognizant of the constellation of social forces active in the issue area.

⁵ Technocentric approaches regard humans as apart from nature, and nature as instrumentally serving the needs and desires of humans. A classic technocentric approach is one that regards any water reaching the sea as 'wasted' and better put to human use upstream. Ecocentric approaches regard humans as part of nature, and nature as having value intrinsic to itself. In truth, most of us fall somewhere toward the middle of these extreme positions with universal support for potable water delivery systems being a case in point (see Hayward, 1995 for a thoughtful overview).

or 'actor networks', are described in Section 4 in terms of (i) the technocentric-ecocentric divide and (ii) their political and economic influence. Section 5 concludes that in the face of abiding poverty and inequality, the general support for a technocentric approach to resource use offers a pathway toward broad-based social benefits through the capture of the region's water resources. It is up to those with an ecocentric interest to ensure that these activities do not reproduce the environmental errors of the past.

IWRM AS DISCURSIVE CONTEXT

Water reforms throughout the world are being undertaken on the basis of Integrated Water Resources Management (IWRM). IWRM, as defined by the Global Water Partnership, "aims to ensure the coordinated development and management of water, land and related resources by maximising economic and social welfare without compromising the sustainability of vital environmental ecosystems" (GWP, 2000). In this rendering, IWRM is described as a process, a means to the end of using water without "compromising vital ecosystems" but still "maximising economic and social welfare".

As with many concepts, IWRM is also envisioned as an end-point: i.e. water management that is coordinated and integrated rather than fragmented and disintegrated. IWRM also promotes (and, where implemented, displays) treating water in a holistic fashion, not merely as a commodity to be shifted from A to B in order to drive industry or grow food; considering the river basin as the optimal management unit, therefore placing water within its natural ecosystem limits; reaching decisions through an inclusive process where all stakeholders are consulted and their interests meaningfully considered, as opposed to leaving decisions to a narrow nexus of bureaucrats, technical experts and financiers; and balancing often competing perspectives of water as a social and economic good (see, also, UN, 2006; UNDP, 2006).

The rise of IWRM to the centre of global water management is nothing short of remarkable (see Conca, 2006 for a detailed discussion). It marks the apex of more than three decades of discussion and debate by an increasingly inter-linked network of experts, interested parties and influential decision makers (Van der Zaag, 2005; Merrey, 2008). General agreement among water professionals, however, is not the same as having marshalled an effective force for meaningful change. In time, this may be so. Yet, given the intensely political nature of water development (Postel, 1999), it has proved possible to both support IWRM and to continue to "push rivers around" (Conca, 2006). After all, water does not necessarily obey the laws of gravity; it flows toward money (Reisner, 1993).

Recently, Allan (2003) suggested that IWRM had become a "new sanctioned discourse" marking a "fifth paradigm" in the history of water management – though he suggests it be more accurately labelled IWRAM to include 'allocation' as a key marker of the political nature of resource use decisions. Briefly stated, the first paradigm is associated with pre-modern communities with limited technical and organisational capacity. The second paradigm is that of industrial modernity – commonly referred to by sociologists as 'high modernity' – where the state and private sector activities, assisted by developments in science and technology, gave shape to the 'hydraulic mission' (i.e. harnessing water resources for human needs as typified by the era of 'big dam building' and the rapid extension of irrigation systems). This period, extending for roughly 100-150 years to about 1980, was characterised by a firm belief that Man could control nature, and that scientific knowledge could provide perfect information for decision-making.

Beginning with the environmental movement in the 1960s, Allan argues that the next three paradigms resulted from society-wide skepticism in the North regarding the ability of science to find solutions to problems deriving from human activity or to clearly understand the overall impact of proposed actions, an era labelled 'reflexive modernity'. The third paradigm reflects the interests of environmentalists in reducing the human impact on the natural world. The fourth paradigm "was inspired by economists who had drawn the attention of water users in the North to the economic value

of water and its importance as a scarce economic input ... The environmental and economic phases are still in train ... [T]hey are being supplemented by a new fifth paradigm, which is based on the notion that water allocation and management are political processes" (Allan, 2003).

Whereas other paradigms were pushed by partial interests (i.e. civil society, government, social movements, business), the fifth paradigm argues that all of these actors are central to the policy making discourse, hence recent emphases on 'stakeholder participation'. An important observation made by Allan (2003) is that, whereas the "semi-arid plural North" can be seen to have accepted most of the ideas of the reflexive modern period, "the South, where about five-sixths of the world's population live, is still very much involved in its hydraulic mission – the second paradigm". Thus, "[t]he water policy discourses in the North and South are different. Those 'outsiders' from the North who insist on preaching the environmental and economic values of water have little impact on the 'insider' southern water management discourses".

While Allan's framework is a useful heuristic device, what he calls "paradigms" are more accurately understood as perspectives (see Swatuk 2005b for an application). Following Kuhn (1962) in his *The structure of scientific revolutions*, it seems to me that the long-dominant approach to water management – i.e. the 'modernisationist' approach wherein Man confidently bent nature to his will – continues as 'normal science', but has increasingly revealed a number of anomalies over the last forty years. So, in recent times the dominant scientific approach has been challenged on the basis of new knowledge of the environmental, economic, and socio-political costs of unreflective approaches to manipulating the natural world. "Ecological modernisation" (Hajer, 1995) represents a refinement of the high modern position in that it acknowledges the fallibility of human knowledge and the necessity of determining ways to lessen the environmental impact or negative social costs of human systems of production.

In contrast to Allan, this essay suggests that water discourses reflect an on-going intra-paradigm debate among approaches that range along a technocentric-ecocentric continuum not just to resource use, but to the human-nature interface with most actors throughout the world demonstrating technocentric beliefs and practices. This approach reconfigures Allan's categories, demonstrating the overlapping interests among very differently empowered and motivated actors located both in the North and in the South. As will be shown below, Allan's neat categorisations of North/5th paradigm and South/2nd paradigm are not readily applicable to southern Africa where all perspectives – from 1st to 5th 'paradigm' – co-inhabit a local geography contested over by a mixed set of actors with divergent interests from across the globe. To understand the positions and interests of the actors, it is necessary to know how resource access, allocation and use have evolved over time. To understand possibilities for change, it is necessary to understand the historical basis for settled social relations. Thus, the paper now turns to a discussion of southern Africa's political economy.

THE SOUTHERN AFRICAN SETTING: A HISTORY OF UNDERDEVELOPMENT

A critical – as opposed to liberal – political economy approach to southern Africa must begin with an examination of the history of state forms (Cox, 1987). For the sake of brevity, several points will be made here. First, precolonial societies in southern Africa were characterised by fluid borders but firm agreements among different peoples (Denoon and Nyeko, 1972). Since people were few and land was plenty, formal physical borders were inessential (Herbst, 2000). Where water is concerned, populations often settled along both banks of perennial/ephemeral rivers. This changed dramatically with European settlement and under a European imperial policy that placed a pre-eminent value on African land – not people. A primary reason the region is characterised by so many transboundary watercourses is the convenient role rivers played in mapping and border-making among European powers (see, for example, Steel, 1917).

Second, human settlement patterns were altered dramatically during the colonial and post-colonial eras. In settler states such as the Rhodesias (present-day Zambia and Zimbabwe) and South Africa, as

well as those states with significant settler populations (Botswana, Namibia, Swaziland), small, sustainable communities were either divested of their lands and/or herded into so-called 'homelands', left either to eke out a living on poor lands or to be forced into migrant wage labour on the new plantations and in the mines. The result is that in southern Africa "relative prosperity in the region tends to be inversely proportional to water availability" (Conley, 1996). Mineral exploitation led to large settlements developing around these resources which often lay far from available water resources (see, e.g. Turton et al., 2006), where annual rainfall was limited and where evaporative demand was often highest (Pallett, 1997). So, while the Congo river carries more than a hundred times as much water, and the Zambezi ten times as much water as the Orange river, it is along the Orange river – and its main tributary the Vaal river – that population is most densely settled. Such linked phenomena have led to a series of long-term water problems in the region such as inadequate provision for growing urban populations, extensive point-source and downstream pollution from mining and farming, aquifer depletion from groundwater overuse and 'resource capture' in remote areas through networks of dams, pipelines, and energy grids to provide power and water for cities and industries far away but at the cost of the ecological marginalisation of subsistence farmers in rural areas.

Third, these colonies were designed to serve the interests of Europeans – not Africans – most of whom lived in Europe (Crosby, 1986). Coastal cities and transportation networks grew in service of European extraction of African resources from the continent and the delivery of European manufactures to new markets. Today, SADC⁶ states are overwhelmingly resource based economies reflecting their historical incorporation into global capitalism as the handmaidens of European industrialisation. Most earn a significant portion of their foreign exchange from the export of raw, unfinished or minimally beneficiated goods such as minerals, precious stones, cash crops such as tea, coffee, cocoa, sugar, cotton and various fruits (see table 1).

Table 1. Export profile

State	X % of GDP	Manufacturing as % of X	Primary goods as % total exports
Angola	73.5+	3.6	--
Botswana	50.7	3.9	--
DRC	19	--	--
Lesotho	48	--	--
Malawi	27	--	84
Mozambique	30	--	96
Namibia	46.3	13.5	58
South Africa	27.1	18.6	42
Swaziland	84	--	23
Tanzania	19	--	80
Zambia	16.4	11.7	90
Zimbabwe	42.8	12.8	72

+ U.S. exports make-up 13% of its GDP; exports from Canada and Western European states are all greater than 20% of GDP. Source: World Bank (2008) and UNDP (2008)

Where finished goods are a key export, these products are tied to agriculture, or are the consequence of particular arrangements with an importer (e.g. the USA under the Africa Growth and Opportunities Act (AGOA), the European Union (EU) under the Cotonou Agreement) so subject to quotas and/or non-tariff barriers to trade (NTBT), and which discourage the development of backward and forward

⁶ Southern African Development Community: there are presently 15 member states, but I am including only the 12 African continent-based members in my discussion, excluding Madagascar, Mauritius and Seychelles. The 12 states are Angola, Botswana, DR Congo, Lesotho, Malawi, Mozambique, Namibia, South Africa, Swaziland, Tanzania, Zambia and Zimbabwe.

linkages in the economy.⁷ In South Africa's case, the SADC region is an important market for its finished goods. Although South Africa has an extensive manufacturing base, the vast majority of these are consumer goods whose manufacture is dependent on the import of capital and intermediate goods from abroad. Thus, South Africa's manufacturing base is heavily dependent on its primary sector for the generation of foreign exchange to purchase necessary inputs. South Africa's manufacturing sector, thus, is a net exporter of capital (O'Meara, 1996; Feinstein, 2005).

Also typical of underdevelopment, SADC states mainly import finished goods from outside of the continent. Much of this trade remains with the former colonial power (Belgium, Britain, Germany, Portugal), so reaffirming historical dependency relationships. Intra-SADC trade is estimated to be 24% of total trade (SADC, n.d.), but most of this is realised through a series of bilateral agreements between South Africa and the region. There has been a general decline in the terms of trade since 1980 (SADC, n.d.).

There are serious limitations to development placed upon resource dependent economies. Despite recent surges in commodity prices, their long-term downward trends – particularly for minerals and agricultural products – vis-à-vis finished goods limit a state's ability to generate capital for development. Numerous producers of non-essential and/or readily substitutable commodities (such as coffee, tea, prawns) ensure low price ceilings. Even essential and non-substitutable goods such as oil are subject to wild fluctuations in price. Experience shows that windfall gains through price spikes such as those currently being experienced are not readily turned into long term development gains. Rather, they often lead to ill-advised practices of spending, borrowing and lending. Non-oil producing SADC states are especially hard hit by price rises. So, where gains in the prices of other commodities encourage production, the costs of transport often undermine such gains. Where profits from precious metals, minerals and gemstones (e.g. vanadium, platinum, uranium, gold, diamonds) are more stable, these are nevertheless wasting assets. Perhaps most importantly, "especially for minerals, production is highly-capital intensive, offers low incentives for educational investments, and provides a greater danger of intervention by parasitical rentiers" (Bond, 2006). Put differently, most SADC political economies maintain their colonial profile wherein a small group of elites do very well for themselves via the derivation of rents through the state, while the vast majority of the population are left to fend for themselves.

In short, with regard to long term capital accumulation for extensive social development, there is no substitute for industrialisation and the deepening of capitalism within an economy (Mittelman, 1988). According to Pettman (1979):

It is far from clear that a majority of people in the periphery specifically demand industrialization in fact, but they do generally look for its products and its promise of social mobility and advancement, if not for themselves then for their children, and the only mode of production known to be able to fulfil requests like these *en masse* is the industrial one.

Aside from the special cases of South Africa and Zimbabwe, SADC states have failed to diversify their economies much beyond their initial, delivered colonial profiles. As with their Sub-Saharan counterparts, SADC states remain, in Mazrui's terms, "beverage economies", growing cocoa, tea, coffee, sugar, and citrus fruits to be converted into finished goods in Europe (Mazrui, 1986). The special characteristics that led to South African and Rhodesian/Zimbabwean industrial development are not readily replicable;⁸ nor are the specific circumstances leading to their industrialisation desirable, i.e. the determination to entrench race-based rule.

⁷ For example, under AGOA, finished textiles from select African partners may be imported as long as a certain percentage of the garment is made from spun American cotton fabric.

⁸ Much of South Africa's industrial base developed over the course of World War II as part of the allied war effort. Both South African and Rhodesian post-war industrialization received 'boosts' from worldwide sanctions against their racist regimes so necessitating concerted import substitution industrialisation.

For a short time during the 1970s-80s, the anti-colonial and anti-apartheid struggle galvanised the region, with creation of both the Frontline States (FLS) and the Southern African Development Coordination Conference (SADCC) being high water marks of regional cooperation (Anglin, 1983). However, the sheer might of South Africa (whose share of regional GDP was, in the 1980s, about 75%), ensured that the SADCC project of self-sustaining economic development would never succeed. Yet, opening already export-dependent primary commodity producing economies (on average, SADC states derive roughly 57% of their GDPs from trade) simply ensured that any remaining 'infant industries' would be killed off by global competition. Whereas the Southern African Development Community (SADC) was created out of SADCC to give concrete legal and institutional form to regional economic development, all of these states – including South Africa – have had enormous difficulty altering their historically-derived structures of production in the new international division of labour (Swatuk and Shaw, 1994).

SADC STATES TODAY

In fact, the picture since the end of apartheid is rather glum. Table 2 illustrates the changing Human Development Index (HDI) values for SADC states over the last 30 years. In the last 10 years, only Mozambique and Tanzania have registered higher HDI values. Of the eight member states for which there is data, only three have higher HDI values in 2004 than they did in 1975, all of which – Botswana, Lesotho and Malawi – have registered declines since 1995.

Table 2. Trends in SADC state HDIs

State	HDI rank (of 177 countries)	1975	1985	1995	2004
South Africa	121	.653	.703	.741	.653
Namibia	125	--	--	.694	.626
Botswana	131	.500	.636	.660	.570
Swaziland	146	.529	.583	.604	.500
Lesotho	149	.463	.535	.573	.494
Zimbabwe	151	.548	.642	.591	.491
Angola	161	--	--	--	.439
Tanzania	162	--	--	.423	.430
Zambia	165	.470	.486	.425	.467
Malawi	166	.327	.368	.414	.400
DRC	167	.414	.431	.392	.391
Mozambique	168	--	.290	.330	.390

Source: UNDP 2006

The Human Development Index (HDI) is a weighted composite measure of GDP/capita, life expectancy, and education. It shows how much capital is accumulated within a state, to what use it is put and how widely it is spread, with health and education regarded as key indicators of democratic development. As shown in table 3, those states heavily dependent on oil or mineral wealth, or a combination also including plantation agriculture and manufacturing, show high GDP indexes (i.e. above.67). Heavily agrarian societies, on the other hand, show an inability to accumulate capital. Most SADC states perform well in the education index, but almost all are dragged down by the life expectancy index, so reflecting the costs of the AIDS pandemic in the region (Bell, 2006).

Table 3. SADC state HDI: selected indicators

State	GDP/cap (US\$)	Life expectancy	Adult literacy	Life expec. index	Education INDEX	GDP index
South Africa	11,192	47	82.4	.37	.80	.79
Namibia	7,418	47.2	85	.37	.79	.72
Botswana	9,945	34.9	81.2	.16	.78	.77
Swaziland	5638	31.3	79.6	.10	.72	.67
Lesotho	2619	35.2	82.2	.17	.77	.54
Zimbabwe	2065	36.6	90*	.19	.77	.51
Angola	2180	41	67.4	.27	.53	.51
Tanzania	674	45.9	69.4	.35	.62	.32
Zambia	943	37.7	68	.21	.63	.37
Malawi	646	39.8	64.1	.25	.64	.31
DRC	705	43.5	67.2	.31	.54	.33
Mozambique	1237	41.6	46*	.28	.47	.42

* According to UNDP this is unreliable data.

Source: UNDP (2006)

Aid dependence remains high in the region, where net Overseas Development Assistance (ODA)/capita is at 1980 levels. As a percentage of GDP, ODA has declined from 1990 levels in all SADC states except for Angola, DRC and Mozambique. It constitutes a significant portion of GDP in Tanzania (16.1%), Zambia (20%), Malawi (25.3%), the DRC (27.4%), and Mozambique (20.2%). Debt burdens are significant across the region, so limiting SADC state capacity to access new capital. And whereas Foreign Direct Investment (FDI) quadrupled in the latter half of the 1990s – from US\$691 million in early 1990s to US\$3061 million during 1995-98 – this reflects the post-apartheid honeymoon period and obsession with South Africa. (And though South Africa reaped the lion's share of this FDI, it constituted merely 0.3% of its GDP, an amount equal to its ODA receipts) (UNDP, 2006; SADC, n.d.).

Poverty is rife. Fully 70% of the region's population exist on less than US\$2/day, while 40% exist on less than US\$1/day. Agricultural production as measured in average daily per capita calorie supply declined in half of SADC states in the period 1987-97, and increased marginally in the others. SADC claims that, in order to achieve the Millennium Development Goal (MDG) of halving poverty by 2015, the region's economies must grow by on average 10%/annum (SADC, n.d.). Yet, as table 4 shows, not even the region's 'success story', Botswana, has come anywhere near this figure, although Angola has recently demonstrated high rates of economic growth (off of a very low base). Large proportions of SADC populations lack access to either a sustainably improved water source or sanitation, so putting them at significant risk of water borne disease. Lastly, and perhaps most significantly – for it knows no class boundaries – is the HIV+ rate for those aged 15-49. As shown in table 4, regional integration has had a significant downside to it. For all of those states that have contributed to the growth of South Africa's economy (as labour reserves, as a pleasure periphery, and as markets for finished goods and sources for raw materials) are caught in a serious web of pandemic disease. Virtually no state other than South Africa has the economic capacity to adequately address this problem. All land based SADC member states reside within the bottom 33% of the world's surveyed states according to HDI ranking. Eight member states are among the 18% of the world's poorest states – all of this in spite of 25 years of regional cooperation.

Table 4. Select Indicators for SADC states

Country	GDP growth 1975-2004 %	GDP growth 2005-06 %	% HIV+ 15-49 age group	% pop with sustainable access to	
				improved water source (2004)	improved sanitation (2004)
Angola	-0.7	11.1	3.7	53	31
Botswana	5.7	4.0	24.1	95	42
DRC	-4.8	1.9	3.2	46	30
Lesotho	4.7	3.1	23.2	79	37
Malawi	-0.4	6.2	14.1	73	61
Mozambique	2.6	6.6	16.1	43	32
Namibia	-0.8	3.6	19.6	87	25
South Africa	-0.5	3.9	18.8	88	65
Swaziland	2.1	2.5	33.4	62	48
Tanzania	0.8	3.3	6.5	62	47
Zambia	-2.0	4.3	17.0	58	55
Zimbabwe	-0.3	-5.4	20.1	81	53

Source: UNDP, 2006; World Bank, 2008

Yet, while SADC states are poor, there are pockets of extreme wealth and privilege. Indeed, countries such as Angola, Botswana, DRC, Namibia, and South Africa generate vast amounts of mineral and oil wealth. Plantation agriculture reaps large rewards in Malawi, South Africa, Swaziland, Zambia, Zimbabwe and even Botswana. As is typical of rentier state forms and/or those with dualistic, enclave economies, this wealth neither trickles very far down nor spreads widely to other sectors. Extremely skewed income distribution is a significant barrier to human development as those with the capacity to initiate change feel no need to do so. According to UNDP (2008) data, only Mozambique and Tanzania have Gini coefficients of income inequality below 40 (where 100 equals perfect inequality; and 0 perfect equality). Botswana (63), Namibia (74.3), Lesotho (63.2) and Swaziland (61) are all above 60, with South Africa at 58. Many of these data are now ten or more years old, and it would not be unreasonable to hypothesise that, after another decade of structural adjustment, these values are now even higher.

So, a significant barrier to development is the insulation from poverty of an influential cohort of people within the region. Given the enclave and extroverted character of these economic drivers, sectors and/or specific industries that have the potential to contribute to national and regional development operate largely outside of these geographical and social parameters, with Angola's Cabinda off-shore oil development being an extreme example of this.

A key challenge for all SADC states is to channel more of the wealth created by these activities into local and regional political economies. Such potential is revealed in tables 5, 6 and 7 below. Table 5 suggests that despite limited amounts of arable land in several SADC states, the amount of land under irrigation could easily be increased. Only South Africa (irrigating 14,980 km² out of an arable land total of about 140,000 km²) has put more than 10% of its arable land under irrigation. Even Botswana shows potential for much more irrigation. Following from this observation, it is also clear from table 6 that available freshwater is under-utilised throughout most of the region. Indeed, given the wet/dry character of the climate, simply improving storage capacity to capture wet season run-off would help facilitate improved crop yield (Falkenmark and Rockstrom, 2004). However, what is implied more than revealed in tables 6 and 7, is the dualistic nature of SADC agricultural economies. Table 6 shows that most abstracted freshwater goes to agriculture. However, the small amounts of land irrigated throughout the region account for the lion's share of this usage, i.e. plantation agriculture for cash crop

production. Moreover, much of the land that might be put under small-scale irrigation (e.g. one farm/one dam) is privately held by a small number of influential actors. For example, in South Africa the IFAD estimates that smallholders control less than 13% of all agricultural land, whereas about 60,000 commercial farmers control the rest. Similarly, in Namibia some 5000 commercial farmers own somewhere between 67-80% of all land, and in Zimbabwe prior to Mugabe's 'land revolution' 5000 white farmers (the descendents of settlers) owned 45% of all land, with the Oppenheimer family of South Africa holding 960,000 ha – a territory equal to one-third the size of Belgium (Wongibe, 2002). So what appears to be a problem of water scarcity, is upon closer investigation also a problem of land hunger – a serious problem throughout the SADC region today.

Table 5. Land and agriculture

State	Territory km ²	Arable land % of total	Permanent crops % of total	Other % of total	Irrigated land km ²
Angola	1,246,700	2.6	.23	97.1	800
Botswana	600,370	0.6	.01	99.3	10
DR Congo	2,345,410	2.9	.47	96.7	110
Lesotho	30,355	10.9	.13	89.0	30
Malawi	118,480	20.7	1.18	78.1	560
Mozambique	801,590	5.4	.29	94.3	1,180
Namibia	824,418	1.0	.01	99.0	80
South Africa	1,219,912	12.1	.79	87.1	14,980
Swaziland	17,363	10.3	.81	88.9	500
Tanzania	945,087	4.2	1.16	94.6	1,840
Zambia	752,614	6.9	.04	93.0	1,560
Zimbabwe	390,580	8.2	.33	91.4	1,740

Source: CIA Factbook (www.cia.gov/search?NS-collection=Factbook)

Table 6. Freshwater resources

State	Total renewable water km ³ (yr of data)	Freshwater withdrawal km ³ /yr	Per cap freshwater withdrawal m ³ /yr	% domestic	% industry	% agriculture
Angola	184 ('87)	0.35	22	23	17	60
Botswana	15 ('01)	0.19	107	41	18	41
DR Congo	1283 ('01)	0.36	6	53	17	31
Lesotho	5 ('01)	0.05	28	40	40	20
Malawi	17 ('01)	1.01	78	15	5	80
Mozambique	216 ('92)	0.63	32	11	2	87
Namibia	46 ('91)	0.30	148	24	5	71
South Africa	50 ('90)	12.5	264	31	6	63
Swaziland	5 ('87)	1.04	1,010	2	1	97
Tanzania	91 ('01)	5.18	135	10	0	90
Zambia	105 ('01)	1.74	149	17	7	76
Zimbabwe	20 ('87)	4.21	324	14	7	79

Source: CIA Factbook (www.cia.gov/search?NS-collection=Factbook)

SADC states have large rural populations living on communal land in small, scattered settlements dependent for their sustenance on a combination of rainfed agriculture and wage-labour. Everywhere in the region they are "hemmed in" by vast tracts of state land and private leasehold land (Moyo, O'Keefe and Sill, 1993). As demonstrated in table 7, there is an uneven relationship between the number of people active in the agricultural sector, and that sector's contribution to national GDP. While the vast majority of rural people are active in agriculture, that sector's contribution to GDP is limited at best. Only in exceedingly poor countries such as Malawi, Mozambique and Tanzania does agriculture contribute significantly to national GDP.

Table 7. Employment in agriculture and agriculture value-added

State	Rural population (millions)	% employed in agriculture	Agricultural value-added (US\$ millions)	US\$/worker	Agriculture as % of GDP
Malawi	10.5	83.2	627	66	37.8
Mozambique	12.9	66.3	1,220	83	23.1
Namibia	1.3	65.4	548	595	11.0
South Africa	19.1	41.2	5,565	947	3.1
Tanzania	28.6	76.2	4,797	167	45.8
Zambia	7.5	65.0	1,047	136	20.7
Zimbabwe	8.3	64.5	744	95	17.6

Source: World Bank 2008

One result of this economic dualism is the worrying trend toward urbanisation – mostly due to outmigration from rural areas – throughout the region. SADC states are becoming increasingly 'urbanised', with seven SADC states expected to have 40-65% of their populations living in cities by 2015 (UNDP, 2006). This is made more problematic by the fact that the primary and secondary centres (e.g. Harare and Bulawayo in Zimbabwe; Blantyre and Lilongwe in Malawi; capital cities across the region) are growing beyond all capacity of the municipalities to smoothly manage the transition.

IMPLICATIONS FOR WATER MANAGEMENT OR CAN YOU FLOAT IWRM ON A SEA OF UNDERDEVELOPMENT?

Given that water is at the centre of all human activities, the ways in which it has been accessed, allocated and managed throughout southern Africa reflects the difficult history of the region: water has served underdevelopment. Colonists and settlers developed water delivery and sewerage systems for small urban areas. Commercial farmers were free to use whatever groundwater they could get their hands on, and enjoyed riparian rights over surface water. Large dams were built to provide hydro-power to burgeoning cities established around the region's mines. Intra- and inter-basin transfer schemes spread like arteries to the heart of the industrial giant, South Africa, and were planned across much the rest of the region during the first half of the Twentieth Century. Mines had privileged access to water resources. Indigenous Africans were left in the hands of 'native authorities' who provided technical assistance for such things as borehole development. In settler societies they were forcibly relocated to marginally productive lands where, in almost every case, they and their descendents remain today. In areas of marginal interest to settlers, colonists and imperialists alike, African resource management methods were left undisturbed and have only come to light today as they are being undermined by the regional water reform process and its emphasis on new institutions (Sokile and Van Koppen, 2004; Maganga, 2003). An extensive system of migrant labour gave rise to extensive and unserved townships that, today, ring the cities.

The post-colonial period did little to alter these patterns, although newly independent states did undertake numerous ambitious development projects all of which needed or concerned water

resources management. In the meantime, the cities grew, populations grew, the unequal division of agricultural land worsened to create resource use pressures in so-called 'tribal lands', and African state policy-makers continued to focus their efforts on colonial-era economic activity, in particular deriving rents from mining and cash crop production. Into this mix was thrown more than two decades of economic crisis brought on by a combination of global events beyond the control of southern Africans. Ten to twenty-five years of structural adjustment conditionalities – deregulation, privatisation, desubsidisation, retrenchment of state workers – in SADC states have had the perverse impact of distilling down existing configurations of power as is partially reflected in the Gini coefficients of income inequality cited above (see Callaghy and Ravenhill, 1993 for a detailed overview).⁹

The present situation as it relates to water resources management may be summarised as follows:

- Southern Africa is accurately described as a 'water poor' region (SADC, 2005)
- Over time, settlement patterns, resource allocation mechanisms, and delivery systems added to the region's water stress (Bate and Tren, 2002; Chenje and Johnson, 1996)
- Most SADC states face severe human, financial and technical resource shortages
- South Africa is the exception to the above point, but faces the most severe developmental challenges due to the historical impacts of apartheid
- Rapid urbanisation throughout the region strains municipal budgets and capacities far beyond their present means
- Most urban water and sewerage infrastructures are failing or completely failed, having been created during the colonial era and designed to handle populations far below what cities and towns hold now
- Enclave development based particularly around minerals and hydrocarbon exploitation generate significant amounts of government revenue but create little employment and benefit a narrow band of the region's people
- Dualistic agricultural production, wherein a small strata of commercial farmers control most arable land, use the most ground and surface water, and grow cash crops for export, directly benefits few people and place great stress on rural populations inhabiting marginal communal lands and dependent upon rainfed agriculture (e.g. Cullis and Van Koppen, 2008)
- All SADC states have difficulty accumulating capital through productive enterprise. Aside from small, wealthy states such as Botswana and Namibia, most SADC states are highly indebted and remain committed to current structures of production in order to generate foreign exchange to pay debts and pay for imports. This generally leads policy makers to take 'lines of least resistance' rather than risk economic and political failure through innovation.
- All SADC states face drought and flood-proneness to varying degrees and are keen to better control their socio-economic fates through large-scale infrastructure projects
- All SADC states lack a significant middle-class, and generally divide between a limited number of wealthy and a large number of impoverished people. These groups therefore are not equally vulnerable to risk. Building a united coalition around risk mitigation is therefore very difficult: southern Africans are disunited within states but united across states by, among other things, class.

⁹ With regard to water access and allocation, this is clearly revealed in a recent study by Cullis and van Koppen (2008) which shows the Gini coefficient on inequality in water use in South Africa's Olifants River basin mirrors exactly South Africa's Gini coefficient on income inequality.

- Across SADC sectors and programmes, South Africa wields disproportionate power and drives the regional integration agenda (Swatuk, 2000).
- Given the multiple stressors faced by SADC states and citizens, leaders generally are content to let donors drive projects and programmes as long as these activities do not negatively affect their interests. This raises questions regarding 'ownership' of and 'commitment' to particular development activities.
- There are many people in all SADC countries who lead extremely satisfying lives under current conditions
- There are many more people in all SADC countries who are desperately poor, landless, subject to HIV/AIDS, gender-based violence, violent crime, and daily die from readily preventable disease

Somewhat naively, purveyors of IWRM have stepped into the middle of this setting intent on reforming national and regional approaches to water resources management (see Swatuk, 2002 and 2005a for overviews). Several coterminous events made SADC a candidate for global support for water reform. The arrival of IWRM onto the global scene in the early 1990s coincided with South Africa's reintegration into the world community following the demise of apartheid. This included a central role in the newly transformed Southern African Development Community wherein South Africa with its disproportionate economic power and human, financial and technical resource capacity was viewed as a potential regional engine of economic development. It also coincided with extreme weather events in southern Africa – extensive and persistent drought followed by devastating floods – that combined to move several states to reconsider the sustainability of their water resources under current practices (Swatuk, 2002 for details). Water resources management – both transboundary and sub-national – was to be, in many ways, the entry point for enhanced regional cooperation, i.e. a "new regionalism" (Soderbaum, 2004).

IWRM implies a systematic and coherent approach to resource use. Indeed, there are various instructional manuals and CD-ROMs available from organisations such as Global Water Partnership (GWP) and Cap-Net (Capacity Building Network for IWRM) that illustrate how to go about implementing IWRM.¹⁰ However, achieving any of its normative goals has proved exceedingly difficult, and has led many scholars toward a re-evaluation of its assumptions and methods (Biswas, 2004). This is no less the case in southern Africa (Van der Zaag, 2005) where the main challenges are described as "political", and where the discourse on IWRM has revealed several points of contention: inter alia, stakeholder participation; water as an economic good; water as a holistic resource; the river basin as the unit of management; and infrastructure development (Gumbo and Van der Zaag, 2002; Swatuk, 2005a; Merrey, 2008). These issues are not individually resolvable as together they reflect actors' understandings of what water is, who should have access to it, for what purpose, and how decisions regarding allocation, use and management are made.

It seems to me that, in order to move beyond water resource allocation and management that serves and reinforces underdevelopment, toward equity and sustainability, it is necessary to augment the current emphasis on stakeholder participation, capacity building, and baseline data gathering and information sharing, with a careful analysis of the interests at play among all actors. In addition, and following Allan, it is also necessary to examine the underlying philosophical basis for these interests. In carefully mapping out this intellectual and practical terrain, we may be better able to identify possibilities for the creation of coalitions whose mutually shared interests may result in mutually beneficial outcomes.

¹⁰ See, for instance, www.cap-net.org and www.gwpforum.org/servlet/PSP where you may access such things as the 'IWRM Toolbox' and the tutorial on IWRM.

Technocentric coalitions

Table 8 and figure 1 illustrate the fact that the most influential actors in the water sector in southern Africa hold technocentric beliefs. They may, however, differ among themselves regarding the importance of environmental, economic or social issues to their decision-making (highlighted under 'position' and 'interest' in table 8). They derive their power over water through historical processes (highlighted under 'influence' in table 8). Historically, the more complex the water infrastructure, the more removed the decision makers from the resource itself (Van der Zaag and Bolding, 2008). In Southern Africa, access to water was made subject to laws written by and for colonists, ultimately inherited by sovereign states. Riparian rights were granted to settlers. Groundwater was often free to those who could exploit it. The use of transboundary water was negotiated among colonial/imperial powers and codified under treaty law. Indigenous systems of allocation, use and management were discredited, just as African forms of social organisation were displaced by the making of colonies and states. Today's water 'managers' are the out-growth of this colonial mission. This group includes central governments broadly defined, traditionally influential (Finance, Industry, Trade, Development, Energy, Minerals) and less influential ministries (Tourism, Environment, Water and Forestry, Rural Development), municipal governments tasked with delivery of services, mine-owners, industrialists, commercial farmers, and SADC Heads of State and Government – almost all of whom came of age during the height of the modernisation era in the 1950s and 1960s.

Their view of water as a developmental tool is demonstrated individually in National Development Plans, and collectively, following the restructuring of SADC, in the inclusion of the Water Division within the Directorate of Infrastructure and Services. As stated in the Foreword to the Annotated Strategic Plan 2005-2010 (SADC, 2005):

[SADC] has acknowledged the importance of water in regional integration and development and has proceeded to adopt a range of measures in support of the joint management of water resources ... This is best shown by its project portfolio, which illustrates a paradigm shifting from the creation of the enabling environment for joint management of water resources to promoting infrastructure development that delivers benefits to the people.

Four strategic areas have been identified: resource planning and management; capacity building; governance; and infrastructure development.¹¹ The logic connecting the four strategic areas is as follows. The region's hydraulic infrastructure as currently developed was undertaken haphazardly over time to satisfy partial (e.g. colonial; commercial; national) needs with limited understanding of or concern for the overall hydrological cycle or the needs of people throughout the region. Therefore, it is necessary to gather appropriate data,¹² undertake skills training, implement systems of governance that ensure widespread benefits from water development, and capture the resource and put it to work for broad based socio-economic development.

Hence, there is much emphasis on resource development in the SADC strategic plan. For example, the strategic plan lists 20 short-term power generation projects in SADC being undertaken in 11 countries as of 2004 estimated to generate 6,700 MW of power by 2010 at a cost of US\$ 7.9 billion (SADC, 2005; SADC, 2008). To this list, numerous other short-term energy, multi-purpose dam, and water supply and sanitation projects may be added. Longer term energy projects are in various stages of planning and execution. These will generate an estimated 32,000 MW of power at a cost of US\$ 32 billion (SADC, 2008). For example, the Inga III hydropower project being developed along the Congo river is a joint effort of five SADC power utilities (in Angola, Botswana, DRC, Namibia, South Africa) that have formed the Western Power Corridor Company (Westcor) registered in Botswana. The US\$ 8 billion

¹¹ An overview for 2007-08 is available at www.sadcreview.com/pdfs07/IS2007_08.pdf

¹² On data gathering, see <http://sadchycos.dwaf.gov.za/>

project intends to develop 4300 MW of power through run-of-river technology with "zero environmental impact".¹³

Without doubt, there is a desperate need across the region for sustainable supplies of energy, as well as predictable supplies of both treated and untreated bulk water. Consider the following two examples: whereas Zambia accounts for 45% of all southern African water resources, less than 50% of Zambia's predominantly rural population have access to water of sufficient quantity or quality. Second, Zambia has installed capacity of 1,631 MW against demand for approximately 1,200 MW. While the 'surplus' is exported to the region, it is estimated that only 18% of Zambians have access to electricity, woodfuel satisfies 66% of Zambia's total energy demand, and citizens spend approximately 30% of their incomes on fuel (wood, paraffin, charcoal, coal) for cooking (SADC, 2008).¹⁴ There is an extensive actor network in support of the technocentric harnessing of the region's water resources for socio-economic development. Water supply and power generation constitute two linked and important nodes for companies and lending agencies interested in financing the roll-out of infrastructure in support of such things as the Millennium Development Goals (MDGs) and projects under the New Partnership for Africa's Development (NEPAD). They also constitute convenient points of entry for all those actors interested in the so-called "new scramble for Africa's resources" (The Economist, 2008; Eisenman and Kurlantzick, 2006).

Given the shortage of financial, technical and human capital across SADC member-states, donors, multilateral development banks and private companies provide almost all of the capital and most of the technical expertise (SADC, 2005). To cite several examples: the European Union (EU), the Netherlands and the World Bank provided US\$ 800 million for Phase I of Malawi's urban water supply system upgrade programme. Recently, the Africa Catalytic Growth Fund, which is a multi-donor trust fund, granted the government of Malawi US\$ 25 million toward Phase II of the programme. Zambia's Power Rehabilitation Project has attracted funding from the Development Bank of South Africa (DBSA), NORAD and Sida. China's Sinohydro is active across the region, and in 2008 began construction of the Dikgatlong Dam in Botswana. Sweden's SWECO International AB and Euroconsult are active in the Pungwe river Basin project, as are the governments of Italy (feasibility study and construction of large-scale dam), the Netherlands and Germany (credit schemes for rural development). The Mafambisse Sugar Estate Company has also contributed US\$ 2.5 million for construction of a medium-scale dam on one of the Pungwe's tributaries (see www.pungweriver.net). Numerous private banks – e.g. Bank National de Paris; Dresdner; Hill Samuel – and export credit agencies such as Hermes have been active in large water storage and transfer schemes such as the Lesotho Highlands Water Project, the North-South Carrier in Botswana; and the Mphanda Nkuwa Dam in Mozambique. Despite recent claims by the World Bank (2007) that through dam building it is "promoting low carbon economies", it is clear that (public, private, multilateral) banks, private companies, and most government agencies are pursuing a classically high-modern, 'hard path' to water security (Allan's 2nd paradigm).

SADC governments are generally supported by urban and rural, rich and poor citizens alike in most of these water supply projects, despite their widely divergent access to and use of delivered, potable water. It is estimated that while residents of low density urban areas may consume on average 700 litres per person per day (lpd), residents of high-density peri-urban settlements may get by on as little as 10 lpd (Pallett, 1997). Both groups generally wield little influence over government decision making, although residents of low density urban areas are generally better serviced by municipal governments and are more politically engaged as 'citizens' who 'voice' their preferences through such things as ratepayers organisations, the media, and the ballot box. For the most part, residents of high density areas will exercise 'exit' before 'voice', meaning that they will disengage from the system rather than seek out formal redress. Both groups are armed with 'protest power', and have in some instances been

¹³ See the Westcor advert and call for expressions of interest under the Tender and Adverts link at www.sapp.co.zw/viewinfo.cfm?id=59&linkid=2&siteid=1.

¹⁴ For an overview of the Zambia Electricity Supply Company (ZESCO) see www.zesco.co.zm/general-transmission.html.

mobilised by social movements and community organisations protesting against such things as the privatisation of urban water supply (Ruiters and Macdonald, 2005; Bond, 2002). However, where disempowered people's interests clash with the most powerful actors in the region – governments, mining companies, plantation agriculture, businesses, banks – available evidence suggests that they continue to lose out (WCD, 2001). Homer-Dixon (1999) describes this as a process of resource capture (by the empowered) and ecological marginalisation (of the poor).

Ecocentric struggles

In southern Africa, whereas urban struggles for affordable water have been supported by anti-globalisation global social movements and social justice networks all of which are technocentric actor-coalitions, rural peoples' struggles for access to water have been supported by a mix of actors from the global North: INGOs such as World Vision, donor states, mixed-actor networks such as the IUCN, and natural resource focused INGOs, some of which demonstrate strong ecocentric positions. The peculiar nature of state-making, settlement and resource capture throughout the region has led to the confluence of surface water, national parks and protected areas, and disempowered peoples at the borderlands and in the hinterlands of states. Thus, recent technocentric attempts to capture regional water resources for development have run up against the considerable money, knowledge and lobbying power of international conservation organisations, and donor state departments with conservation-oriented mandates.¹⁵

There are also many smaller INGOs active on environmental issues in the region as well – International Rivers Network, the Natural Heritage Institute – but their operating budgets pale in comparison to Conservation International, World Wide Fund for Nature, and The Nature Conservancy (see Chapin, 2004 for details). Nevertheless, they often work in concert with donor governments (e.g. USAID, SIDA, DFID, GTZ), the bigger INGOs, and influential local organisations (e.g. the South Africa-based Peace Parks Foundation; Namibia Nature Foundation) on conservation-oriented projects and programmes (transfrontier conservation areas; river basin management plans) often through global environmental funding channels such as GEF (the Global Environmental Facility) and the UNDP. All of these groups have taken deliberate steps to link support for rural livelihoods and poverty alleviation to nature conservation through stakeholder participation.

Commitments to inclusive processes of stakeholder participation and environmental preservation are now regarded as 'normal' conditionalities placed by donors upon money committed to development projects and programmes. Powerful SADC actors often have no patience with arguments that favour nature and the lifestyles of remote area dwellers over the perceived needs of industrial development. Typifying the extreme of this perspective is Botswana's former Minister of Finance and past President, Festus Mogae, who famously remarked in response to accusations that his government in its continuing effort to exploit the country's diamond wealth was mistreating the Kalahari bushmen: "If the bushmen want to survive, they must change, otherwise, like the dodo, they will perish" (New York Times, 14 July 1996). Namibia's former President Nujoma made similar remarks regarding the Himba whose traditional ways of life are threatened by proposed hydropower developments in the north of the country.

Donor pressure for 'stakeholder participation', therefore, remains a controversial conditionality for most SADC states – except in South Africa and Namibia where successful liberation struggles have initiated progressive approaches to citizen empowerment through water resource access, use and management (Conca, 2006; Amakali and Shixwameni, 2003; Manning and Seely, 2005). Where donors have supported institutional reform at the level of the river basin, stakeholder participation has often

¹⁵ USAID's CARPE (Central African Programme for the Environment) is perhaps the best example of this (see <http://carpe.umd.edu/>), although the European Commission attempts to mainstream the environment throughout all of its SADC regional programming (SADC/EC, 2006). The Canadian Forest Service's 'model forests' programme is another good example (see <http://cfs.nrcan.gc.ca/index/cmfp>).

resulted in local level resource capture by already empowered actors such as commercial farmers, non-involvement of important resource users who have secured their own bulk water supply privately or directly through the central state, and local level conflicts (Dube and Swatuk, 2002; Tapela, 2008).

Most of these actors are not one-dimensional entities, however. Through time all stakeholders in the region have been influenced by global discourses on development and environment and, in some cases, have been able to successfully manipulate global actors to their own ends as much as they themselves have been manipulated. For example, most SADC states are party to the world's major environmental protocols, conventions and agreements. These have also informed the character and content of various regional protocols and conventions (SADC/EC, 2006). SADC Ministers for the Environment and Water Resources have hammered out common African positions through the African Union's inter-ministerial summits, often in preparation for issue specific – climate change, freshwater, sustainable development – global summits. Extensive educational programmes with EU, American, Canadian and Australian tertiary institutions have resulted in numerous water professionals all being trained in IWRM. SADC state policies, laws and institutions are all being revised in light of IWRM (Swatuk, 2002, 2005a), often in direct response to legal and institutional developments in donor states (e.g. the EU Water Directive), with the ultimate goal being a regional harmonised legal framework (SADC, n.d.). There are many people active in SADC government departments and across SADC states that support such reforms, with the regional M.Sc. in IWRM training a new cohort of water professionals all interested in more equitable, efficient and ecologically sustainable water management (Swatuk, 2005a). Thus, aspects of the ecocentric argument are accepted and in-built into government decision-making processes, even where preferences are for technocentric outcomes.

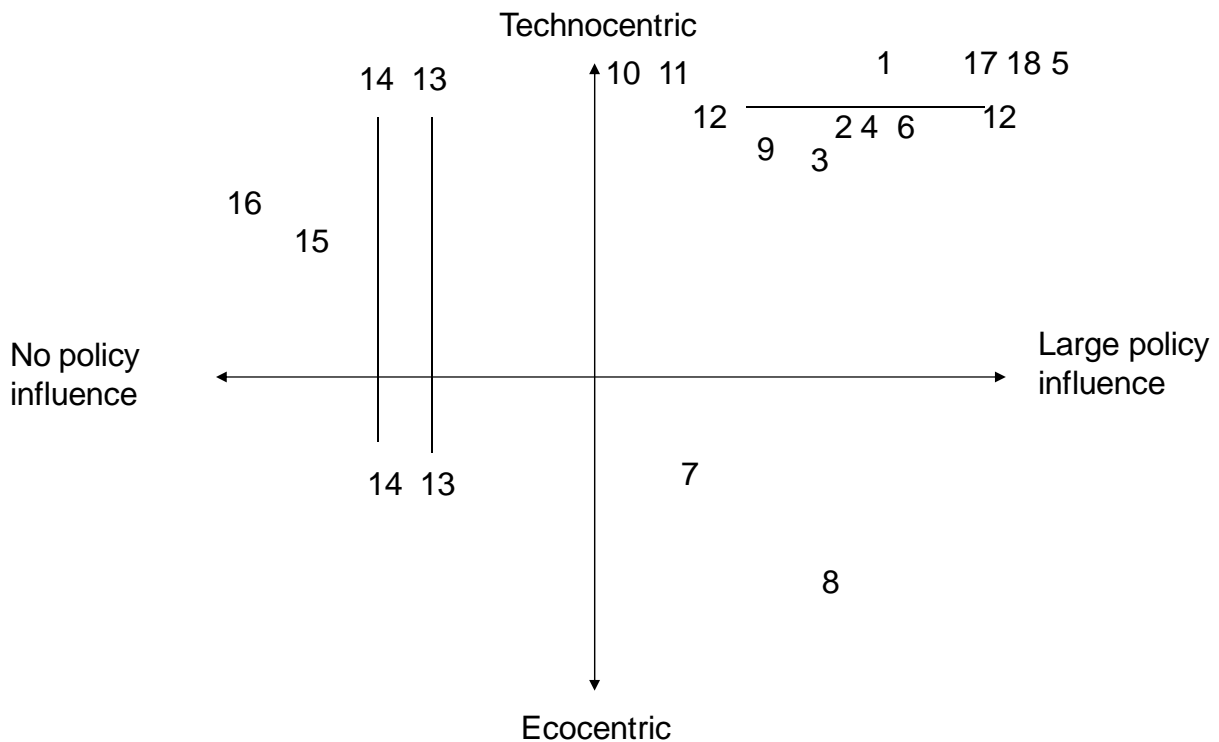
Perhaps the best example of ideological struggle over resource management in the region is the Okavango Delta Management Plan (ODMP), a Government of Botswana project jointly funded by the IUCN, Sida and the Government of Botswana and managed by the ODMP Secretariat through Botswana's Department of Environmental Affairs. The project stems from Botswana's obligations as a signatory to the Ramsar Convention on Wetlands of International Importance, and as part of its commitment (along with fellow riparians Angola and Namibia) to an overall development plan for the Okavango river basin. In line with its ecocentric preferences, the IUCN set the project within a holistic 'ecosystem approach' to planning and management (Jansen and Madzwamuse, 2003). It also identified local people dependent upon the river basin for their livelihood as 'primary stakeholders', in contrast to government departments identified as 'key stakeholders'. Following Ramsar guidelines, inhabited wetlands must centrally involve primary stakeholders in the planning and implementation processes. The Government of Sweden through Sida has also supported participation in the planning process through its continued support of the 'Every River Has its People' project, a community-focused outreach endeavour, and the Basin Wide Forum, now formally incorporated into the Okavango River Basin Commission (Okacom) (see www.okacom.org/structure.htm). Sida has also provided US\$ 2.2 million for the establishment of the Okacom Secretariat in the Okavango delta town of Maun. In theory, it would appear that a management plan based on the wise use of the lower Okavango river basin is possible (Turpie et al., 2006).

In practice, however, Botswana government departments have resisted any moves toward integration – even knowledge sharing – and have stuck firmly to their bureaucratic 'silo' approach and technocentric development plans (Swatuk, 2005b). In-building 'stakeholder participation' has also revealed numerous sticking points among various actors in the Delta – for example between indigenous subsistence fishers and foreign tour operators (Kgomotso and Swatuk, 2006). Actors do not line up as Allan suggests – between a 2nd paradigm South and a 5th paradigm North. Rather, there are different coalitions of North-South actors lined up around the various issues (table 1). For example, with the IUCN and SIDA promoting 'poverty alleviation' for remote area dwellers, there is a coalition here among donors, the ODMP secretariat, international NGOs, local NGOs, most of the scientific research community in Botswana, and remote rural area residents interested in community based natural resources management. On the other hand, there is a coalition of interests among tour operators,

residents of the large towns and other government actors. Tourism revenues are increasingly important to Botswana Gross National Income, influential citizens of Botswana sit on the Boards of Directors of most of these enterprises, and many local people are employed in tourism activities, so government is reluctant to follow-up on accusations of resource capture by tour operators and ecological marginalisation of subsistence actors. Each of these coalitions trade on the 'pristine ecosystem' narrative that surrounds the Okavango Delta (Pinheiro et al., 2003). However, the former takes a firm ecocentric position wherein local people are 'preserved' as 'ecosystem people', while the latter regards the Delta as an important driver of economic development, so managing its wildness for technocentric ends. One can also identify a third, extreme technocentric coalition of interests – cattle farmers, industry, some urban residents – who question the very existence of the Delta as a "playground for hippos, crocodiles, and fish hawks" (Wellington, 1949), and would like to see dramatic changes in favour of human settlement.¹⁶

The ecocentric approach remains both less influential in decision-making circles and less appealing to the vast majority of people across the region than the technocentric approach, primarily because the hard path to water development is generally believed to facilitate economic development and so deliver jobs, votes, money, influence and power. However, the limited number of actors on the ecocentric side of the spectrum (figure 1) wield considerable obstructive power where water resource infrastructure development is concerned. As shown in the Okavango case above, these interlinked actors are able to effectively stall technocentric plans in favour of the status quo with 'more studies' being the compromise position.

Figure 1. Stakeholders on the techno-ecocentric scale



¹⁶ Over the course of a multi-year research project conducted in the Boteti river sub-basin, an often heard complaint made by residents there is that government refuses to bring them water from the Delta.

This does not mean that even the most extreme technocentric position will lose out permanently. Indeed, SADC has endorsed as a regional priority project a feasibility study that examines the possibility of transferring water from the Congo headwaters into the Okavango river system so possibly "greening the desert" (Ngurare, 2001) and fundamentally altering the character of the Delta. Both Angolan and Namibian officials continue to argue that they will use more water from the Okavango as is their sovereign right (Pinheiro et al., 2003). This may include a number of dams upstream in Angola, irrigation projects in both Angola and Namibia, and water transfer to Namibia's arid but heavily populated central district. Even the Government of Botswana has only "suspended", not cancelled, an earlier plan to transfer water out of the Delta in response to heavy local and global opposition (Swatuk, 2003).

Table 8. 'Stakeholders' and the inter-paradigm debate on water in southern Africa

Actor	Influence	Position	Interest	Example
1. Central Government	Primary decision-making power	Paradigm 2 with pockets of 3-5	Economic growth; employment creation; environmental sustainability; access to markets	National Development Plans
2. Departments/Ministries of Water Affairs	Secondary decision-making power	Paradigm 2 with pockets of 3-5	Sustainable water supply; 'some for all for ever'; quality control; contribute to national development	Inter-basin transfers, dam development, Water Efficiency Plans, WDM, Water Conservation Desk
3. Departments/Ministries of Environmental Affairs, Wildlife, Tourism, National Parks, Forestry	Secondary decision-making power	Paradigm 5 with pockets of 2-4	Healthy environment; environmental flow; contribute to national development	Membership of IUCN, Ramsar Convention, CCD, CBD
4. Departments/Ministries of Industry, Trade, Finance, Development, Land and Housing, Agriculture, Municipal government	Secondary decision-making power	Paradigm 2 with pockets of 3-5	Economic growth; job creation; maintain budgetary allocations; service delivery	SADC protocols on trade, industry, telecommunications, etc.; National and District development plans
5. Mogae, Nujoma, most SADC presidents	Primary decision-making power	Paradigm 2	Improved national HDI; security; self-interest	'change or go the way of the dodo', 'green the desert'
6. SADC Water Division	Primary decision-making power	Paradigm 2 with pockets of 3-5	Water to support infrastructure development; infrastructure to support hydraulic mission	IWRDM
7. International Networks: e.g. GWP, CapNet, WaterNET	Knowledge-based power	Paradigm 5 with pockets of 3,4	Water efficiency; Gender mainstreaming; conflict resolution; 'governance'	IWRM

8. IUCN, Conservation International, WWF plus national NGO partners	Lobbying power/ money power	Paradigm 3, 5	'ecosystems approach'; biological hotspots	CBNRM, TBNRM, peace parks
9. Donor: EU, SIDA, USAID, China	Knowledge-based power/ money power	Paradigm 5, with pockets of 2-4	Support donor objectives	EU Water Directive, Gender Mainstreaming, WDM, dam and pipeline building; CIDA 'model forests'; USAID CARPE; Angola Telecomms
10. Private companies (e.g. SWECO International AB; Euroconsult; Sinohydro)	Money power	Paradigm 2	profit	Lesotho Highlands; Pungwe Gorge; Kafue Gorge power station; urban water supply
11. Private banks (e.g. Bank National de Paris; Dresdner; Hill Samuel) and export credit agencies (e.g. Hermes)	Money power	Paradigm 2	profit	Lesotho Highlands; North-South Carrier; Mphanda Nkuwa Dam
12. Multilateral banks (e.g. World Bank, African Development Bank)	Money power/ knowledge-based power	Paradigm 2 with claims to 3,4,5	Profit and influence	World Commission on Dams; US\$50 billion for 500 dams in 92 countries
13. Resident of urban area (e.g. primary or secondary city), low density	Tax payer/ voice before exit/ engagement	Paradigm 2-5	Water for household use, water for business, water for nature	700 litres/day for household use; vote power; protest power; self-help
14. Resident of urban area (e.g. primary or secondary city), high density	Tax payer or squatter/ exit before voice	Paradigm 2-5	Water for household use, water for small business	As little as 10 litres/day for household use; protest power
15. Resident of fast growing peri-urban area (e.g. Maun, Mzuzu, Okahandja)	Limited power beyond immediate resource base	Paradigm 2	Water for household use, water for livestock, water for small business	Protest over fee hikes or introduction of fees; access through new 'stakeholders' approach
16. Resident of remote rural area	Recipient of decisions	Paradigm 1 with pockets of 2	Water for survival, water for live-stock/crops	Access through new 'stakeholders' approach
17. Mining/Industry	GDP power	Paradigm 2 with pockets of 3-5	Industrial water; water for mining towns	Inter-basin transfer schemes; private water supply
18. Commercial farms	GDP power	Paradigm 2 with pockets of 3-5	Virtual water; water for households	Dams; canals; boreholes; private water supply

Much has been made of the region's progress on transboundary water management, particularly in the creation of river basin commissions (Heyns, 2003), none of which involved broad-based stakeholder dialogue. Spurred on by a narrative of peace-building and regional economic integration, donor support for inter-state water resource institution building seems to be having a dual impact. First, it reinforces the power of already empowered actors through high-level government processes. Second, it seems to have galvanised an empowered actor network around infrastructure development. This is clearly articulated in the SADC *RSAP*, leading several observers to hypothesise that a "new dam building era" is dawning in the region (see, Confluence, 2004; also, <http://internationalrivers.org/en/node/1757>). The absence of broad-based participation seems not to be regarded as a problem by donors. Perhaps it is

not, at least where large-scale multi-purpose dams stand to have broad-based socio-economic benefits as appears to be the case with most of the planned infrastructure projects in Mozambique (see above).

CONCLUSION

Southern Africa is a battleground of underdevelopment (Freund, 1998, Boege, 2008). How water resources have been allocated, used and managed in the region reflects this fact: well-watered gated communities reside alongside sprawling under-serviced townships, themselves ringed by squatter camps. Extensive irrigated fields of sugar cane, cotton and tea are worked by people whose own small plots of land often fail to yield enough food to feed their own families. Wildlife and cattle compete for the same grazing lands around perennial and ephemeral rivers, creating unforgettable experiences for foreign tourists and frustration for local smallholders. Mine-owners strike their own water bargains with government officials and ignore the new catchment councils, industries pollute with impunity and threaten to move to another country should government crack down on them. Cash-strapped municipalities are enticed by 'smart partnerships' with foreign companies, and central governments use scarce resources to train new water professionals only to watch them brain drain away. And while the entire region suffers drought and flood, its people do not suffer equally: while many will die with their livestock, others will simply fly away.

Southern Africa's states internally are politically divided, socially unequal, economically undiversified, and environmentally degraded. Social and physical water scarcity deepens these conditions. This is a difficult landscape for water reforms. In my view, those committed to IWRM's 'triple e' must be more strategic in their approach to changing unsustainable, inefficient and inequitable forms of water use. Certain aspects of reform have yielded more benefits than have others and these are areas to be exploited. For example, SADC governments have generally supported the creation of cooperative, inter-state, transboundary water commissions. Supporters of IWRM must continue to press for their deliberations to be as open and inclusive as possible. Other aspects of the IWRM-inspired reform process have met with resistance or have been hijacked by political events, in particular the new institutional structure based on catchments agencies. The wisdom of introducing new sites of power and influence into an already crowded and unlevel playing field should be revisited (Van der Zaag, 2005). On-going dialogues – pushed by a combination of interests internal and external to the region – force state-makers to refine their objectives and to reframe their methods of water allocation and use along more sustainable lines. In some cases, this new thinking is reflected in national water master plans and new water acts. Externally funded and regionally supported education, training, and awareness programmes are creating a region-wide professional and managerial class interested in 'water for all for ever' and should be supported and enhanced. Bold and capable leadership in South Africa and Namibia have taken big steps toward the depoliticisation of household water. One can envision a time in the near future when having access to water of sufficient quality and quantity for personal use will not be determined by race or class. Achieving 'critical mass' for deliberate action is not an easy thing in deeply divided societies – Namibia and South Africa are somewhat exceptional in that both governments are still fueled by post-liberation (somewhat) populist developmental agendas. Yet, even there – as elsewhere in the region – the neo-liberal strictures of less government/more private sector make it exceedingly difficult to undertake large-scale reforms (e.g. land reform, urban renewal) not because they are profitable but because they are right (Bond, 2002; Mittelman, 1996). Where there does seem to be scope for widespread benefit sharing – rural, urban, local, regional – is in infrastructure development, in particular dam building and water transfer schemes. SADC members recognise this fact; indeed, by folding the Water Division into the Directorate of Infrastructure and Services they have placed water within development, not apart from it. This observation will no doubt raise the ire of the 'anti-dam' community, but it does seem to support both Allan's observation that the South is determined to continue with its hydraulic mission, and my own observations regarding the social power that clusters around technocentric approaches to water. A challenge for supporters of IWRM is not to

resist technocentric 'hard paths' to water management, but to ensure that benefits from these activities – social and environmental as well as economic – are spread as widely as possible. This will necessitate a shift away from ecocentric discourses that play well across the industrialised global North, toward acceptance of a modified, late-modern 'hydraulic mission' in southern Africa.

ACKNOWLEDGEMENTS

The author wishes to thank three reviewers and the editors for their helpful suggestions and insightful remarks. The author would also like to dedicate this piece of work to the memory and spirit of the late Dr Jerry Ndamba.

BIBLIOGRAPHY

- Allan, J.A. 2003. IWRM/IWRAM: A new sanctioned discourse? Discussion Paper No.50. Water Issues Study Group, University of London.
- Amakali, M. and Shixwameni, L. 2003. River basin management in Namibia, *Physics and Chemistry of the Earth* 28(20-27): 1055-1062
- Anglin, D.G. 1983. Economic liberation and regional cooperation in southern Africa: SADC and PTA. *International Organisation* 37(4): 681-711.
- Bate, R. and Tren, R. 2002. *The cost of free water: The global problem of water misallocation and the case of South Africa*. Sandton: Free Market Foundation.
- Bell, C. 2006. The long-run economic costs of AIDS: A model with an application to South Africa. *The World Bank Economic Review* 20(1): 55-89.
- Boege, V. 2008. Transboundary water governance in regions of weak statehood. In Swatuk, L.A. and Wirkus, L. (Eds), *Transboundary water governance in southern Africa*. Berlin, Nomos. Forthcoming.
- Bond, P. 2006. *Looting Africa: The economics of exploitation*. London: Zed Press.
- Bond, P. 2002. *Unsustainable South Africa: Environment, development and social protest*. London: Merlin Press.
- Biswas, A. 2004. Integrated water resources management: A reassessment. *Water International* 29(2): 248-256.
- Callaghy, T. and Ravenhill, L. 1993. *Hemmed in: Responses to Africa's economic decline*. New York: Columbia University Press.
- Chapin, M., 2004. A challenge to conservationists. *World Watch Magazine*, November/December, 17-31.
- Chenje, M., and Johnson, P. (Eds). 1996. *Water in southern Africa*. Harare/Maseru: Southern African Development Community/Southern African Research and Documentation Centre/World Conservation Union.
- Conca, K. 2006. *Governing water. Contentious transnational politics and global institution building*. Cambridge, Mass: MIT Press.
- Confluence* (newsletter of the UNEP Dams and Development Project). January-December 2004, issues 5-6.
- Conley, A. 1996. A synoptic view of water in southern Africa. In Solomon, H. (Ed), *Sink or swim? Water, resource security and state cooperation*. IDP Monograph Series No.6. Pretoria: Institute for Defence Policy.
- Cox, R.W. 1987. *Production, power and world order: Social forces in the making of history*. Cambridge: Cambridge University Press.
- Crosby, A.W. 1986. *Ecological imperialism: The biological expansion of Europe, 900-1900*. Oxford: Oxford University Press.
- Cullis, J. and van Koppen, B. 2008. Applying the Gini coefficient to measure inequality of water use in the Olifants river water management area, South Africa. In Swatuk, L.A. and Wirkus, L. (Eds), *Transboundary water governance in southern Africa*. Berlin: Nomos. Forthcoming.
- Denoon, D., with Nyeko, B. 1972. *Southern Africa since 1800*. London: Longman.
- Dube, D. and Swatuk, L.A. 2002. Stakeholder participation in the new water management approach: A case study of the Save river basin, Zimbabwe. *Physics and Chemistry of the Earth* 27(11-22): 867-874.
- Eisenman, J. and Kurlantzick, J. 2006. China's Africa Strategy. *Current History* (May): 219-224.
- Falkenmark, M., and Rockstrom, J. 2004. *Balancing water for humans and nature*. London: Earthscan.
- Feinstein, C.H. 2005. *An economic history of South Africa: Conquest, discrimination and development*. Cambridge: Cambridge University Press.
- Freund, B. 1998. *The making of contemporary Africa*. Boulder: Lynne Rienner.

- Gereffi, G. and Wyman, D.L. (Eds). 1990. *Manufacturing miracles: Paths of industrialization in Latin America and East Asia*. Princeton: Princeton University Press.
- GWP (Global Water Partnership). 2000. *Integrated water resources management. TAC Background Papers, No.4*. Stockholm, Sweden: Global Water Partnership.
- Gumbo, B. and Van der Zaag, P. 2002. Water losses and the political constraints to demand management: The case of the city of Mutare, Zimbabwe. *Physics and Chemistry of the Earth* 27(11-22): 805-814.
- Hajer, M. 1995. *The politics of environmental discourse: Ecological modernisation and the policy process*. Oxford: Oxford University Press.
- Hayward, T. 1995. *Ecological thought*. Cambridge: Polity Press.
- Herbst, J. 2000. *States and power in Africa: Comparative lessons in authority and control*. Princeton: Princeton University Press.
- Heyns, P. 2003. Water resources management in southern Africa. In Nakayama, M. (Ed), *International waters in southern Africa*, pp. 5-37. Tokyo: United Nations University.
- Homer-Dixon, T. 1999. *The environment, scarcity and violence*. Princeton: Princeton University Press.
- Jansen, R. and Madzwamuse, M. 2003. The Okavango delta management plan: The need for environmental partnerships. In Turton, A.R.; Ashton, P. and Cloete, E. (Eds), *Transboundary rivers, sovereignty and development: Hydropolitical drivers in the Okavango river basin*, pp. 141-166. Pretoria and Geneva: AWIRU and Green Cross International.
- Kgomotso, P. and Swatuk, L.A. 2006. Access to water and related resources in Ngamiland, Botswana: Toward a more critical perspective and sustainable approach. *Physics and Chemistry of the Earth* 31(15-16): 659-668.
- Klaphake, A. and Scheumann, W. 2008. Understanding transboundary water cooperation: Evidence from southern Africa. In Swatuk, L.A. and Wirkus, L. (Eds), *Transboundary water governance in southern Africa*. Berlin: Nomos. Forthcoming.
- Kuhn, T. 1962. *The Structure of scientific revolutions*. Chicago: University of Chicago Press.
- Maganga, F. 2003. Incorporating customary laws in implementation of IWRM: Some insights from the Rufiji River Basin, Tanzania. *Physics and Chemistry of the Earth* 28(20-27): 995-1000.
- Makgetla, N. and Seidman, A. 1980. *Outposts of monopoly capitalism: Southern Africa in the changing global economy*. Westport, Conn: Lawrence Hill.
- Manning, N. and Seely, M. 2005. Forum for integrated resource management (FIRM) in ephemeral basins: Putting communities at the centre of the basin management process. *Physics and Chemistry of the Earth* 30(11-16): 886-893.
- Mazrui, Ali. 1986. *The Africans: A triple heritage*. Boston: Little Brown and Co.
- Merrey, D.G. 2008. Is normative IWRM possible? *Physics and Chemistry of the Earth*, 33 (pre-publication draft).
- Mittelman, J.H. (Ed). 1996. *Globalization: Critical reflections*. Boulder: Lynne Rienner.
- Mittelman, J.H. 1988. *Out from underdevelopment: Prospects for the Third World*. London: Macmillan.
- Moyo, S.; O'Keefe, P. and Sill, M. (Eds). 1993. *The southern African environment*. London: Earthscan.
- Ngurare, T.E. 2001. Legal and institutional implications of cross-border water pipelines in international law: The Congo cross-border water pipeline project (CWPP) case study. *CEPMLP Annual Review – Article 10*. www.dundee.ac.uk/cepmlp/car/html/car5arti10.htm
- O'Meara, D. 1996. *Forty lost years: The apartheid state and the politics of the National Party, 1948-1994*. Johannesburg: Ravan.
- Pallett, J. (Ed). 1997. *Sharing water in southern Africa*. Windhoek: Desert Research Foundation of Namibia.
- Pettman, R. 1979. *State and class: A sociology of international affairs*. London: Croom Helm.
- Pinheiro, I.; Gabaake, G. and Heyns, P. 2003. Cooperation in the Okavango River basin: The OKACOM experience. In Turton, A.R.; Ashton, P. and Cloete, E. (Eds), *Transboundary rivers, sovereignty and development: Hydropolitical drivers in the Okavango river basin*, pp. 105-118. Pretoria and Geneva: AWIRU and Green Cross International.
- Postel, S. 1999. *Pillar of sand: Can the irrigation miracle last?* Washington, DC: Worldwatch Institute.
- Reisner, M. 1993. *Cadillac desert*. Harmondsworth, UK: Penguin.
- Ruiters, G. and Macdonald, D. (Eds). 2005. *The age of commodity: Water and privatization in southern Africa*. London: Earthscan.
- SADC (Southern African Development Community). n.d. *Regional indicative strategic development plan*. Gaborone: SADC.
- SADC. 2008. *The official SADC trade, industry and investment review, 2007/08*. Gaborone: Southern African Development Community.

- SADC. 2005. *Regional strategic action plan on integrated water resources development and management*. Gaborone: Southern African Development Community.
- SADC/EC. 2006. *Environmental analysis for regional strategy paper. Background briefing paper for the SADC-EC 10th European Development Fund Regional Strategy Paper* (July). Gaborone: Southern African Development Community/European Union.
- Sokile, C., and Van Koppen, B. 2004. Local water rights and local water use entities: The unsung heroines of water resources management in Tanzania. *Physics and Chemistry of the Earth* 29(15-18): 1349-1356.
- Soderbaum, F. 2004. *The political economy of regionalism: The case of southern Africa*. Basingstoke: Palgrave.
- Steel, E.A. 1917. Zambia-Congo watershed. *The Geographical Journal* 50(3): 180-93.
- Swatuk, L.A. 2005a. Political challenges to implementing IWRM in southern Africa. *Physics and Chemistry of the Earth* 30(11-16): 872-880.
- Swatuk, L.A. 2005b. Whose values matter most? Water and resource governance in the Okavango River Basin. In Demuth, S. and Croll, P. (Eds), *The Value of water – different approaches in transboundary water management*, pp. 57-70. Bonn and Koblenz: BICC and IHP/HWRP.
- Swatuk, L.A. 2003. State interests and multilateral cooperation: Thinking strategically about achieving 'wise use' of the Okavango delta system. *Physics and Chemistry of the Earth* 28(20-27): 897-906.
- Swatuk, L.A. 2002. The new water architecture in southern Africa: Reflections on current trends in light of Rio +10. *International Affairs* 78(3): 507-30.
- Swatuk, L.A. 2000. South Africa in the region: 'Botha would be proud'. *Southern Africa Report Archive* 15(3): 3 pages. www.africafiles.org/article.asp?ID=3647
- Swatuk, L.A. and Shaw, T.M. (Eds). 1994. *The South at the end of the twentieth century*. London: Macmillan.
- Tapela, B.N. 2008. Stakeholder participation in the transboundary management of the Pungwe river basin. In Swatuk L.A. and Wirkus, L. (Eds), *Transboundary water governance in southern africa*. Berlin: Nomos.
- The Economist. 2008. A ravenous dragon. March 15-21, special report on China's quest for resources.
- Turpie, J.; Barnes, J.; Arntzen, J.; Nherera, B.; Lange, G.-M. and Buzwani, B. 2006. *Economic value of the Okavango delta, Botswana and implications for management*. Gaborone: Republic of Botswana.
- Turton, A.R.; Schultz, C.; Buckle, H.; Kgomongoe, M.; Malungani, T. and Drackner, M. 2006. Gold, scorched earth and water: The hydropolitics of Johannesburg. *Water Resources Development* 22(2): 313-335.
- United Nations (UN). 2006. *Water a shared responsibility. The United Nations World Water Development Report 2*. UNESCO and Berghahn Books: France and New York.
- UNDP. 2008. *Human Development Report*. New York: Oxford.
- UNDP. 2006. *Human Development Report*. New York: Oxford.
- UNESCO. 1974. *To reach the village. UNESCO in action*. www.unesdoc.unesco.org/images/0001/000115/011500_eo.pdf (accessed 20 May 2008)
- Van der Zaag, P. 2005. Integrated water resources management: Relevant concept or irrelevant buzzword? A capacity building and research agenda for southern Africa. *Physics and Chemistry of the Earth* 30(11-16): 867-871.
- Van der Zaag, P. and Bolding, A. 2008. Water governance in the Pungwe river basin: Institutional limits to the upscaling of hydraulic infrastructure. In Swatuk, L.A. and Wirkus, L. (Eds), *Transboundary water governance in southern Africa*. Berlin: Nomos.
- Wellington, J.H. 1949. Zambezi-Okovango development projects. *Geographical Review* 39(4): 552-67.
- Wongibe, E. 2002. Land reform and poverty eradication in Africa. Towards a new agricultural paradigm. *Development and Cooperation* 2 (March-April): 19-20.
- World Bank. 2008. *World Development Report*. Washington, DC: World Bank.
- World Bank, 2007. *Accelerating the transition to a low carbon economy*. Washington, DC: World Bank.
- WCD (World Commission on Dams). 2001. *Dams and development: A new framework for decision-making*. London: Earthscan.