

**SECURITY, ECOLOGY, COMMUNITY: CONTESTING THE 'WATER
WARS' HYPOTHESIS IN SOUTHERN AFRICA**

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AVAILABILITY OF FULL REPORT

The full report on CD-Rom may be obtained on request from the Water Research Commission.

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EXECUTIVE SUMMARY

1 Introduction

The needs of ecological and political systems often conflict. This is especially so in a region like Southern Africa where state-creation ignored ecosystems and historical patterns of human settlement in the establishment of political boundaries. In several cases, major river systems served as a convenient means to demarcate new states. In a number of other cases, the lines drawn on a map out of colonial political consideration split river basins between upstream and downstream countries. As a result, the SADC region has fifteen international river basins. Water resources management today is therefore often a matter of international politics.

2 Water Wars

Ten years ago Ismael Serageldin of the World Bank stated ‘the wars of the next century will be over water’ (quoted in African Development Bank, 1994: 39). About the same time, Yeld (1993: 33) speculated that South Africa ‘will experience the equivalent of permanent drought somewhere between 2002 and 2040. Water rationing is likely to become a fact of life.’ A few years later, Conley (1996: 19) stated, ‘South Africa at present represents an example of a country which has reached a stage in its development where its scarce water resources will have to be allocated increasingly to the most worthwhile purposes only. It has become necessary for each water use to warrant the cost of providing the water.’ In 1997, Pallett and others, using a simple formula devised by Falkenmark (1986), and based largely on the relationship between increasing population growth and finite amounts of blue water, presented a graph illustrating how ‘water stress’ would grow to ‘absolute water scarcity’ in most of the SADC region.

Policymakers in the region, taking their cues from international scholarship (Homer-Dixon, 1991, 1994) and popular opinion (Kaplan, 1994), framed water resources management within a discourse of state security and inter-state vulnerability. Hence, sovereign states acting independently to secure water supplies presented the possibility for increased conflict over water resources in the future (Ohlsson, 1995; SIDA, 1997). Moreover, it was hypothesised that global climate change, population increase, and limited renewable and non-renewable resources, constituted a volatile brew where inter- and intra-state conflict – i.e. ‘water wars’ – could become manifest in the near future (Solomon, 1996; Solomon and Turton, 2000; Turton and Warner, 2001).

Our project was conceived as a direct challenge to these assumptions. Indeed, a major goal of the theoretical component of our project was to try and change the language being used to talk about water resources management: away from water wars and acute conflict probability toward water for peace and environmental peacemaking. Over the last five years, one can detect a slight shift in the discourse away from the former toward the latter, both in the region (Swatuk, 2002; Turton, Ashton and Cloete, 2003; Nakayama, 2003) and at global level (Conca and Dabelko, 2002; Asmal, 2001; Wolf, Stahl and Macomber, 2003).

New Theoretical Frameworks

Ultimately, what we argue for are new ways of thinking about water resources – first and foremost as a tool for peace and a platform upon which to build wider national and regional cooperation. Without doubt, the theoretical framework and the language used to articulate it matter a great deal (Allan, 2003b).

This report presents the findings from three case studies – institutional reform, urban water supply, food security – and locates them within the emerging discourse of river basin security. River basin security is, in our estimation, informed by the related discourses of integrated water resources management (IWRM) and integrated river basin management (IRBM). A working definition of IWRM is, ‘a process which promotes the coordinated development and management of water, land and related resources, in order to maximise the resultant economic and social welfare in an equitable manner without compromising the sustainability of vital ecosystems’ (GWP, 1998). River basin security combines IWRM with the goals of human security, as articulated by the UNDP (1994). Without going into much detail, let it suffice to say that ‘human security’ has two main aspects. ‘It means, first, safety from such chronic threats as hunger, disease, and repression. And second, it means protection from sudden and hurtful disruptions in the patterns of daily life – whether in homes, in jobs or in communities’ (UNDP in Conca and Dabelko, 1998: 300; see, also, Thomas, 1999: 3-8). The Stockholm International Water Institute (SIWI, 2003: 6), articulates the overall goal of ‘drainage basin security’ as follows:

Water’s many parallel functions in both the life support system and in human society, combined with close linkages between water, food, economic and environmental security, necessitates that a water-related policy is developed around the idea of drainage basin security. Such a policy is imperative to assure security for all water-dependent activities in a river basin and for the ecosystems providing essential ecological goods and services. A policy would aid reconciliation of conflicting interests, development of methods that focus on basin-wide hydrosolidarity, and elaboration of effective and realistic trade offs between competing water-related interests. Since water is a mobile link in the mixed mosaic of water uses, land use and ecosystems, integrated water resources management offers a roadmap toward compatibility.

It is hoped that the findings of this project contribute to both the form and spirit of this goal.

3 Rationale

The rationale for the project derived from the cognitive dissonance shared by the research team between the near global claims over ‘water wars’ and environmentally-induced ‘coming anarchies’ and the evidence on the ground – the ground, in our case, being Southern Africa.

Clearly, environmental problems in Southern Africa are legion, as are problems with water resources management. Most of these, however, are the result of a global history of development and underdevelopment – a global history of which, in a variety of ways, Southern Africa has been an integral part for many centuries. The consequences of this history in the region are poverty and marginalisation for the many, wealth and power for the few (SADC, 2000). Surely, then, environmental problems – including water resources management – form part of a long-term developmental agenda. Locating water resources management within the state-centric discourse of ‘security’ – of war, peace and the control of resources – is, in our estimation a fundamental mistake (Swatuk and Vale, 2001).

4 Theoretical and Case Studies

The project pursued a two-track approach to contesting the water wars hypothesis. Track one involved the writing of a number of theoretical papers that engaged with the regional and global intellectual and policymaking community. While some details of track one are presented in the body of this report, all of these papers have been published and are in the public domain (e.g. Swatuk and Vale, 2000; Swatuk, 2002; Swatuk 2003a; Swatuk 2003b; Thompson, 2002; Thompson and Swatuk, 2001).

Track two involved several empirical case studies linking theoretical arguments with evidence on the ground. The case studies undertaken are as follows:

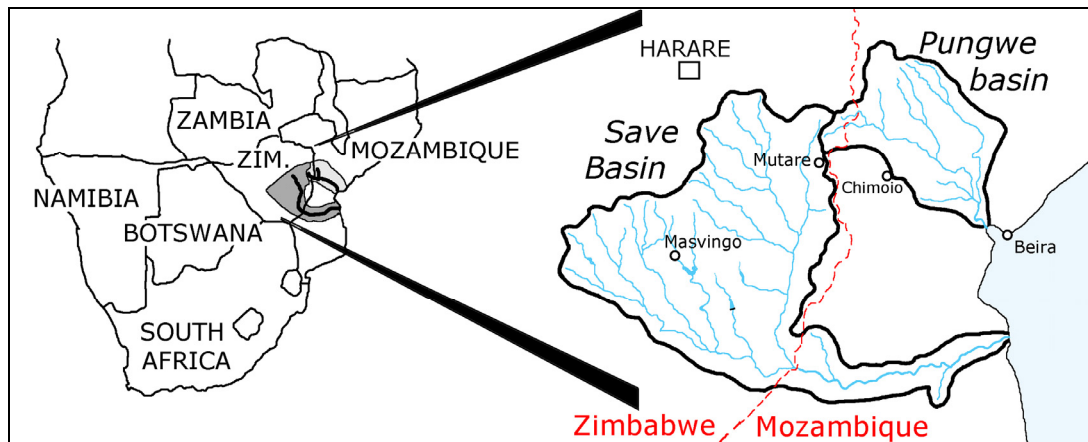
- Institutional reform in water resources management, including a focus on stakeholder participation
- Augmented water supply strategies for urban security
- Urban agriculture as a household strategy for food security

These case studies were buttressed by desktop studies of on-going water resources management strategies in the SADC region (Swatuk 2002; Swatuk and Van der Zaag, 2003). All of these were further supported by complementary research undertaken by University of Zimbabwe students active in the study area (e.g. Gumbo and Van der Zaag, 2002; Manzungu, 2003).

5 Study Area

The study was carried out in the Pungwe/Save River basins of Zimbabwe and Mozambique (See Map 1). The two river basins are adjacent to but distinct from each other; they are, however, conjoined through the Pungwe-Mutare pipeline project, which brings a fixed amount of water (700 litres/second, or 0.7 m³/second, equal to 22 million m³/year) from the headwaters of the Pungwe River via a 79 km gravity-based network of tunnel, pipe and canalworks to the City of Mutare. The Pungwe River,

initially considered part of the Mazowe River catchment area (which drains northward into the Zambezi River), was designated part of the Save River Catchment Council for administrative purposes. However, it neither naturally drains northward into the Zambezi nor southward into the Save (Nilsson and Shela, 1998).



MAP 1: PUNGWE/SAVE RIVER BASINS

These basins were chosen for a variety of reasons:

- All dominant forms of water resources use are present (large urban, peri-urban, mining, large and small agriculture, national parks, tourism)
- An operational inter-basin water transfer scheme is in place in the upper reaches of the Pungwe River catchment (the Pungwe Water Supply Project). This project diverts 0.7 m³/s from the Pungwe River to the City of Mutare which lies in the Save River catchment area
- A variety of real and potential resource use conflicts were pre-identified (between, for example, upstream and downstream users, rural and urban, intra-urban, intra-rural, commercial and smallholder agriculture)
- A variety of new attempts at peacefully managing the resource, including a new Water Act (1998) and new institutional forms (Catchment Councils) were newly in place
- Water resource availability is highly varied throughout the two Basins, subject to both geography and a climate characteristic of wet/dry cycles and recurrent drought and flood

Several key assumptions and working hypotheses underpinned our study:

- Exploitable water resources in Southern Africa are finite
- The region is characterised by relative water abundance but socially-constructed scarcities
- Conflicts over water resource allocation and usage are likely in future
- It is unlikely that these conflicts will lead to 'war'
- It is necessary to determine appropriate mechanisms for sharing the region's water resources
- The 'water wars' discourse may impair creative thinking regarding ways of sustainably managing the region's water resources

- It is therefore necessary to explore other ways of thinking about the causes and consequences of past, present and future natural resources use, particularly water
- These alternative ways of thinking should be grounded both theoretically and empirically

Thus we asked, among other things: What does ‘security’ mean here? For whom? Are these basins likely to give rise to water wars and/or subnational forms of conflict? If so, how might these be best alleviated to ensure long-term sustainable use?

6 Background to the Case Studies

Several points should be noted with regard to the context within which the case studies were undertaken. First, the colonial legacy of water resources development privileged certain actors and interests over others. Second, policy making in the post-colonial period did not seek to undo these privileges. Rather, it sought to extend water resource availability to those previously disadvantaged. Third, this created a complex network of bureaucracies and systems of delivery that contribute to gross inefficiency and continuing inequality of access within the sector.

Fourth, at regional level there has been a long history of inter-state cooperation – against colonialism, against apartheid destabilisation, in support of regional development – especially following Zimbabwean independence in 1980. This legacy of cooperation forms a strong foundation for current efforts at achieving sustainable water resources management.

Fifth, national and regional efforts are supported practically by international donors, and theoretically by evolving approaches to water resources management in the global arena (SIDA, 1997; Conca and Wu, 2002; Giordana and Wolf, 2002).

Sixth, Mozambique’s current efforts at water reform take place within the very difficult context of nearly 40 years of anti-colonial and civil war.

Seventh, policy makers throughout the region recognise that water is a scarce resource whose per capita availability continues to decrease as economic activities and populations proliferate. Thus, through national reforms and regional institutional cooperation, SADC states are actively and jointly engaged in water resources management (Chenje and Johnson, 1996).

Nine factors may be identified as causing current and projected water insecurity/ies in the region (Government of Zimbabwe, 2000: 7-8):

- continuing inequities of use and access;
- too many actors/institutions and too little coordination;
- increasing competition for a scarce and finite resource;
- uneven water resources;
- declining quality of water resources;
- lack of state-generated finance to adequately run the sector;
- lack of a common policy/benchmark by which to judge actions in the sector;
- a narrow band of stakeholder involvement in the sector; and
- recurrent flood and drought on a large scale.

Two significant approaches to ensuring water security in the SADC region are institutional reform and augmented supply. While the former is new, the latter marks the continuation of past practice. In the context of water demand management (WDM), augmenting supply is argued to be a 'second best' approach. In a water scarce region, it is argued, states must learn to better manage the resources they have and to live within the means of natural availability (Goldblatt et al, 2000). However, all SADC states openly acknowledge the continuing value of supply-side water resources management. In terms of institutional reform, Dovers (2001: 215) has argued, in the Australian context, that 'institutions are both barriers to and opportunities for ecologically sustainable human development. Institutions can pervert or empower human potential'. What has been the impact of institutional reform in the general case of SADC and in the particular cases of Zimbabwe and Mozambique?

We now turn to the findings of our case studies. The first examines the new institutional frameworks being put in place in the name of 'water security'. The second examines the impact of augmenting supply to an urban area upon residents not only of the city but within the basin at large. The third looks at the role of water in urban household food security.

7 Case Study 1: Institutional Reform and Stakeholder Participation

As part of the national endeavour to ensure water security for all Zimbabweans (Government of Zimbabwe, 2000), comprehensive reforms are being undertaken in the water sector. As is only too well known, the impetus for such radical actions is usually a calamity. In Zimbabwe's case it was a series of severe droughts that devastated the country in the late-1980s and early-1990s. Given Mozambique's long history of war and human-made devastation, it was really only after the peace settlement and multi-party election of 1995 that similar reforms were undertaken.

Donor states, particularly the Scandinavians, are key players in the reform process – both in terms of monetary and technical support, and in terms of the philosophy underpinning current practice. Other donor states (e.g. USAID) and consortia (the EU) have brought their 'aid' into line with the Nordics; thus, current efforts are meant to be complementary. All focus on, among other things, regional integration through transboundary natural resources management, democratic institutional reform ('good governance'), more efficient states and more active markets (through a panoply of structural adjustment conditionalities). In terms of water 'security' this means commitments to water demand management (WDM), integrated water resources management (IWRM), integrated river basin management (IRBM), stakeholder involvement and resource management at the lowest appropriate level (through the creation of Catchment-based structures of authority), treating water as an economic good, and environmental protection.

In both Mozambique and Zimbabwe (indeed, throughout SADC), this has resulted in new water laws and the organisation of resource management on the basis of major river basins (of which there are 7 in Zimbabwe¹) or regions (in Mozambique

¹ These are the Gwayi, Sanyati, Manyame, Mazowe, Mzingwane, Runde and Save. Note the Runde/Save river basin was separated for administrative purposes. This seemed sensible given that the Runde joins the Save very near to the border with Mozambique.

corresponding to the ways in which the country is transected by major rivers (Limpopo, Nkomati, Save, Pungwe, Buzi, Zambezi). The stated goal is 'equity, efficiency, and sustainability' (Government of Zimbabwe, 2000). At the bilateral level, a Joint Water Commission Concerning Water Resources of Common Interest has recently been established between Mozambique and Zimbabwe.

All of these good ideas have been problematic in practice (Swatuk, 2002; Dube and Swatuk, 2002; Tapela, 2002). Four major problems will be highlighted here: entrenched interests; government motives; donor dependence; and current events.²

7.1 Entrenched Interests

A key mistake on the part of donors was to consider institutional reform as nothing more than a technical exercise. As Dovers points out, 'Institutions are defined more by the past than the present – they change slowly for the most part, and are more often suited to yesterday's understanding and imperatives rather than those of today, let alone those of tomorrow' (2001: 215). In Zimbabwe, the implementation of water reforms demonstrates a strong tendency toward top-down decision-making, and the dominance of the new institutions by those already empowered within society. Far from instituting resource management at the 'lowest appropriate authority', what we have seen so far is a determined scramble by various groups to retain extant power and hence secure their current positions in society. For example, the City of Mutare is a key stakeholder in the new water management but, having secured their supply via the Pungwe-Mutare pipeline project (a resource for which they pay the overarching water authority, ZINWA – the Zimbabwe National Water Authority – for raw water), they are unwilling to participate actively in Catchment and Sub-Catchment councils. 'We will participate when the need arises,' stated one city official (personal communication). At the same time, the Catchment Council itself quickly came to resemble a farming lobby – large-scale commercial, small-scale commercial, as well as smallholders – whose main 'management' task was attending to demands for more dams, weirs, canals and pipelines. In addition, a wide array of existing institutional authorities – District Councils, Provincial Governments, various government departments, to name but three – have yet to be integrated into the new management process. Indeed, these groups look warily upon the new water management structure, as it cuts across and impinges upon their jurisdictions.

7.2 Government Motives

Under Zimbabwe's new Water Act of 1998, all water belongs to the state which holds it in trust for the nation. What central government has done, in fact, is devolve *management* but retain ultimate authority. Far from being independent of central government, the new Catchment Councils act as revenue-collectors and police officers for central government. This very much resembles a patrimonial or feudal structure of authority – hardly conducive to sustainable, equitable and efficient management of a resource by its primary users, that is, those resident in the river basin.

² The detailed studies on institutional reform are available in Swatuk (2002), Dube and Swatuk (2002), Tapela (2002), and Manzungu (2003).

7.3 Donor Dependence

One of the recommendations to flow from a 1996 IUCN-ROSA³ organised conference on rehabilitation of the Save River was that activities undertaken should avoid over-reliance on donor expertise and/or capital assistance (Matiza, 1996). However, the over-reliance on donors has been a fundamental problem with the water reform process. From the first scoping exercise, to the pilot projects, to the extension of the process to the entire country, and on to Catchment Council operationalisation, donor capital has been key. This money was designed to last only as long as it took for the Catchment Councils to become 'self-financing'. This process was expected to take 18 months – an incredible time frame given the highly political nature of the entire process. Once the initial period passed and CCs were still in rudimentary form, donors decided to roll over the funds. However, given Zimbabwe's current problems with land reform, donors have frozen all funds, so subjecting developmental activities to political criteria. By mid-2002, the entire process ground to a halt. Since then, Government of Zimbabwe has established a River Basin Trust Fund through which resources are to be made available so that Councils may continue with the reform process. As of August 2003, however, this Trust was not operational.

7.4 Current Events

In Mozambique, the implementation process has been hindered by a different set of problems. Thirty years of war has resulted in an absence of capital, human resource capacity and functioning infrastructure. The process has been further complicated by a series of devastating floods (1998, 2000) that has left government with the onerous task of rehabilitating even the most basic infrastructure. Under current structural adjustment conditionalities, water supply and sanitation has been privatised throughout the country, with a Portuguese company (Aguas de Mocambique) responsible for delivery in Beira, the city at the mouth of the Pungwe River. These activities are being overseen by ARA Centro (Administracao Regional de Aguas do Centro), a regional body of the Water Affairs Department, DNA. ARA Centro was only established in 1998 and is currently becoming fully operational, but it will be many years before 'equity, efficiency and sustainability' will be realised.

In Zimbabwe, while government has indicated support for institutional reforms in the water sector as a budgetary line item, the entire process has been overtaken by land reform. Commercial farmers were more than willing to accommodate 'new occupants' as they were called. Granted, this cooperative attitude was borne of crisis; nonetheless, it was a positive development. However, political considerations led the Mugabe government to undermine any and all attempts at cooperation and conflict resolution outside of the channels established by ZANU-PF.⁴

The result, as is well known, is chaos. In the absence of comprehensive assistance from the government to 'new occupants' (e.g. farm loans; extension services), most land invaders have settled for small, subsistence-oriented cultivation near accessible water points, so achieving short term 'household' security at best. Yet, thousands of commercial farm labourers have been displaced by the land invasions. In the rural areas, personal security for the few has meant widespread insecurity for the many.

³ International Union for the Conservation of Nature – Regional Office for Southern Africa.

⁴ Based on personal observations. In particular, an Africa University-mediated, July 2001 meeting between land invaders, commercial and subsistence farmers designed to reach an amicable solution to struggles over water resources was aborted at the last minute by the Provincial Administrator.

The land ‘revolution’ also has wreaked havoc upon urban and peri-urban dwellers, as local and national economies have collapsed. All of this has been exacerbated by the aggressive response to the land crisis by Western governments. What do ‘river basin security’ or ‘sustainable water resources management’ mean in this context? At this point in time, they appear as little more than an intellectual conceit.

8 Case Study 2: Securing Urban Supply

As suggested above, user groups vary in need and capability. Responses to crisis, therefore, also vary. In response to the terrible droughts of the early 1990s, the City of Mutare cast around for ways to ensure its water supply. For various reasons, it settled on the inter-basin water transfer scheme highlighted briefly above (for details see Mukheli, Mosupye, and Swatuk, 2002; and Swatuk 2003a; also see Figure 1). There are several important points to be made about this project and its consequences.

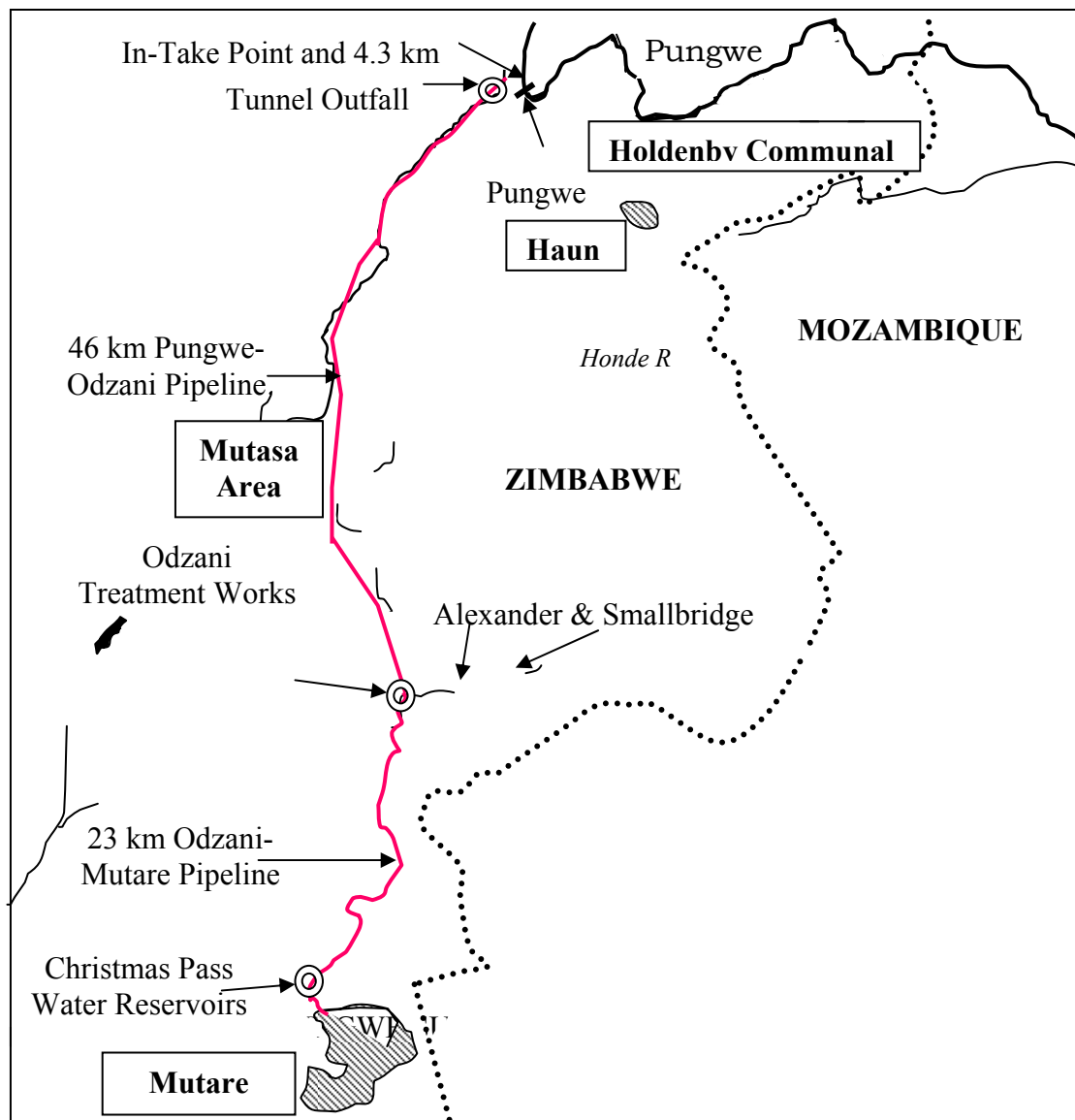


FIGURE 1: PUNGWE SUPPLY SCHEME ABOUT HERE

8.1 Coalition of Forces

First, the City of Mutare's decision to pursue augmented supply was supported by a coalition of forces that, in combination, made the Pungwe-Mutare water supply project the 'obvious' choice. These included the Government of Zimbabwe, various international financial institutions, the Swedish government, and Skanska, the engineering firm that won the contract and undertook the project. So, while a number of supply options were considered, the USD 100 million Pungwe River option held sway (for details, see Gumbo and Van der Zaag, 2002).

8.2 Growth Corridor

Second, in the post-1994 era, it was expected that Mutare City would become the dynamic centre of an economic growth corridor stretching from Harare to the Mozambican port of Beira. Mutare has long been a regional economic hub. It has large manufacturing and service sectors, and the city acts as a conduit for the timber and agricultural produce of the fertile Eastern Highlands. Mutare city planners believed quite correctly that its continued growth required a secure water supply. The city suffered terribly from the greatest drought in living memory. In 1992, Mutare ran out of water and businesses closed down. Water was severely rationed. As a result, the economy shrank significantly, and unemployment increased. The general mood in Mutare was, 'this must never ever happen again' (personal communication).

8.3 Regional Peacemaking

Third, the Pungwe-Mutare project was a clear cut case of regional peacemaking through water resources management. This stands in stark and welcome contrast to more controversial upstream activities like large dam construction, which historically have been undertaken unilaterally and to the detriment of those downstream. In September 1995, Zimbabwe's Minister of Lands and Water Resources, Kumbirai Kangai (also ruling party Chairman for Manicaland province where the project was to take place) and the Mozambican Minister of Public Works agreed that Mutare would be allowed to take a maximum of 0.7 m³/s, providing that it would always leave a flow of 0.5 m³/s in the river at the point of abstraction. The project got underway in December 1996 and was completed three years later.

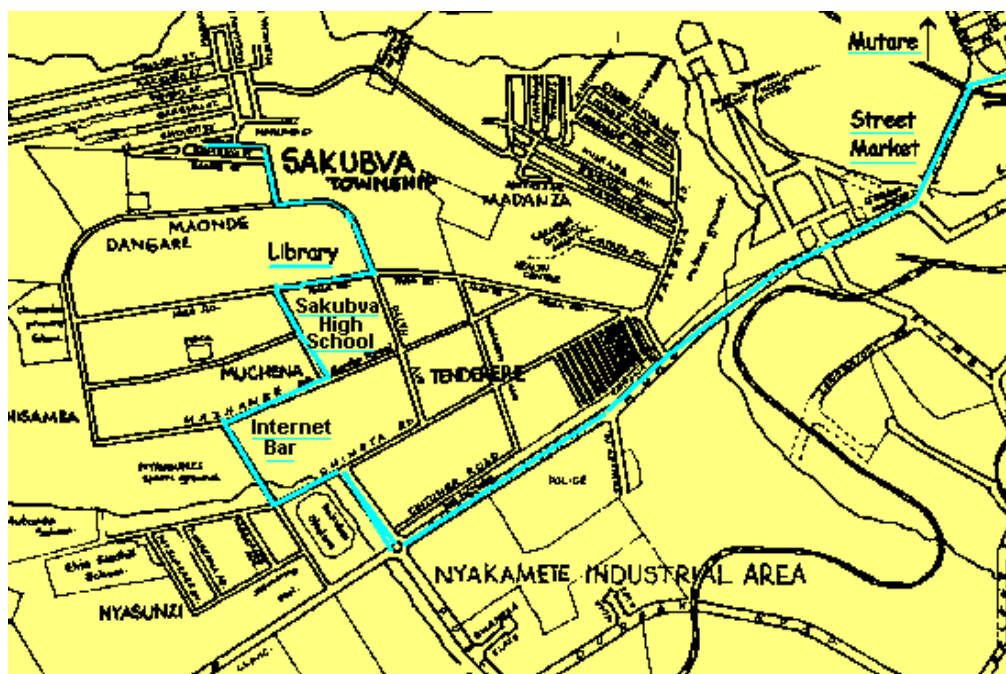
8.4 City Security/Basin Insecurity?

Fourth, and somewhat ironically, water 'security' for the City of Mutare has worked against the spirit of both IRBM and IWRM, hence against river basin security. As highlighted above, having secured its own water supply, the City is unwilling to participate meaningfully in the activities of the Catchment (Save) and Sub-Catchment (Odzi and Pungwe) councils of which it is a member. While arguing that the CCs and SCCs are concerned with farm issues, the ultimate goal of these institutions is to ensure the sustainability of supply. As a major polluter in the region, the City should feel obligated to begin considering ways to improve the quality of water discharged by its various factories. At the same time, the City remains unwilling to forego its extant rights to the waters impounded in the Alexander and Smallbridge dams, arguing that these are 'back-up' sources that must be secured for the long term. In consequence, these dams – which could assist in the livelihood and household security strategies of rural peoples – are presently little more than evaporation pans.

8.5 Urban Security/Peri-Urban Insecurity?

Fifth, the provision of adequate amounts of potable water for all of Mutare's citizens has unleashed a vigorous debate about the place of full cost recovery in urban water resources management. Given that a majority of Mutare's citizens are low-income occupants of nearby high density suburbs, this is an extremely contentious issue. It has also raised questions regarding other aspects of water demand management (WDM). In related research, it was revealed that unaccounted for water in the low-density portion of Mutare could be as high as 50% (Gumbo and Van der Zaag, 2002). In the high density suburbs (HDS) it is much worse. It is estimated that Mutare's HDS (Sakubva, Chikanga, Dangamvura) receive approximately 50% of all piped water. However, losses are estimated to be in the order of 90% (Gumbo and Van der Zaag, 2002). Constant flow has been re-introduced into systems whose infrastructure has long been in complete disarray. It is no exaggeration to say that the streets of Sakubva, the nearest HDS to Mutare, are awash with Pungwe River water (for details, see Mukheli, Mosupye and Swatuk, 2002; see Map 2).

Many people are asking why the Pungwe-Mutare project was operationalised prior to leak detection and system repair. After all, repairing 50% loss in effect doubles water supply. The answer is complex, involving a combination of actors, all of whom were interested in the political and economic 'lucre' to be had from construction of the pipeline. This highlights an on-going debate within the region regarding appropriate approaches to water security – while a great deal is being said about the need for WDM, the common approach, favoured by politicians and business persons alike, is augmentation of supply (Swatuk, 1996a and 1996b).



MAP 2: MAP OF SAKUBVA

In trying to deal with the problems of water supply and sanitation in Sakubva, the City Council has mooted a wide variety of WDM approaches, all of which are either

punitive in character (shutting off supplies, raising tariffs) or cost (water kiosks), so threatening the livelihoods of greater Mutare's most disadvantaged residents. Thus, 'security of supply' must be reinterpreted depending on which part of the city one is referring to. Ready access seems only to have complicated the lives of peri-urban dwellers, and exacerbated the problematic relations between City Council and HDS.

8.6 Waste not, want not

Lastly, the image of all this wasted water flowing through the pipes and streets of Mutare cannot sit well for long with other user groups: in particular, rafting operations whose business season has been shortened by two months due to lower flow regimes south of Pungwe Falls; rural dwellers north of the off-take in Nyanga communal area who suffer surface water deficit; Mutasa communal area dwellers who see the pipeline pass right through their territory and dream of water for irrigation; and those at Hauna growth point and the communal dwellers in the Honde Valley who also have visions of secure water supply and increased crop yields. At basin level, while the 0.7 m³/s off-take agreed to by the government of Mozambique – well-used or not – has no meaningful impact on the Pungwe's flow in that country (Magara and Tapfuma, 2000), the fact of such abject waste will no doubt raise questions in the minds of Mozambican water planners as they sit down to consider further off-takes from the Zambezi, Limpopo or Save.

9 Case Study 3: Water for Food Security

Our final case study focused on urban agriculture as a means for ensuring food security for peri-urban households. Often times the argument is made that water resources management cannot be successful if considerations are not given to how land is managed – hence the concept Integrated River Basin (as opposed to Water Resources) Management. While it is clear from the study of institutional change above that problems on the land can create insurmountable problems for the successful management of water resources in rural areas, there is relatively less said about the role of urban land in water resources management issues. Thus, this case study looked very closely at the interrelationship between land and water through the very appropriate lens of strategies for food security in peri-urban areas.

A strong emphasis was placed on the role of women in urban agriculture as it became clear very quickly that, like water resources management in general, urban agriculture is the women's domain (Makwanise, 2002). However, this situation is complicated by the fact that women have no security of tenure in Zimbabwe, and in general are engaged in off-plot cultivation on land owned by City Council and slated for non- or different-use.

The case study demonstrates how central urban agriculture has become to the household survival and food security strategies of poor people in Zimbabwe. Indeed, some people are making quite a good deal of money from these activities, so contributing to the improvement of living standards. It also illustrates the wide variety of ways in which water in the peri-urban setting contribute to household security: from illegal connections to deliberately vandalised off-plot sources, from grey water use to streambank cultivation (these are detailed in Makwanise, 2002 and Gogwana, 2002).

City Councils are loathe to allow off-plot cultivation for a variety of reasons: streambank cultivation is environmentally damaging; and roadside and open area cultivation contravenes the law so calling into question the legitimacy of the City Council's right to rule. At the same time, the current political and economic instabilities being experienced by all Zimbabweans are leading City Council toward more proactive strategies for sustainable urban agriculture. For example, Mutare City Council has gazetted peri-urban land specifically for off-plot urban agriculture. Access to this land requires a registration fee for which, somewhat ironically, local people are not willing to pay. Urban agriculture is a fact of life and Zimbabwean politicians are moving toward accommodation and away from confrontation at national and local levels.

10 Recommendations

Numerous conclusions, observations and recommendations emerge out of the case studies. We articulate these below.

With regard to institutional reform:

1. Catchment councils remain a good idea and should not be discarded because of early setbacks.
2. Participation on these councils, however, overwhelmingly reflects the dominant interests and ways of thinking in society. They should, like any other institution, be regarded not as a panacea but as a possible improvement on past practice. Checks and balances should be put in place to ensure the broadest base of stakeholder participation.
3. Governments, in the context of debt and political instability remain very unwilling to devolve real power to these new institutions. Those interested in seeing IWRM really work, must acknowledge the presence of this difficult fact.
4. Donors have their own visions of these institutions and too often impose their ideas/ideals upon 'recipients'. Space must be made for these river basin organizations to develop organically. Templates should be resisted at all costs, no matter how attractive they appear to be or cost effective they are.
5. Perhaps the most important activity that must continue is research – both the collection of hard data regarding the natural resources base, and social scientific investigation into a wide variety of areas: e.g. stakeholder use patterns; consumer willingness to pay for resource developments; the dynamics of intra- and inter-institutional decision-making; the ways in which specific resource 'sectors' are integrated into and affected by wider social, economic and political factors, forces and actors. The list is virtually endless.

With regard to water and sanitation in urban/peri-urban areas:

1. While it is a good thing that the World Summit on Sustainable Development chose to focus on water supply and sanitation issues, the predilection for full cost-recovery mechanisms in poor places will no doubt fail.
2. Assured access to potable water does not equal 'human security'. Poverty, food insecurity, health risks, among other things may undermine the best efforts to provide equity, sustainability and efficiency in water supply.

3. Blend prices and state cross-subsidies, therefore, must continue if poor people are to have access to water resources and sanitation.
4. In situations where there are vast disparities in wealth in a shared urban space, as is the case with Mutare/Sakubva, and where a tradition of militancy has been developed by people in the high density suburbs, it will take great creative energy to find the proper forum and language through which to solve what are virtually intractable problems.
5. Community participation of resource management at all levels of decision making (including involving local people on the City Council) is essential.
6. Training programmes (e.g. for self-employment programmes like pipe repair), too, are essential if local people are to be made partners in the management of their own resource base.
7. The active involvement of youth, women and (I)NGOs in the management of the community, particularly in the common block areas where resource use most closely resembles open access, is also a viable policy option.

With regard to urban agriculture:

1. Rapid urbanization is unavoidable, as current trends throughout the developing world show no signs of abatement. In a context of a down-sizing state, it is unreasonable to think that people will adhere to what are largely Western/Northern models of urban planning.
2. As a result, creative ways and means must be sought to make the best of the reality of urban agriculture: it is a realistic, viable and sustainable means for household security and should be embraced.
3. Zimbabwe's current turn toward recognition and legalization of urban agriculture is an important starting point.
4. Guidelines should be developed regarding how and where urban agriculture is to be facilitated. A great deal of work in this area has been conducted in the Asian world and a variety of state and non-state actors could be approached for advice and assistance.
5. Land should be regazetted to maximize off-plot cultivation
6. Water points for off-plot cultivation should be developed, otherwise illegal connections and vandalized water points will proliferate
7. Wastewater and organic waste use should be promoted
8. Agricultural extension services and other inputs traditionally reserved for the rural areas should be made available to urban farmers
9. Access to credit and finance should also be made available
10. Given the central role played by women in water resources management and urban agriculture, policy must put gender issues front and center if it is to be sustainable.

In general:

1. How conflicts manifest and are resolved differ across political cultures. African traditions of consensual and patrimonial political practice help facilitate collective decision making at elite level but create particular barriers to participation – beyond simple acquiescence – below that level.
2. History forms an important back drop. Not only the history of state-making and maintaining, but a variety of other narratives and foci as well: liberation struggles; sub-national struggles for land rights; migration; wealth-creation.

All of these help frame the context of and possibilities for sustainable water 'sector' management.

3. It is a mistake to consider national, sub-national, intra-basin but international case studies outside of broader regional and global contexts. Regional protocols, institutional forms, policy frameworks, global trends, IGO and NGO activities, donor state policy frameworks all have a meaningful impact on 'local' issues.
4. Aggregate data can be misleading. Population dynamics, 'water stress' measures and human development index indicators are all subjective representations of select 'facts'. As such, they can be manipulated to tell a wide variety of sometimes contradictory stories.
5. Different analytical frameworks yield new insights. Shifting the focus from states to ecosystems or river basins, or from state-security to human-security and/or gender inequality, shifts our understanding of the place of water in social and biological systems. It is therefore important to revisit our analytical frameworks/theories and interrogate underlying assumptions.
6. A variety of social forms and institutions are necessary for the successful management of water resources. Communities, international (non)governmental organisations, urban/rural organisations, states and (international) laws, to name several, all must be made partners in a clearly articulated project.
7. Outcomes are not necessarily what they seem. Too often, donor projects pre-explain 'failure' via, for example, 'limited human resource capacity'. Yet, 'failure' at donor level may in fact equal 'success' for powerful local social forces intent on maintaining the status quo.
8. Given that there are likely to be numerous unintended consequences of policy and project implementation, projects must be flexible. What must remain inflexible, however, is the answer to the question: Who is the intended beneficiary of this project?

11 Concluding Remarks

This project has focused on the place of water in the theory and practice of 'security'. It has argued strongly for new approaches to thinking about water resources management in the Southern African region. Specifically, it has argued that locating thinking and future planning about water resources within the ambit of the self-regarding state is deeply problematic, particularly when the dominant framework used is 'national security' (Swatuk and Vale, 2001). In a region with an abundance of shared water resources, this is a recipe for trouble.

At the same time, we recognize that states are the dominant social forms in the region and the only likely locus in the short term for globally recognized laws and other enforcement mechanisms. We therefore must work with states, not against them (Swatuk, 2003c).

To this end, this project has presented a number of novel ways of thinking about water resources management – what we would like to think of as constructive interventions that help move the regional dialogue away from its abiding fascination with 'water wars'. We have highlighted the importance of language in the framing of issues and challenges: in this project we have taken a deliberately optimistic stance on

possibilities for sustainable water resources management – a position we think is supported by the evidence put forward in the case studies.

In terms of technique and method, we have argued strongly for a constructivist approach that employs critique and reflexivity. In practice this means rereading history, unpacking accepted ‘wisdoms’, questioning dominant episte-methodologies and ontologies, asking difficult questions, and approaching ‘old’ issues in highly unconventional ways.⁵ It also means recognizing that we, as ‘experts’, do not have a monopoly on knowledge. We should approach our topics humbly and be willing to accept the uncomfortable truth that we may in fact be wrong. Indeed, even the most cursory survey of global thinking about water resources allocation and management over the last ten years reveals almost constant revision. We must, as we have said above, acknowledge that knowledge is power, and that as such water resources allocation and management is much more than simply getting the institutions or the science ‘right’.

At the same time, we also feel that a critical social science method complements the hard sciences traditionally associated with water resources management. We believe that the results evident in the large number of published scientific papers emerging from this project offer testimony in this regard.

11.1 Water Wars?

In this project we have identified a wide variety of uses of and inequalities of access to the natural resources of the Southern African region, the Zimbabwe and Mozambican states, and the Pungwe and Save River basins. We have also highlighted various conflicts (intra-urban, intra- and inter-sector) but also a good number of cooperative activities. We have argued that the region demonstrates a historical pattern of inter-state cooperation, and that many international actors contribute to this climate of cooperation (but also contribute toward conflict as well). Even in the case of a land revolution in Zimbabwe, this process has been remarkably peaceful especially when placed in global historical context. While there is great wealth in the region, the vast majority of the people resident there are poor.

As Bernard Brodie observed, in the modern era ‘the predisposing factors to military aggression are full bellies, not empty ones’. The poor and wretched of the earth may be able to deny an outside aggressor an easy conquest, but they are themselves a minimal threat to outside states. (Deudney in Conca and Dabelko, 1998: 312)

Try as they might, those who are convinced of the ‘water wars’ hypothesis are hard-pressed to find evidence that would support such thinking. This fact has, in our estimation, led many of the early doomsayers away from retrogressive geopolitical frameworks toward more progressive forms of analysis (see, for example, Solomon and Turton, 2000). ‘Water’ is increasingly located where, in our estimation, it belongs: in discourses of human security, ecosystem sustainability, health and

⁵ J.A. Allan’s concept of ‘virtual water’ and J. Rockstrom’s discussion of the role of ‘green water’ in food production are two particularly useful new ways of looking at an old problem: water for food. See Allan (2003a) and Rockstrom (2001) for details. Compare the rather conventional approach presented in Gleick, 2000.

development. Clearly, the arguments will continue but they will be set within more supportive frameworks and constructive languages. In the Southern African context, for example, the annual meeting of Warfsa/WATERNET, now into its fourth year, is testimony in this regard.

11.2 Security?

In terms of security, it is clear that some have it and some do not. While this project has been centrally concerned with enhancing human security, including equitable access to water resources, it reveals the many contradictions embedded in the term 'security'. For example, a 'secure' water supply for the City of Mutare creates special insecurities for the poorer residents there. It may also lead to the build up of animosity between the City and other user groups within the river basin. Institutions designed to enhance national water security lead, instead, to a deepening of extant unequal social relations. In the context of wider societal insecurity – as exists in both Zimbabwe and Mozambique – it is perhaps understandable how reforms result in resource capture by those already empowered and further economic marginalisation of the poor. No amount of free fresh water will lessen the inequalities between those in the state house and those in Sakubva. To be sure, access to copious amounts of freshwater in the HDS around Mutare does assist in household security, particularly in the increasingly common practices of urban agriculture and water-dependent informal sector manufacture (of, for example, tombstones, cinder blocks, bricks). But these activities themselves are testimony to the heightened levels of insecurity felt by the poor in Zimbabwe (see Gogwana, 2002; Makwanise, 2002).

11.3 Water Resources Management as Symptom

This leads us to our last point. In terms of analytical and/or theoretical frameworks, river basin security – which lies quite comfortably with both IWRM and IRBM – is compelling. It encourages us to consider using resources within their natural system, an idea that stretches back to Aldo Leopold's notion of a biotic community. It also counsels subsidiarity: that those closest to the resource will take decisions regarding its use, so implying a wide variety of social goods: sustainability, equity, efficiency, good governance and the like. These are very seductive assumptions. But we would do well to listen to Newson (2000: 211):

The 'river basin ideal' spans many centuries, from the pre-historic civilizations of, e.g., the Nile, the Indus and the Tigris/Euphrates. It is tempting to idealize the coordination and sustainability of resource use inherent in these units... In the modern world, notably in the twentieth-century, basin-scale river management (and land development) through river basin institutions has become popular beyond its proven record of success... [I]t must be admitted that the model has faced arduous circumstances with its unmodified application to drylands (the focus of the current 'water crisis') and to the many basins shared by more than one nation state.

As we have seen above, the attempt to operationalise river basin management through Catchment Councils has faced many socio-political obstacles. Nevertheless, in our estimation, river basin analysis adds sophistication to our thinking about the ways in which society, economy, polity and ecosystems interact within a specific geographical setting. In something of a paradox, however, this attempt at analytical integration

within a delimited geographical space masks the fact that water, natural resources, and the basin itself are fragmented elements within greater regional and global circuits of power. Water resource use is a manifestation of and is embedded within a complex series of sub-national, national, regional and global power relations. These relations interact in various ways with only one of many results being *inequity*, *inefficiency*, and *unsustainability* of water resources management. It is therefore no accident that the anti-globalisation campaign has latched onto water resources management as a flagship issue, for inequalities of access are symptoms of both local and global causes (Bond, 2002).

Security and insecurity are manifest at different levels in different ways. Thus, while a necessary component of river basin security involves working toward an understanding of how resources are used, and how different systems overlap and interact, this can only be a partial solution. The basin itself must be located within a wider theoretical framework – one that critically interrogates the political economy of development and underdevelopment in a simultaneously globalising and fragmenting world (Mittelman, 1997; Hettne, 1995). A critical perspective grounded in social theory may not immediately lead us to clear policy options. It does, however, help us toward, for example, a better understanding of the relations between water resources management, the land crisis in Zimbabwe, and regional and international responses. In other words, it helps reveal the social relations of power – a difficult but unavoidable step if we are seriously concerned with improving human security (Vale, 2003).

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CHAPTER 2:

RATIONALE

2.1 Introduction: Water Wars

Ten years ago Ismael Serageldin of the World Bank stated ‘the wars of the next century will be over water’ (quoted in African Development Bank, 1994: 39). About the same time, Yeld (1993: 33) speculated that South Africa ‘will experience the equivalent of permanent drought somewhere between 2002 and 2040. Water rationing is likely to become a fact of life.’ A few years later, Conley (1996: 19) stated, ‘South Africa at present represents an example of a country which has reached a stage in its development where its scarce water resources will have to be allocated increasingly to the most worthwhile purposes only. It has become necessary for each water use to warrant the cost of providing the water.’ In 1997, Pallett and others, using a simple formula devised by Falkenmark (1986), presented a graph illustrating ‘water stress’ in the SADC region.

Policymakers in the region, taking their cues from international scholarship (Homer-Dixon, 1991, 1994) and popular opinion (Kaplan, 1994), framed water resources management within a discourse of state security and inter-state vulnerability. Hence, sovereign states acting independently to secure water supplies presented the possibility for increased conflict over water resources in the future (Ohlsson, 1995). Moreover, it was hypothesised that global climate change, population increase, and limited renewable and non-renewable resources, constituted a volatile brew where inter- and intra-state conflict – i.e. ‘water wars’ – could become manifest in the near future (Turton and Warner, 2001).

2.2 Water as a Developmental Issue

This project was conceived as a direct intellectual challenge to the water wars hypothesis. The rationale for the project derived from the cognitive dissonance shared by the research team between the near global claims over ‘water wars’ and environmentally-induced ‘coming anarchies’ and the evidence on the ground – the ground, in our case, being Southern Africa.¹

Clearly, environmental problems in Southern Africa are legion, as are problems with water resources management. Most of these, however, are the result of a global history of development and underdevelopment – a global history of which, in a variety of ways, Southern Africa has been an integral part for many centuries. The consequences of this

¹ The research team consisted of: Dr. Larry A. Swatuk, University of Botswana, Dr. Pieter van der Zaag, University of Zimbabwe, Prof. Lisa Thompson, Centre for Southern African Studies, University of the Western Cape; Dr. Mafaniso Hara, Programme for Land and Agrarian Studies, University of the Western Cape; and six M.Phil. students whose contributions to this project constituted their Master’s theses: Dumisani Dube, Azwidowi Mukheli, Gilbert Mospuye, Barbara N. Tapela, Moses Makwanise, Makosi Gogwana. The project was made possible by generous grants from the Water Research Commission of South Africa and the Ford Foundation. The project also owes its inspiration to Prof. Peter Vale, Nelson Mandela Chair of Politics and International Relations, Rhodes University, South Africa.

history in the region are poverty and marginalisation for the many, wealth and power for the few (SADC, 2000). Surely, then, environmental problems – including water resources management – form part of a long-term developmental agenda. To quote from a SADC report prepared for Rio Plus 5 meeting held in Kyoto (1996: vii):

We must never forget the majority of people and countries in the SADCC region and the world are poor. If the poor sometimes behave in a way that degrades the environment it is not because they choose to do so. They only do so when they have no other choices. The Earth Summit and Agenda 21 must expand the development choices and opportunities for the majority of poor people, communities and countries. The Earth Charter and Agenda 21 must provide a new basis for a new deal for the majority of poor people and countries in order to secure and sustain our common future.

2.3 Environmental Security

Somewhere in the 1980s, however, ‘the environment’, and later, in the early-1990s, ‘water’ became high politics, quickly finding their respective ways into various discourses of ‘security’, in particular traditional conceptions based on inter-state rivalry and the never-ending quest for sovereignty and autonomy. How the environment became captive to this discourse is nicely encapsulated in the collection *Green Planet Blues* (Conca and Dabelko, 1998: 279-316) and need not be reiterated here.

As with the environment, so with water. For some, worries over ‘water wars’ were a way to galvanise support. To quote Deudney: ‘the aim of these new links is not primarily descriptive, but polemical. It is not a claim about fact, but a rhetorical device designed to stimulate action’ (in Conca and Dabelko, 1998: 308). But for others, worries over water were real (Klare, 2001).

Without doubt it was flattering for water engineers, city planners and irrigation experts to find the world of statesmen knocking on their office doors, if not following them into the bush or the pit latrine. In the Southern African context, a number of papers were written by or at the behest of donors regarding ‘environmental security’ (SIDA, 1997) and ‘water and security’ (Ohlsson, 1995). Most built on the work of Homer-Dixon (1991; 1994) and/or Falkenmark (1986; 1989) whose ‘science’ was exploratory at best. Many in the region were immediately taken by the idea (Swatuk, 1997; Solomon, 1996; Green Cross International, 2000), many still are, but most have undertaken to reconsider earlier positions and frameworks in the light of new research findings (Nakayama, 2003; Turton and Henwood, 2002; Turton and Warner, 2001). As political scientists in the region argued over appropriate theoretical frameworks (Swatuk and Vale, 2000; Thompson and Swatuk, 2000; Thompson, 2002; Turton, 2000; Solomon and Turton, 2000), a variety of city planners and water engineers were brought in to speculate on ‘water wars’. The results were, as one might expect, embarrassing, with engineers trying to write about leaky pipes and national security and political scientists trying to write about the political economy of artesian springs.

With time one can detect a welcome, if slight, shift in the discourse away from ‘water wars’ and acute conflict probability toward ‘water for peace’ and cooperative peacemaking potential (Swatuk, 2002; Turton, Ashton and Cloete, 2003). Indeed, this was a major goal of the theoretical component of our project – to try and change the language being used to talk about water resources management. These gains appear to have been made also at global level (Conca and Dabelko, 2002; Asmal, 2001; SIWI, 2003; Allan, 2003a and 2003b).

While progress has been made in moving the discourse away from what Dabelko and Van DeVeer (1999) call ‘securitising the environment’, losses have been suffered through what might be called the ‘privatisation of water security’. That is to say, water reform processes throughout the region have come under increasing pressure to treat the resource as an economic good, and to gear water resource developments and improvements toward full cost recovery, user pay fees and the like (Swatuk, 2002; 2003a). This is leading toward what Bond (2002) accurately calls ‘flood for the few and drought for the many’ – in other words, a new ‘water apartheid’. Thus, it seems we are back to questions of ‘security’: but what kind and for whom?

2.4 New Thinking/New Framings

Ultimately, what we argue for are new ways of thinking about water resources. This requires first and foremost a rereading of history. Put more bluntly, it requires the telling of a more honest and critical regional history. It requires a rearticulation of security – away from state security and military power toward human security and the empowerment of individuals and communities (Vale, 2003). It requires a relocation of ‘water’ – from states to ecosystems or communities or river basins (Swatuk, 2003c; Swatuk and Van der Zaag, 2003); from ‘expert’ men in urban settings to rural women and traditional knowledge; from the realm of foreign policy toward progressive development discourses; from water as an economic good to water as a common property resource. Without doubt, the theoretical framework and the language used to articulate it matter a great deal (Allan, 2003b).

There are presently two dominant trends in thinking about the future of Southern Africa: one pessimistic and Realist; one optimistic and neo-Institutionalist. Somewhere in between lie more critical discourses (Bond, 2002). Taking a position is not simply a matter of objectivity; it is a political act. In our project we deliberately chose the critical path while leaning toward the optimistic side – in other words, toward peace, cooperation and river basin communities and away from war, conflict and the hyper-masculine state (Pettman, 1996; Peterson, 1992). This perspective, born of reflection and critique, is imbued in our empirical case studies.

2.5 Key Points

Several key points emerge from this short discussion.

- Exploitable water resources in Southern Africa are finite

- The region is characterised by relative water abundance but structural/socially-constructed scarcities
- Conflicts over water resource allocation and usage are likely in future
- It is unlikely that these conflicts will lead to 'war' but will continue to result in subnational and/or transnational localized conflicts
- It is necessary to determine appropriate mechanisms for sharing the region's water resources
- The 'water wars' discourse may impair creative thinking regarding ways of sustainably managing the region's water resources
- It is therefore necessary to explore other ways of thinking about the causes and consequences of past, present and future natural resources use, particularly water
- These alternative ways of thinking should be grounded both theoretically and empirically

Taken together, these seven points may be considered the rationale for this project.

CHAPTER 3:

AIMS AND OBJECTIVES

3.1 General Aims

There were two general aims of this project, one intellectual, the other practical. In terms of the overall intellectual aim, the project sought to theoretically and empirically challenge the ‘water wars hypothesis’. Practically, the project sought to build local capacity by involving students who would earn M.Phil. degrees in the process.

3.2 Specific Objectives

A number of specific objectives follow from these aims.

- To constructively engage wider regional and global policy and academic communities in debate regarding the appropriate theoretical lenses through which to view water resources use issues. This objective would be met through workshops, public seminars and a variety of popular and academic publications.
- To develop a series of empirical studies that would add to the existing body of knowledge in the region about various aspects of water resources use and management
- To deepen theoretical approaches to and thinking about water resources management in the region.
- To link theoretical approaches to water resources management to a series of empirically grounded case studies.

3.3 Working Hypotheses

The project was informed by three working hypotheses:

- Resource scarcity is, in the first instance, more likely to lead to cooperation before it will lead to conflict.
- Changes in information and the way that information is framed can change the strategic climate for decision-making; so, framing issues in terms of securing, say, ‘South Africa’s water’ encourages exclusion and privileges confrontation, whereas securing ‘regional water supplies through integrated water resources management’ encourages inclusion and privileges cooperation.
- Post-Westphalian forms of governance that emerge around specific issues can be institutionalised and lead toward broader forms of cooperation at sub-, inter-, and trans-national levels.

CHAPTER 4:

METHODOLOGIES

4.1 Inter-disciplinarity

This project was self-consciously **inter-disciplinary** in nature. It brought together an engineer, a biologist, and two political scientists in the hope that a shared vision could fashion a shared research project. It was also **inter-institutional**, bringing together the Centre for Southern African Studies in the School of Government at the University of the Western Cape, the Programme for Land and Agrarian Studies also at UWC, the Department of Politics at the University of Botswana, and the Faculty of Engineering at the University of Zimbabwe. Further links were created with Africa University in Mutare, Universidade Catolica de Beira in Mozambique, and the Peer Educators Programme of the Department of Health, City of Mutare. As it progressed, the project also led to a wide variety of other linkages to similar projects on-going in the region: the Municipal Services Project, co-ordinated by Queen's University in Canada and Wits University in South Africa; IWRM processes co-ordinated by the Overseas Development Institute in the UK; Water for Peace activities co-ordinated by Green Cross International and its local partner, the Pretoria-based African Water Issues Research Unit, to name several. These are positive developments that will no doubt lead to future co-ordinated research projects.

The project also benefited from multiple sources of funding, most importantly the Water Research Commission of South Africa. It also could not have happened without the support of the Ford Foundation, or the in-kind contributions of IHE-Delft. It was also greatly dependent on the in-kind contributions – e.g. salaries for project principals, support staff – from UZ, UWC and the University of Botswana.

The project mixed **quantitative** with **qualitative** methods. It depended, for example, on the data gathered by Van der Zaag's students at the Faculty of Engineering, University of Zimbabwe. It also depended on the data generated by a number of consultancies examining the water resource base in the Pungwe/Save River Basins, including the City of Mutare. It also made use of the quantitative data in a number of other studies conducted as part of the Local Agenda 21 programme at Africa University. Primarily, however, the project utilised qualitative methods to gain an understanding of resource access and usage in the project area. Some of these methods are outlined below.

The project used a mix of methodological approaches, which may be distilled to desk studies and case studies.

4.2 Desk Studies

These studies were conducted at various points throughout the life of the project and are described below.

4.3 Literature Reviews

Studies were conducted of several separate but sometimes related literatures: on the political economy of regional security; on water resources management; on environment and security; on gender and development; on urban agriculture; on security broadly defined; and on environmental security in Southern Africa. These literature reviews were conducted for two reasons. First, to familiarise ourselves with the subjects at hand, all relevant issues in the Southern African region in general and in the project area in particular. Second, so that subsequent field work could be more focussed and new information quickly assimilated in context.

4.4 Theoretical papers

Given the central role theory played in this project, a number of desk studies were conducted on various aspects of environmental security and natural resources management. These studies were conducted throughout the project period and informed and were in turn informed by the empirical studies (Swatuk and Vale, 2000; Swatuk and van der Zaag, 2003; Swatuk, 2001; Thompson, 2002; Thompson and Swatuk, 2000).

4.5 State of the Resource review

A desk study examining the ways in which water resources are presently being managed in the SADC region was conducted so that the case studies could be linked to general developments in the region (Swatuk, 2002).

4.6 Workshops

Several workshops were held and/or attended where the desk studies were subjected to peer review.

4.7 Case Studies

4.7.1 Study Area

The project chose the River Basin as its basic unit of analysis in line with emerging international and regional considerations of Integrated Water Resources Management (IWRM) (Newson, 2000; Goldblatt *et al*, 2000). The Pungwe and Save River Basins, shared by Zimbabwe and Mozambique, served as the case study area. The two river basins are adjacent to but distinct from each other; they are, however, conjoined through the Pungwe-Mutare pipeline project, which brings a fixed amount of water (700 litres/second, or 0.7 m³/second, equal to 22 million m³/year) from the headwaters of the Pungwe River via a 79 km gravity-based network of tunnel, pipe and canalworks to the City of Mutare. The Pungwe River, initially considered part of the Mazowe River

catchment area (which drains northward into the Zambezi River), was designated part of the Save River Catchment Council for administrative purposes. However, it neither naturally drains northward into the Zambezi nor southward into the Save.

These basins were chosen for a variety of reasons:

- All dominant forms of water resources use are present (large urban, peri-urban, mining, large and small agriculture, national parks, tourism)
- An operational inter-basin water transfer scheme is in place in the upper reaches of the Pungwe River catchment (the Pungwe Water Supply Project). This project diverts 0.7 m³/s from the Pungwe River to the City of Mutare which lies in the Save River catchment area
- A variety of real and potential resource use conflicts are present (between, for example, upstream and downstream users, rural and urban, intra-urban, intra-rural, commercial and smallholder agriculture)
- A variety of new attempts at peacefully managing the resource, including a new Water Act (1998) and new institutional forms (Catchment Councils) were also present
- Water resource availability was highly varied throughout the two Basins, subject to both geography and a climate characteristic of wet/dry cycles and recurrent drought and flood

4.7.2 Scoping Exercises

The project principals – Swatuk, Thompson, Van der Zaag – undertook two separate scoping exercises in July 2000 and September-October 2000. This was followed by the substantive field work portion of the project in June-July 2001 (Hara, Van der Zaag, Swatuk).

The initial scoping exercise was carried out over the Zimbabwe/upstream portion of the Pungwe River, including the areas surrounding the off-take pipeline, and the City of Mutare including its high density suburb of Sakubva. This scoping exercise helped project principals gain perspective on the kinds of water-resource related issues that were important to this part of the Basin. Site visits were also conducted to the Pungwe Water Scheme off-take point and to the Rhodes-Nyanga National Park which lies in the upper-catchment of the Pungwe River.

The second scoping exercise was undertaken along the middle and lower catchment of the Pungwe River. As part of this scoping exercise, the project principals (Van der Zaag, Thompson, Swatuk) visited various sites, people and organisations in Beira. In the main, it was our intention to (i) get a feeling for the kinds of issues and concerns revolving around water scarcity, plenty, and provision particularly in Beira but also among all stakeholders in the Pungwe River Basin (e.g. large and small scale agriculture, industry, national parks) and (ii) to identify partner institutions or individuals with whom we might work in future.

Following each exercise, the project principals held formal meetings in Harare to discuss ways forward. Attending these meetings were Tabeth Matiza, GWP, and Jennifer Katerere, an environmental lawyer, both of whom we hoped, at that stage, to involve in the project – Matiza to focus on environmental health and Katerere to focus on international law and river basins. However, due to a variety of constraints, these individuals were not directly involved in the project, though they were consulted informally from time to time.

4.7.3 Key Informant and Stakeholder Interviews

During the scoping exercises and extensive field work period, primary data was collected via informal and semi-structured interviews with key informants and stakeholders in the case study areas. Researchers were equipped with a checklist of topics for all interviews reminding us of all relevant issues. Key informants included staff in various departments and line ministries, personnel working on projects and NGOs in the region, some committee members, local leaders, and ordinary people. All interviewees were allowed to answer questions and explain various activities, issues, etcetera, without use of leading questions or the giving of opinions by researchers.

A SWOT analysis (Strengths, Weaknesses, Opportunities, Threats) of these interviews was undertaken identifying problems, successes, advantages, disadvantages and lessons learnt across the specific case study areas (e.g. urban agriculture; water supply and sanitation; institutional restructuring).

4.7.3.1 Limitations of Interview Data

This data should be considered as qualitative, indicative and/or preliminary, not definitive.

4.7.4 Hydrological Data

A variety of sources provided raw hydrological data for the project: e.g. Inter-Consult study of ***Pungwe River Hydrology Impacts of Water Transfer***; the GAMZ project's ***Preliminary Results from the HBV Hydrological Modelling in the Upper Pungwe River***; the Government of Mozambique's and the Companhia de Aguas da Beira's study of ***Salt Intrusion in the Pungwe Estuary***; the IUCN's ***Save Catchment Rehabilitation*** project; and various raw and processed data collected by Van der Zaag's engineering students working on water losses in Mutare city (e.g. Gumbo and Van der Zaag, 2002).

4.7.4.1 Limitations of Raw Scientific Data

This data should be considered as incomplete and partial and therefore indicative, not definitive.

4.8 General Methodology Followed by Students

As students were undertaking primarily qualitative analyses, they were encouraged to use a triangulation strategy in conducting their research (Denzin 1970,1978). Triangulation refers to the combination of multiple methods of observation, which direct a researcher to utilize several different tools in the observational process. The rationale for this is that no method alone can adequately treat all problems of discovery and testing. Since each method has restrictions, by combining several methods in the same study, the restrictions of one tool are often the strengths of another. The greater the triangulation in a research design, the greater the confidence a researcher may have in his/her findings. According to Denzin in Mouton and Marais (1994:206), a triangulation strategy should embrace the following:

- Multiple data sources, whereby the researcher goes to as many concrete situations in a setting as possible to form an observational base;
- Multiple methods, whereby any and all techniques that can better unravel the processes under study are used; and
- Multiple perspectives, where participants' accounts of their behaviour are compared with alternative theoretical schemes.

To achieve the objectives of their studies, students used various participatory methodologies and tools:

- **Direct observation:** By living in their research area, the students in Sakubva and Dangamvura directly observed and participated in the daily practice of water use and management there
- **Questionnaire:** The researchers in Sakubva designed and administered a questionnaire to their peer educators group.
- **Formal and informal interviews:** All students conducted both types of interviews. Each student developed an interview protocol consisting of a brief introduction and a list of ten open-ended questions. Formal interviews were held with, *inter alia*, Mutare City Council officials, government officials, the executive member of the Mutare Residents' and Ratepayers' Association, and select residents determined by the transect walks. Informal interviews were conducted on an ad hoc basis, often in informal settings, that is, wherever the researchers felt they might acquire useful information. Those working on institutional reforms conducted formal interviews with, among others, the Save River Catchment Manager, the Training Officer, and elected members of the Save Catchment Council and Odzi and Pungwe Sub-Catchment Councils. Informal interviews were conducted with residents of rural areas in the Pungwe and Odzi sub-catchment areas, as well as those living along the path of the Pungwe-Mutare pipeline.

- **Transect surveys:** Those in Dangamvura and Sakubva conducted transect walks whereby every fifth house in a given area was selected out for a formal interview. Once interviews were complete, photographic surveys were made of the transect walk areas. Details of these are available in the M.Phil. theses.
- **Focus group discussions:** Discussions with various groups were held when and as they were possible. These were conducted mostly on an ad hoc or opportunistic basis.
- **Use of primary and secondary data:** All students conducted resource library searches, acquired unpublished studies made available to them from key informants (e.g. donor reports), and used various forms of primary data (e.g. minutes of various Catchment and Sub-Catchment Council meetings; minuted reports of workshops attended by students or those conducted by the SCC Training Officer, data collected by Van der Zaag's engineering students who were studying water losses in Mutare/Sakubva).
- **Use of situations in an ad hoc and opportunistic manner:** While in the field, several times opportunities arose where in the course of conducting an interview, for example, researchers subsequently found themselves invited to attend as observers meetings regarding water resource management in the study area (e.g. a Manicaland-wide project workshop on Integrated Rural Water Supply and Sanitation, a closed meeting of key stakeholders in a disputed water supply project moderated by Africa University officials).

All students kept **daily journals** vetted by one of the project principals on a weekly basis. For those students in Sakubva and Dangamvura, twice weekly **debriefings** were held at the head office of the peer education programme. These debriefings took the form of focussed, roundtable discussions designed in the main to gauge progress, to sort out problems, to discuss method, and to help students put their daily experiences into some sort of theoretical and philosophical frame. One of the project principals accompanied students on transect walks of Sakubva and Dangamvura during which photographs were taken. For those students conducting research on institutional reform, debriefings were held also on a twice-a-week basis or upon the direct request by the student researcher.

4.8.1 Limitations of data collection methodology

While it is recognised that the data was amassed in an ad hoc, opportunistic, or structured but unscientific way, it may be said with some confidence that the breadth and scope of the various data suggests that observations made here and in those papers published elsewhere as a result of this research are an accurate account of the primary issues, challenges, problems and possible solutions extant in the study area.

4.9 Workshops

All papers written as a result of this project have been workshopped in the region and elsewhere in a wide variety of forums (see Appendix 2).

CHAPTER 5:

TRACK 1 RESULTS:

INSIGHTS FROM THEORY

5.1 Water, Conflict and Security

Since the fall of the Berlin Wall, a great deal of global thinking has centred on the concept of 'security'. In the absence of Cold War induced 'stability', many asked, what does it mean to be 'secure'? Whereas the discourse within the world's state houses continued to focus on issues of balance of power, several strong counter-narratives emerged to challenge the assumptions that states were the primary referent of security, and military power the primary means by which to make a state – and by extension, citizens – 'secure'. A plethora of ideas regarding the referent (humanity, earth), the means (common, collective, multilateral, regional, community-based), ends (human dignity, planetary sustainability), and different impacts (on women, the South, planetary biodiversity, children) of 'new approaches' to security resulted in a decade of creative research at local and global level (Swatuk, 2002; Swatuk and Vale, 2000; Thompson and Swatuk, 2000).

In particular, the environment emerged as a central concern of academics, policy makers and global publics. Driven by a combination of high profile UN conferences and commissions (the Rio 'Earth Summit', the Brundtland Report), and generalised popular anxiety regarding the findings of numerous scientific studies (ozone depletion, acid rain, toxic waste disposal, biodiversity loss, global warming), the 1990s was dominated by discussions of 'environmental change and security' (Dalby, 2002).

Inevitably, these 'alternative' approaches to studying security filtered into and were refracted by already dominant security establishments. Having lost the defining narrative of the Cold War, Western militaries considered environmental degradation and resource scarcity as possible replacements.

5.2 Environmental security and resource scarcity

To this end, security establishments latched onto the research project coordinated by University of Toronto Professor Thomas Homer-Dixon. In brief, Homer-Dixon and associates hypothesised that a combination of increasing population and declining finite resources was a potentially deadly mix. Case studies were drawn mostly from countries already suffering 'acute conflict'. While Homer-Dixon and colleagues (Homer-Dixon, 1994; Homer-Dixon and Blitt, 1998) were unable to demonstrate any causal links between environmental degradation and violent conflict, they did usefully articulate the links between change and scarcity. According to Homer-Dixon and Blitt (1998: 1-2), environmental scarcity is a consequence of the depletion of renewable resources such as

forests, soil, lake and river water and the stratospheric ozone layer. They provide both goods (fish, plants, water) and services (fertile soil within which plants root and grow, carbon stores, pollution filters), with numerous interlinkages.

Scarcity, Homer-Dixon states, can come about in one of three ways: as a result of increased demand (demand-induced); as a result of decreased supply (supply-induced); or as a result of unequal access to and distribution of these resources (structural). These push and pull factors are said to often coexist. In the event of scarcity, two processes are set under way:

- resource capture by those with the means to do so
- economic marginalization of those without those means

According to Homer-Dixon, either a society adapts to these changes or it fails to do so (there is no middle ground). Failures manifest themselves in one of three ways:

- (i) market failure;
- (ii) social friction;
- (iii) capital availability.

Market failure results in the continuing overexploitation of a resource. In Homer-Dixon's estimation, it is markets based on communal structures (erroneously identified as 'open access') and state regulation (implying subsidies) that fail. Social friction implies that coalitions within states will react narrowly and parochially to scarcities rather than in the 'common good' of all citizens. This will exacerbate tension within a society. Capital availability concerns both human and financial resources. A plentiful stock of both provides a society with the capacity to be creative in its responses to scarcity. In his words, both forms of capital 'tend to be in short supply in these countries'.

Society's failure to adapt results in one or more of the following five social effects:

- (i) constrained agricultural productivity;
- (ii) constrained economic productivity;
- (iii) migration;
- (iv) social segmentation;
- (v) disruption of legitimate institutions.

To be fair, Homer-Dixon cautions all those intent on identifying a causal chain:

Environmental scarcity is not the sole or sufficient cause of these social effects; rather, it interacts with various contextual factors to cause these social effects. Contextual factors range from the nature of relations among ethnic groups to the state's degree of autonomy from outside pressure groups' (in Homer-Dixon and Blitt, 1998: 9).

However, it seems that state- and policy-makers are more persuaded by the image of mass migration, ethnic conflict and state failure than they are about Homer-Dixon's cautious conclusions regarding the causes of violent conflict. And far from water wars, these conflicts in Homer-Dixon's estimation are likely to be diffuse, persistent and sub-national in character.

Resource capture and economic marginalization are rife throughout the African landscape, particularly the rainforests of West/Central Africa - from where several of Homer-Dixon's case studies originate. The result, as Van DeVeer and Dabelko (1999) tell us, has been the 'securitising of the environment rather than the greening of security'.

5.3 Water Wars

Central to the 'resource wars' hypothesis is water. Along with a variety of non-renewable resources - e.g. oil, diamonds - water shortage is widely regarded as a potential catalyst for violent intra- and inter-state conflict.

Global worries regarding 'environmental security' have filtered down to the regional level, particularly in the form of 'water wars' (Ohlsson, 1995; Hudson, 1996, Green Cross International, 2000). One of the 'facts' motivating the regional water reform process is the following claim made by South Africa's Water Research Commission in 1994: 'South Africa will run out of water between 2020 and 2030 unless measures to combat the shortage are taken' (quoted in SAIRR, 1994: 1). Pallett *et al* (1997: 44-5) claim that Botswana, Malawi and Namibia exist in conditions of 'absolute water scarcity', while South Africa and Zimbabwe suffer 'water stress'. These 'facts' preface virtually all academic and policy writing on water and/or environmental security in the region.

5.4 Crude Science

The scientific measures supporting these truth claims are internationally derived. For example, European scholar Malin Falkenmark (1986) established the benchmarks for water stress -- more than 600 people per 'flow unit' (equal to 1 million cubic metres) -- and 'absolute water scarcity' -- more than 1,000 people per 'flow unit'. According to this measure, in 1995 there were said to be 4,257 people per flow unit in Botswana, 1,500 in Malawi, and about 1,200 in Namibia. However, after reciting these 'facts', Pallett *et al* themselves point out that these statistics are a crude measure which neither distinguishes between total run-off or available run-off, nor accounts for groundwater resources or water available from lakes -- hence the clearly misleading figures for Botswana and Namibia, which derive most of their freshwater from groundwater sources, and for Malawi, whose major source of freshwater is Lake Malawi.

Moreover, a significant portion of Falkenmark's water allocation is given over to irrigation, yet the vast majority of food produced in both Southern Africa and the world uses not extractions from flowing blue water (the basis for the 'water stress' measure) but green water. To quote Rockström (2001: 72-3):

[T]he world is largely green, i.e. 70% of the countries depend primarily on green water flow (return flow of vapour in rainfed agriculture) to sustain food production. The conclusion is that conventional freshwater assessments compare apples and pears, i.e. blue water availability, with a general human water requirement index (the 1700 cubic metres/cap/yr) that, for the largest part, in most countries of the world, is covered by direct return flow of vapour in rainfed agriculture, rather than from bluewater withdrawals.

Lastly, throughout Southern Africa the vast majority of freshwater – in the order of 50-70% of all water used – is used by irrigators, most of whom are producing not food crops for local consumption, but cash crops for export. If there is a freshwater shortage, should not current allocations be the subject of interrogation? Pallett *et al* (1997) suggest that, were better methods put into use, current levels of irrigated agricultural production in the region could be sustained while using a fraction of the present amount of water. Why, then, are these things not being done? Of course these are rhetorical questions. The point is to show how global narratives get imported into the SADC context and, without question, sometimes become the basis upon which future policy is made. The point is also to demonstrate that there are other ways of framing these issues. As Newson points out (2000), the successful application of water demand management measures would see many of these scarcities simply fall away.

5.5 Critical Theoretical Insights

5.5.1 Key themes in our project

Several themes regarding theory recur in the writings and publications associated with the project.

- **Knowledge and Power**

At the heart of our project is the recurrent theme of the ineluctable relationship between knowledge and power. Put simply, throughout time people with power have recorded history and commissioned and counseled the course of the production of 'knowledge'. With regard to the 'water wars' hypothesis, it is clear that state-makers are most interested in water as a productive resource in the making and maintenance of the state (Swatuk, 1997). As such, their first concern about this resource is adequate volumes for national development. National development continues to be equated with modernization, in particular, industrial development and energy production. As we argue below, this conflation of water and power has resulted in very specific forms of use and ways of thinking about the place of water in the creation and defence of the state. Most centrally, in terms of knowledge production and policy-advice, it has resulted in the tying of water most closely to the interrelated discourses of state security and modernization (Swatuk and Vale, 2000 and 2001). It has also meant privileging expert knowledge based on scientific 'fact' (Thompson, 2002).

All of these ways of thinking are problematic for the sustainable use of water resources in the SADC region. In a region where surface water regularly forms an international boundary, and where all water resources are shared resources, beginning to think about water resources management from 'national development' and 'state security' framings of reality and necessity can only create more problems than it can resolve.

- ***Reflexivity and Critical Thinking***

To ensure that 'water wars' do not become a self-fulfilling prophecy, we argue against the continued framing of water as a resource of national power requiring first and foremost protection by and for the state (Swatuk and Vale, 2000). This discourse is most prevalent in relation to writings on the Middle East - a perspective unhelpful in the extreme, especially when taken together with the Homer-Dixon school of resource scarcity and violent conflict (Klare, 2001).

Moreover, by locating environmental change within states or regions of the global South, the discourse on environmental security engages in victim blaming. We have sorted 'our problems'; you must now sort 'yours'. We are prepared, at most, to provide technical assistance. Unhelpful binaries of inside/outside, modern/traditional, ordered/chaotic are replete in this discourse (Dalby, 2002).

5.5.2 Toward Change

- ***A Change of Thinking***

If we leave these issues to *state-makers*, particularly in areas fraught with underdevelopment and inter/intra-state violence, we end up with resistance to change or policies following along lines of least resistance. Even in largely arid countries like Botswana and South Africa, there is little proactive thinking at the policymaking level in the way of fundamentally restructuring our cognitive and technical approaches to the 'environment' in general and water in particular. In the case of South Africa, industrial and agricultural 'development' requires water, and more of it. Supply side oriented policies continue to dominate the agenda, despite the increasing prevalence of 'water demand management' language in policy making circles. In the case of Botswana, as long as diamond-fuelled water transfer schemes can provide diamond-subsidised water to urban voters and rural patriarchs, the real cost of water is unlikely to be realised.

If we leave these issues to *technical 'experts'* we end up with parochial perspectives and prejudged agenda: in other words, policy that grows out of extant institutional perspectives be they militaries or engineering firms. In the case of the former, water is a resource to be secured for the state and its citizens. In the case of the latter, water is a factor of production that must be moved from A to B.

If we leave these issues to *academicians*, we end up with too many words and not enough action. If these academicians are critical theorists, these critiques are not always reducible to policy decisions. No matter how valid our critique of the state and sovereignty in the

Southern African context, we are still left with the fact of states and the need to deal with unequal distributions of resources (Swatuk, 2003c).

At minimum, and as critical theorists, we counsel against the conflation of ‘environment’ with ‘security’. National security, in particular, and as Deudney pointed out a decade ago, is structured around organised violence. Thinking about environmental challenges must be rescued from the technicist experts and militaries arrayed around the state. It must, instead, be located within a discourse of ethics, both global and environmental (see Leopold, 1948).

- *A Change in Language*

Discourses around ‘human security’ and ‘human development’, of ‘our global neighbourhood’, begin to address these issues in a necessary and holistic way. Water, for example, cannot be treated as an issue separate from any other. Adequate freshwater resources cannot be secured in the absence of a holistic framework which embeds water within its ecological, social, and politico-economic contexts. The concept of ‘river basin security’ is a step in the right direction (SIWI, 2003; Swatuk and Van der Zaag, 2003). However, ‘developed’ countries must not be seen to the bearers of ‘answers’. They are more accurately described as ‘high-consumption’, ‘resource hoarding’, and ‘water wasting’ parts of the world. The expertise they bring to the South is borne by arrogant industrialists and urbanists whose point of departure is the temperate zone, not the tropics. Nevertheless, post-World War II apartheid engineers fully embraced the universalist discourse of ‘development’. While the consequences of this love affair are only too well known, they nevertheless may be summed up in one word: homelands.

Conceiving of water as one of many resources to be secured for (industrial, neoliberal) development concedes the high ground to militaries keen on preserving access to this resource and engineers keen on wielding the violence of anthropocentric science to solve ‘shortages’. As such, those most keenly affected by economic inequality are moved further from the centre of the discourse around ‘water’: rural women of the South. For the vast majority of Southern Africa’s peoples, to speak of water means to speak of survival. For statemakers, however, to speak of water is to speak of power: power to fuel (dirty, resource wasting) industries; power over others. Indeed, in the case of Lesotho, water means the ability of statemakers to play at the fiction of sovereignty: to enter into international agreements for its sale, and to earn desperately needed foreign exchange. Yet, the Highlands Water Project displaced many people for whom water, particularly in relation to land, is a question of survival.

- *A Change in Focus*

A neoliberal understanding of the ‘self-regarding individual’ is not the only way of arriving at ‘sedimented virtue’, particularly within the context of states as the only form of community in international affairs. To do so is to display ‘a startlingly impoverished geopolitical imagination’, to quote Dalby (1998). Humans are not so much rational as they are relational. To be sure, it is the fact of our humanity that binds us all together: not

as self-maximizing economic ‘men’ who regard ‘nature’ as apart from us, as a composite of resources to be infinitely exploited; but as individuals who are themselves made up of 85 per cent water and who must exist as part of a bewilderingly complex biosphere. It is a step in the right direction to remember that we are ‘of’ the earth and not simply ‘on’ it.

If water is central to our humanity, it is also central to ecosystem sustainability. This term, ‘ecosystem sustainability’, we feel, is to be preferred to the dominant ‘environmental security’. A focus on environmental security reinforces the binaries known/other, and control/chaos. Witness the articulation of the 2000 floods in the popular imaginary: ‘raging waters’, ‘nature’s fury’. Water, therefore, is something to be both feared and controlled. We stand apart from it and watch as it wreaks havoc on our otherwise ordered world. We call in the military to help us rescue those stranded by flood waters. We mobilise the state in order to supply food and clothing for those left without.

To be sure, the recurrent heavy rains exact an equally heavy toll in the region. But, these rains, like drought, are natural processes, part of the rhythm of the regional ecosystem. It is largely the superimposition of neo-modern processes that create the architecture of disaster. Building neo-Europes in the sub-tropics or in (semi-)arid zones is a form of ecoimperialism, to twist a popular term. Southern Africa, to belabour a point, is an area of the world where human settlement patterns have developed since the 19th Century to serve European interests. To take one poignant example: in several of the major cities – Bulawayo, Harare, Windhoek, Johannesburg – water to fuel industry and urban consumption is actually pumped uphill. These cities have developed as part of the colonial/settler defense of privilege: as sites of mineral exploitation; as high points of defense. As they have grown, they face peculiar problems primarily because their existence slots awkwardly into regional biotic communities. Moreover, to satisfy their growing ‘thirst’, the regional ecosystem is further disintegrated via ‘water management’ schemes.

Clearly, these cities are not going to go away. Their problems must be dealt with. A viable beginning, however, is to locate our understanding of water within the context of regional ecosystems, hence our desire to begin thinking about ‘river basin security’ in service of ‘ecosystem sustainability’ (Swatuk and Van der Zaag, 2003). Secondly, we must acknowledge the extreme peculiarity of urbanisation in Southern Africa. Extant and increasing urbanisation does extreme violence to the regional ecosystem. Ironically, then, the early modernists were right: civilisation is separate from nature; but, if we are to arrive at sustainable solutions, we must put it back in.

- *A Change in Practice*

We can already hear the policymakers lament: ‘But what does this mean for practice?’ It is here that we hope our case studies contribute to practical ways of dealing with water resources management problems.

A shift to the language of ecosystem sustainability and human security may help us to begin to rethink our approaches to the region’s myriad problems. Articulation of the

integrated nature of regional ‘development’ – e.g. historicising and contextualising population flows – may help South African policy makers begin to recognise that as inhabitants of a common geographical space, and as primary architects of the region’s social space, ‘outsiders’ problems too often result from ‘insiders’ past practices (Vale, 2003).

Conceits of modernity are highly problematic, in particular the continuing belief that ‘man’ stands apart from nature. Dirty, dehumanising, destructive industrial practices based on the exploitation of wasting assets in the region must change. Similarly, the nature of the state must be problematised. To continue to think of South Africa as the ‘most developed’ state in the region is to fall prey to the disintegrating language of Westphalian communities (Swatuk and Vale, 2001). Within this narrative, South Africa becomes the ‘expert’ in problem solving. Its needs (to satisfy industrial output) take primacy. It is ‘better placed’ to achieve NIC status, etcetera. There is no better example of South Africa’s place in the state making imaginary than the media treatment of Mozambique’s devastating floods of 2000. Reporting has focussed almost solely on what South Africa is doing for these poor, backward neighbours. Once again, the ‘expert’ stands apart unless he is called in. The point has been made above: as humans are of the earth, not simply on it, so too is South Africa of the Southern African region, not simply in it.

While all of the region’s statemakers trade heavily on the myth of the Westphalian state, it is Botswana, Namibia and Zimbabwe (BNZ)– along with South Africa – who are better placed to create an approximation of this state form. Mineral wealth in Namibia and Botswana, and (now largely residual) industrial strength in Zimbabwe encourage state makers in these countries to build boundaries, not bridges between neighbours. Given the evidence of failed state-building projects throughout much the rest of the region, it is perhaps understandable that elites in BNZ and South Africa are so inclined.

However, these state-building projects rest on late-20th Century neoliberal capitalist assumptions: the familiar combination of economic structural adjustment and democracy by simple majority. Within this framing, the ‘environment’ is a smorgasbord of resources to be harnessed as factors of production. In combination, they comprise the basic ingredients of (economic) ‘development’. How likely is such a project to succeed? Given Southern Africa’s insertion at the margins of global economic processes, the answer is ‘not very likely’. Compare the case of Russia. In spite of the injection of billions of dollars by the West into the state-building and democratisation ‘project’, ‘[t]he number of people in poverty has increase from 2 million to well over 60 million over the 1990s. By 2000, it is expected to reach 20 per cent of the population’ (Thomas, 1999: 228).

If ecosystem sustainability and human security are to be realised in Southern Africa, we must move away from modernist assumptions of autonomous states pursuing independent projects along a linear path of progress which sees them at different ‘stages’ of industrial development. In terms of South Africa’s stated foreign policy goals, being a ‘voice of the South’ suggests recognition of the continuing problem of ‘divide and rule’. How this translates into action, however, is another issue. Clearly, however, if we are to move

beyond the status quo of debt, underdevelopment, resource plunder and elite privilege, state makers will need to abandon policies that rest on exclusivity. Southern Africa is home to multiple localities who have multiple interests and possess multiple forms of knowledge. These must be privileged.

This means, at minimum, moving away from continuing dependence on and deferment to technical experts, be they water engineers who 'know' how to improve supply or defence experts who 'know' how to guarantee continued access to resources. Men in suits and lab coats do not have all the answers. Indeed, it is these same 'men' who have gotten us into this muddle in the first place (Swatuk, 2001). Some humility in the face of biosphere complexity is useful when thinking about issues of human security and ecosystem sustainability. This includes recognition that sometimes solutions are to be found among those least visible and least respected in 'development': rural farmers, most of whom are women.

What all of this suggests for practice may be summarised along the following lines.

1. We must move toward conceptualisations of natural resources that locate humans within the system itself and acknowledge the complex and highly integrated nature of 'nature'. While we remain skeptical regarding our capacity to 'manage' nature, we do acknowledge that approaches which commence from complexity (e.g. Integrated Environmental Management Systems) rather than simplicity (water = factor of production; land = factor of production) are to be preferred.
2. We must move toward local understandings of environmental processes and away from the denigration of local/rural knowledge. This therefore presupposes putting people back into the search for adequate water supplies – water for survival not narrowly for power. In terms of action, this involves broadening the dialogue considerably. Expert forums that privilege state makers, academics, engineers and defence specialists reinforce not only narrow understandings of natural resources, but of 'the natural'. In this reading, both fearsome nature and rural peoples who exist 'more closely to nature' are to be brought under modernist control. Participation on equal terms is simply out of the question. In determining who to engage in discussion – i.e. who is a stakeholder, to use a somewhat problematic term—the ecosystem should be the measuring stick, not the state. We have made the point elsewhere: we must attempt to reconceive of water in the region as life giving arteries, not death legitimating boundaries (Swatuk & Vale, 1999). The multilateral turn toward River Basin Management and the creation of Catchment Councils is a positive development. However, expert knowledge, narrowly defined, continues to dominate these forums – as it is inter-state, agro/industrial, and engineering oriented. In other words, it too often continues to operate from definitions of 'water as power' (Dube and Swatuk, 2002). We do the region a disservice by working toward the creation of several solitudes. Local NGOs and Community Based groups, variously funded think tanks, individually driven university research projects, government departments, IOs and INGOs, are too regularly working in isolation from each other. Sadly, this is most often the result

- of ego, ideologies and the jealous hording of funds, not simple ignorance. We must work to overcome these parallel practices: the annual Warfsa/WATERNET meeting is an important move in this direction.
3. We must recognise the integrated nature of 'development'. In getting away from segmented perspectives and approaches we may begin to see that 'problems' in one area (urban water supply and sanitation) may resolve themselves if adjustments are made in another area (profligate defence spending). For example, at global level, debt obligations and SAP conditionalities too often exacerbate environmental degradation. Debt forgiveness and fair trade would go a long way toward alleviating 'environmental scarcity' (SADC, 1996). At regional level, vigorously upholding 'polluter pays' principles and working toward 'cost internalisation' in production processes would vastly improve both the quantity and quality of resources. In terms of water resources, the turn toward both demand management and progressive water pricing is particularly hopeful.
 4. This final point we make with great trepidation, for we are well aware of the seemingly limitless capacity of militaries to perpetuate themselves after the Cold War in a remarkably unhindered way. If militaries must be involved they must be willing to be led and not lead. The region could benefit greatly from what might be termed a 'regional environmental brigade'. We recognise the great resistance to this within military establishments. As stated elsewhere, guarding turtles is seen to be beneath the dignity of the military (Swatuk & Omari, 1997). Yet, in terms of catchment management or basin management, there is a great deal of work to be done. This may be one case where ecological metaphors of security serve a useful purpose. Turning military resources toward the eradication of alien species, invader bushes, and the like is both necessary and highly respectable. It is not too late to recover the peace dividend.

5.6 Reframings

Like Homer-Dixon's, ours is a normative agenda. It is one which seeks to foster the language of cooperation, integration and inclusion. We wish to restate what we feel to be one of our central points: that water is more than simply a factor of production to be moved from A to B. It is more than one of many fragmented resources to be secured through violence. We must move toward a conceptualisation of water which locates it as a key element in the complex web of ecosystem survival, an element not only central but necessary to our humanity. We should resist the dominant discourse of water as power. Southern Africa is replete with examples of activities that grow out of such positive, inclusive forms of thinking. We must build on their example.

CHAPTER 6: RESULTS:

BACKGROUND TO THE EMPIRICAL CASE STUDIES: WATER RESOURCES

USE IN THE SADC REGION

6.1 Introduction

As highlighted in the Methodologies chapter above, we undertook a desk study of the state of water resources and reforms in the SADC region. The reasoning behind this was twofold. One, it helps locate current efforts at, for example, institutional reform in Zimbabwe, in its wider regional context, a context itself informed by developments at global level (see below). Two, it demonstrates quite clearly that regional thinking and action on water resources management is not being taken in expectation of coming ‘water wars’ – but that it is being taken in light of various crises regarding freshwater supplies and their potential for long-term negative impacts on the region. These negative impacts may take the form of conflicts between and among users. These conflicts may be exacerbated by poverty and underdevelopment and ultimately prove to be persistent, diffuse and sub-national. In other words, they may conform to Homer-Dixon’s more careful prediction (which is not to suggest, however, that his analysis of causation – i.e. the ‘ingenuity gap’ – is correct).

6.2 Relative Abundance and Socially Constructed Scarcity

Water resources are highly varied in Southern Africa. The region receives most of its water during the wet summer season (October-April) when rain arrives from the Indian Ocean. This is facilitated by the regular seasonal movement of the inter-tropical convergence zone (ITCZ). The majority of this water falls within 400 km of the east coast of the continent. In general, the region is better watered in the north and east, and much drier in the south and west, except along the southern coasts of South Africa (Tables 1 and 2). According to Conley (1996: 17), ‘The Zambezi River carries more than ten times as much water, and the Zaire [Congo] River carries more than a hundred times as much water as the Orange River in the south.’ In addition, the region is prone to both drought and flood, sometimes occurring simultaneously (Chenje and Johnson, 1996: 2).

TABLE 6.1: RAINFALL AND POTENTIAL EVAPORATION STATISTICS FOR SADC STATES

Country	Rainfall Range (mm)	Avg. Rainfall (mm) (cu.km)		Potential Evaporation Range(mm)	Total Surface Runoff (mm) (cu.km)	
Angola	25-1600	800	997	1300-2600	104	130.0
Botswana	250-650	400	233	2600-3700	0.6	0.35
Lesotho	500-2000	700	21	1800-2100	136	4.13
Malawi	700-2800	1000	119	1800-2000	60	7.06
Mozambique	350-2000	1100	879	1100-2000	275	220
Namibia	10-700	250	206	2600-3700	1.5	1.24
South Africa	50-3000	500	612	1100-3000	39	47.5
Swaziland	500-1500	800	14	2000-2200	111	1.94

Tanzania	300-1600	750	709	1100-2000	78	74.0
Zambia	700-1200	800	602	2000-2500	133	100.0
Zimbabwe	350-1000	700	273	2000-2600	34	13.1

Source: Pallett *et al*, *Sharing Water in Southern Africa*, 1997, p. 14.

There has been a great deal of scholarly and policy-oriented discussion regarding the coming ‘scarcity’ of freshwater resources in the region. This is true in a rather simplistic sense: given the fact of steadily increasing populations and an absolute amount of water, competition for a finite resource will increase with time. Certainly the region’s climatic systems, coupled with entrenched patterns of allocation and usage present a serious management challenge.

The extreme range of rainfall throughout the region, combined with high rates of potential evaporation (Table 6.1), distinct wet/dry seasons, and recurrent drought led European settlers/colonists to embark on numerous massive engineering projects – dam building, pipelines, canal systems – to ensure ‘water security’ throughout the year. This trend toward the application of technology to enhance supply was exacerbated by the desire to recreate Europe in Africa – first at the Cape of Good Hope, but, following the mineral revolution, in arid and forbidding environments much less hospitable to water-rich European ways. Throughout settler Southern Africa this has resulted in an abiding preference for supply-side solutions which privilege scientific and technical expertise – a pattern affirmed by post-World War II global trends in modernization.

Table 6.2 reveals what appears to be a contradiction: generally low per capita availability (suggesting water stress) but annual withdrawals as a percentage of total water resources generally below 5% (except for South Africa and Zimbabwe), suggesting relative abundance.

TABLE 6.2: FRESHWATER RESOURCES IN SADC STATES

Country	Average Annual Internal Renewable Water Resources		Annual Withdrawals			Sectoral Withdrawals		
	Total (cu.km)	Per Cap (cu.metres) Yr2000	*Total (cu.km)	% of water resource	per cap (cubic metres)	Domestic	Industry	Agric
Angola	184.0	14,288	0.48	0	57	14	10	76
Botswana	2.9	1,788	0.11	4	81	32	20	48
Lesotho	5.2	2,430	0.05	1	31	22	22	56
Malawi	17.5	1,605	0.94	5	98	1	0	99
Mozambique	100.0	5,081	0.61	1	40	9	2	89
Namibia	6.2	3,592	0.25	4	185	29	3	68
South Africa	44.8	1,110	13.30	30	391	17	11	72
Swaziland	--	--	--	--	--	--	--	--
Tanzania	80.0	2,387	1.17	1	40	9	2	89
Zambia	80.2	8,747	1.71	2	214	16	7	77
Zimbabwe	14.1	1,208	1.22	9	136	14	7	79
DRC	935.0	18,101	0.36	0	8	61	16	23

*year of data varies

Source: World Resources Institute, *World Resources 2000-1*, pp.276-77.

Clearly, South Africa, with annual withdrawals estimated at 30% of total water resources, faces serious questions regarding the best-use of those resources. To quote Conley (1996: 19):

South Africa at present represents an example of a country which has reached a stage in its development where its scarce water resources will have to be allocated increasingly to the most worthwhile purposes only. It has become necessary for each water use to warrant the cost of providing the water.

6.3 Regionally Shared Resources

However, what Table 6.2 fails to reveal is the fact that much of the region's water resources are derived either from rainfed aquifer recharge (for example, Botswana derives approximately 80% of its water from groundwater sources), or from *transboundary* river systems.² Perhaps the most significant legacy of colonialism/imperialism in the region, after mineral exploitation, is the creation of state borders that either arbitrarily cut across or conveniently used as lines of demarcation the region's numerous waterways. As a result, there are at least 15 internationally shared river basins in the SADC region (see Table 6.3)

TABLE 6.3: INTERNATIONAL RIVER BASINS SHARED BETWEEN SADC STATES

BASIN	BASIN STATES	SPECIAL FEATURES
Buzi	Mozambique, Zimbabwe	2 small hydropower installations in Mozambique; 1 of the dams also used for irrigation
Cunene	Angola, Namibia	potential hydropower of 2,400 MW; 4 dams in Angola; 1 in Namibia controversial because of impact on indigenous people (at Epupa gorge)
Cuvelai	Angola, Namibia	low and erratic run-off; 40 dams built to provide water for agriculture, livestock, and about 50% of Namibia's people; inter-basin transfer from Cunene to Cuvelai
Incomati/ Nkomati	Mozambique, South Africa Swaziland	22 large dams in catchment with 2 more in progress; several international operating agreements; clear indications that natural flows in dry season greatly reduced through abstractions
Limpopo	Botswana, Mozambique, South Africa, Zimbabwe	4 dams in Botswana, 1 in Mozambique, 26 in South Africa, 9 in Zimbabwe; transfrontier national park planned in basin;
Maputo/ Pongola	Mozambique, South Africa Swaziland	5 dams in South Africa, 4 in Swaziland, 1 in Mozambique; important water source for population of Southern Mozambique; much flow diverted by SA and Swaziland

² Research at the Centre for Scientific and Industrial Research in South Africa has recently revealed the transboundary nature of most of these large underground aquifers (personal communication).

Nata	Botswana, Zimbabwe	partly ephemeral; considered to be of little international significance
Okavango	Angola, Botswana Namibia	Endoreic River system designated a World Heritage site; planned off-take near Runde to bring water to Windhoek; Draft catchment management plan recently completed; potential peace in Angola could lead to upstream development
Orange	Botswana, Lesotho	most over-developed river in region with 24 large dams in South Africa, 5 in Namibia and 2 in Lesotho; numerous intra- and inter-basin transfers; Location of controversial Highlands Water Project
Pungwe	Mozambique, Zimbabwe	off-take of 0.7 cumecs near headwaters in Nyanga National Park Mountains brings water to Zimbabwe city of Mutare; Sugar plantations, National Park, city of Beira dependent on downstream flow
Rovuma	Malawi, Mozambique Tanzania	no significant development made or planned
Save River	Mozambique, Zimbabwe	Osborne dam in Zimbabwe unused at present; Sugar plantations in lowlands in Mozambique; Provides 20% of Mozambique's surface water; Supports Highest density of rural Zimbabwe population; Chimanimani and Gonarezhou national parks in basin
Umbeluzi	Mozambique, Swaziland	2 dams in Swaziland, 1 in Mozambique
Zaire/Congo	DRC, Angola, CAR, Cameroon, Tanzania, Zambia	potential Hydropower development at Inga Rapids with 34,000 cumecs at high flow; is main 'road' in DRC; potential 45,000 MW largest hydroelectric energy project in world
Zambezi	Angola, Botswana, Malawi Mozambique, Namibia, Tanzania, Zambia, Zimbabwe	4 th Largest river basin in Africa; supports 20m or 30% of total population of basin countries; 1 st UNEP EMINWA project led to ZACPLAN then SADC water protocol; 2 dams in Malawi, 5 in Zambia, 12 in Zimbabwe, 1 in Mozambique; numerous developments planned (more hydropower; inter-basin transfer pipelines; irrigated agriculture), some of controversial nature

Source: Adapted in part from Ohlsson (1995: 51-2) and Conley (1996: 24-55).

Usage of these waterways has, historically, proceeded along the lines of either unilateral exploitation of the resource within national boundaries or exploitation based on a bilateral or multilateral agreement signed by the basin states. Usually these agreements have been single issue oriented, i.e. regarding water transfer, storage and use by agriculture (an irrigation scheme), industry (hydropower), or primary consumption (an urban population). Until very recently there has been little attempt to rationalise or coordinate the impacts of these many and various agreements either within a specific basin or in terms of broader regional sensibilities.

6.4 Current Allocations

Throughout the region, irrigated agriculture (50-70%), industry (10-15%) and mining (3-12%) consume the lion's share of water resources. These percentages reflect not only

historical colonial/settler priorities, but also post-colonial continuities, in the South African case exacerbated by apartheid social engineering.³

Allocations which favour irrigated agriculture, mining and industry lead to waste due to inefficient use and high state subsidies – in some cases the water is free; in many cases it is severely underpriced – to widespread pollution due to the inability to police the ways in which (toxic) waste is disposed, and to a decline in the overall quality and quantity of the resource due to agro-industrial practices, particularly for downstream users.

For Bate and Tren (2002:91), in South Africa ‘water allocation has favoured the dominant power – initially the DEIC [Dutch East India Company], and for the past 200 years, agricultural interests’. The same can be said of all SADC member states. Socially equitable solutions to socially constructed water scarcity in Southern Africa means confronting very powerful vested interests. For example, current arguments for reallocations away from this sector highlight the fact that farms enrich a small class of whites while contributing little to GDP.⁴ However, agriculture not only creates massive wealth for the few, but employment for hundreds of thousands of labourers – on sugar cane, coffee and citrus plantations, wine and tea estates, in the forestry industry. Moreover, well-paid mine labour supports a complex extended family network. Thus, water managers have begun to turn their attention to questions of efficiency, user-pay fees, and incentives for conservation rather than reallocation.

Given that so much of the region’s water resources are shared among countries, there is the added incentive that more efficient upstream use – including pollution controls – improves relations with downstream states, communities, cities, farms and individuals.

6.5 Rural/Urban Issues

It should not be surprising that access to fresh, potable water and water-based sanitation systems reflects the historical inequalities of the region. The figure of 13% of the (white) population controlling 85% of the land in South Africa is only too well known: as with land, so with water; and, as with South Africa, so with the region. Thus, national trends as presented in Table 6.4 below, while a good indicator of the state of delivery in the region, mask the facts of intra-national disparities. Moreover, there are rural/urban, sex, class and race aspects to inequalities of access, with poor, black females in rural areas, for example, being most likely to lack access both to potable water and adequate sanitation. Table 6.5, although presenting data that is now 8-10 years old, nevertheless gives some idea of the disparities in access between rural and urban users. Moreover, anecdotal evidence suggests that the percentage of people with access to safe water and sanitation, save for perhaps Botswana and Namibia, has declined throughout the SADC region.

³ Botswana is sometimes said to be an exception. With little arable land, only 15% of water resources go to irrigation and forestry. Combined with livestock (23%), however, farming activities may be said to account for the majority (i.e. 38%) of water resources use. This is followed by urban centers (24%), mining and energy (18%), rural centers (17%), and wildlife (3%) (Government of Botswana, 1997: 280).

⁴ In Namibia, for example, irrigated agriculture is estimated to use 43% of water resources but only contribute 3% to GDP. In South Africa, agriculture contributes an estimated 6% to GDP. (see Pallett, 1997; Bate and Tren, 2002).

TABLE 6.4: SADC STATES' ACCESS TO CLEAN WATER AND SANITATION

Country	Total Pop'n (millions)		Growth Rate %		% Population without access to safe water sanitation	
	1999	2015	'75-'99	'99-'15	1990-98	1990-98
Angola	12.8	20.8	3.0	3.1	32	---
Botswana	1.5	1.7	2.9	0.7	10	45
Lesotho	2.0	2.1	2.1	0.4	38	62
Malawi	11.0	15.7	3.1	2.2	53	97
Mozambique	17.9	23.5	2.3	1.7	54	66
Namibia	1.7	2.3	2.7	1.8	17	38
South Africa	42.8	44.6	2.1	0.3	13	13
Swaziland	0.9	1.0	2.9	0.7	50	41
Tanzania	34.3	49.3	3.1	2.3	34	14
Zambia	10.2	14.8	3.0	2.3	62	29
Zimbabwe	12.4	16.4	3.0	1.7	21	48
DRC	49.6	84.0	3.2	3.3	32	---

Source: UNDP, *Human Development Report 2001*, pp. 155-6 and *Human Development Report 2000*, pp. 170-1

TABLE 6.5: RURAL/URBAN ACCESS TO CLEAN WATER AND SANITATION (1990-1995)

Country	Population with access to (%)			
	Safe Water		Sanitation	
	Rural	Urban	Rural	Urban
Angola	15	69	8	34
Botswana	91	100	41	91
Lesotho	49	70	36	53
Malawi	42	91	51	71
Mauritius	100	95	99	99
Mozambique	40	17	11	61
Namibia	42	87	12	77
South Africa	--	--	--	--
Swaziland	--	--	--	--
Tanzania	46	67	62	74
Zambia	11	91	12	75
Zimbabwe	64	99	48	99

Source: UNDP, *Human Development Report 1996*.

CHAPTER 7:

TRACK 2 RESULTS:

BACKGROUND TO THE CASE STUDIES: THE STUDY AREA

7.1 Physical Data

The length of the Pungwe River is roughly 400 km of which 340 km lies in Mozambique. The Pungwe River drains an area of 31,000 km², only 5 per cent of which is situated in Zimbabwe. Since this part of the basin receives generous rainfall, it contributes considerably to the Pungwe discharge (Figure 7.1).

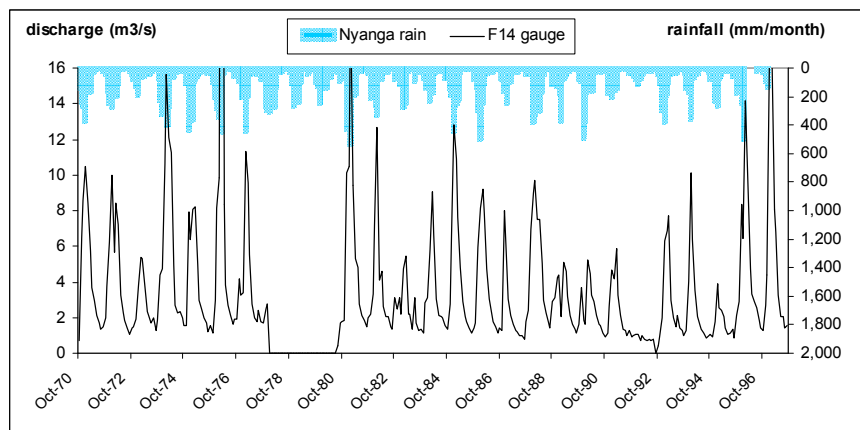


Figure 7.1: Monthly discharge and rainfall data; 1970-1997 at Pungwe Falls in Nyanga, Zimbabwe

The Pungwe River rises from the foothills of Mount Inyangani in Zimbabwe's eastern highlands, flows into Honde Valley where it crosses into Mozambique. This part is considered the middle Pungwe, up to the point where at Bue Maria it reaches the plains, which is considered the lower part of the basin. Downstream of Bue Maria the river divides in several streams, of which the Dingue Dingue is the most important, because through it the main discharge in the dry period is transported. The streams join again near the bridge over the Pungwe River on the EN6 highway, which is situated some 100 km from the estuary mouth, in the zone under tidal influence. At the estuary the Pungwe waters enter the Indian Ocean. This is some 20 km north-east of the City of Beira.

The discharge at Bue Maria plays an important role in pushing back the salt sea water intruding through the estuary, which is crucial for the City of Beira's water supply intake. The 10% low flow (i.e. the flow with a chance of occurring of 0.10; with a return period of 10 years) at Bue Maria has been established at 8.8 cubic metres/second. According to

Zanting et al (1994), this is just about the limit to safeguard the intake of fresh water for Beira. According to Magara and Tapfuma (2000: 12), the 'water transfer for the Pungwe project has negligible effects on riparian users in Mozambique. Abstraction of water by the City of Mutare constitutes approximately 1% of Pungwe flows at E65 (gauging station in Mozambique), with the percentage decreasing as the river approaches Beira Port.

Unlike the Pungwe, a major portion of the Save (and its primary tributary, the Runde) River runs through Zimbabwe. The Save runs for approximately 740 km. Its catchment drains an area of 116,100 km², of which 84,500 km² (approx. 70%) is in Zimbabwe (Gleick, 2000: 233⁵). According to Matiza (1994: 1-2):

[In Zimbabwe], the catchment spreads over five administrative provinces of Manicaland, Masvingo, Midlands, Mashonaland East and Matabeleland South ... The catchment is comprised of 39% communal areas, 35% large scale commercial farming areas, 13% small scale commercial farming areas, 1.5% resettlement schemes, 1.5% state farms, 3.5% parks and wildlife areas and 6.5% forest reserves. About one-third and one-fifth of the country's communal lands and commercial farming areas are found in the catchment.

Pallett et al (1997: 88) identify 18 major dams in the basin, all in Zimbabwe. They range in size from 14 million m³ (Scorror, Muzhwi) to 401 and 1,425 million m³ (Osborne Dam on the Odzi River and the Mutirikwi Dam on the Mutirikwi River respectively). Rainfall varies widely throughout the basin – between 400 mm in the south and 2000 mm in the north east of the catchment in Zimbabwe, and between 600 in the west and 1000 mm in the east of the catchment in Mozambique.

Understandably, variations in rainfall mirror agricultural possibilities and practices throughout the basin. Both Mozambique and Zimbabwe are divided into five 'natural regions' or 'agro-ecological regions' (See Moyo and O'Keefe, 1993, for details):

- Zone 1: specialized and diversified farming
- Zone 2: intensive farming
- Zone 3: semi-intensive farming
- Zone 4: semi-extensive farming
- Zone 5: extensive farming

The Save catchment comprises all five of these natural regions in Zimbabwe and Zones 3-5 (with the bulk of the catchment being Zone 5) in Mozambique. The numerous and varied political jurisdictions and land use practices in the basin, combined with wide variations in climatic conditions, present people there with complex questions of efficient, equitable and sustainable natural resources management. According to Matiza (1994: 1), 'the environmental problems of the Save Catchment have been topical for a very long time'. Until the scouring effect of the floods of 2000, the river and its

⁵ Pallett et al (1997: 73) provide somewhat smaller figures for both the Pungwe and Save Rivers.

tributaries were heavily silted, with dry season 'flow' reduced to a series of pools and trickles.

7.2 Socio-economic characteristics of the basins

7.2.1 Pungwe Basin: Zimbabwe

Each basin presents a complex picture of resource allocation and usage. The part of the Pungwe River situated in Zimbabwe is relatively densely populated and substantially developed in terms of agriculture and tourism. It is likely that in future water consumption will increase further. Currently, the main water consumers in the upper part of the catchment are forest plantations of exotic trees which are well known to negatively and significantly affect river discharge; the City of Mutare; and tea and coffee estates near the border with Mozambique for irrigation. Other consumptive uses include smallholder irrigation and primary uses by communal farmers in the Honde Valley. It is likely that smallholder and estate irrigation development will continue, and that water demand for irrigation will increase. According to Magara and Tapfuma, 'Estimated domestic and irrigation downstream water requirements [in the Honde Valley], including registered water rights, are 0.29 m³/s. Nearly 60% of these requirements pertain to the Katiyo Tea Estates water right.'

The three principal non-consumptive uses in this part of the basin are national park/environment, tourism, and fisheries. The ecology of this part of the Pungwe basin is considered pristine. The Pungwe River hosts a variety of rare freshwater fish species such as the Mountain Catfish (*Amphilius uranoscopus*), Barred Minnow (*Opsaridium zambeze*), African mottled eel (*Anguilla bengalensis labiatal*), and the Pungwe chisel mouth (*Varicorhinus pungweensis*), among others. At the Pungwe Falls, the river supports spray dependent vegetation (Magara and Tapfuma, 2000).

The City of Mutare has some 180,000 inhabitants, and requires approximately 0.6 m³/s of water. It has two sources of water supply: the Odzani River (part of the Save basin), where two dams (Alexander and Smallbridge) impound water for Mutare (combined capacity some 20 Mm³), and the Pungwe River.

The impact of diverting 0.7 m³/s out of the upper reaches of the Pungwe is significant in this part of the catchment, amounting to some 16% of the mean annual runoff at the diversion point. The impact during the low flow season is much larger (35% of mean runoff during the lowest flow month, June). However, since at the border with Mozambique the discharge of the Pungwe is much larger due to the much larger catchment area (622 km² compared to 86 km²), here the impact is considered to be relatively small (some 3% of the mean annual runoff; though higher during low flow season).

This new source is considered sufficient to cater for Mutare's water needs up to the year 2015. However, some controversy exists on the risk of failure of the combined water sources of the city, i.e. lakes Alexander, Smallbridge and the Pungwe River off-take. The

risk of failure of the Pungwe River supplying $0.7 \text{ m}^3/\text{s}$ may be higher than previously assumed, and higher than the generally accepted 4% (Figure 7.2). Note that the intakes works are such that the agreement between Zimbabwe and Mozambique is honoured whereby Mutare may take out a maximum of $0.7 \text{ m}^3/\text{s}$ provided that always $0.5 \text{ m}^3/\text{s}$ is left in the river. Engineers have assured that the physical intake structure at the river intake as well as the regulation devices in the pipeline are such that it is impossible for Mutare to take out the first $0.5 \text{ m}^3/\text{s}$, as well as taking out more than $0.7 \text{ m}^3/\text{s}$ when river flow is about $1.2 \text{ m}^3/\text{s}$.

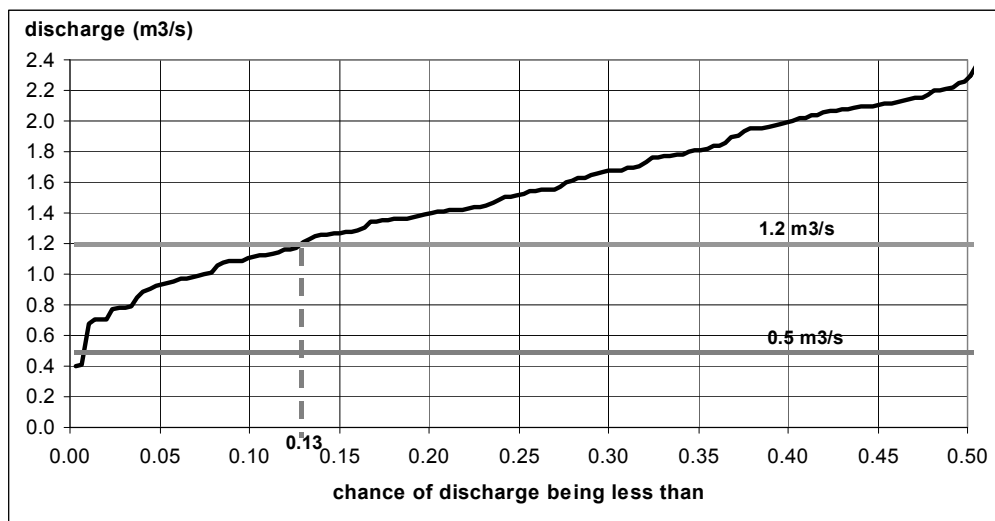


Table 7.2: Risk analysis of Pungwe river supplying $0.7 \text{ m}^3/\text{s}$ to Mutare based on monthly discharge data; 1970-1997 (gauging station F14; Nyanga)

In summary:

Non-Consumptive Uses:

- Nyanga National Park
- Tourism (canoeing; white water rafting; fishing)
- Fisheries (very limited)

Consumptive Uses:

- Rural water supply for primary use (including livestock watering and gardens) (amount not known)
- Water supply for the city of Mutare ($0.7 \text{ m}^3/\text{s}$)
- Wetland cultivation (amount not known)
- Smallerholder irrigation (amount not known)
- Forestry plantation of exotic trees (mostly pine, also eucalyptus and wattle; amount not known)
- Large-scale irrigation

- Katiyo Estate (government owned and managed by ARDA; water use not more than 1 m³/s)
- Aberfoyle Estate (owned by Eastern Highlands Plantation, a private company; water use not more than 1 m³/s)

7.2.2 Pungwe Basin: Mozambique

The middle Pungwe River Basin on the Mozambican side of the border is less densely populated, as many areas were abandoned during the civil war and the level of development is much lower than in the other parts of the basin. Little information currently is available concerning demography, land use, environmental and infrastructural conditions. However, a scoping exercise revealed a variety of activities.

The Gorongosa National Park is situated in this part of the basin. This used to be an important tourist attraction until it became the headquarters of RENAMO during the late 1980s. Currently, there are de-mining activities and attempts to rehabilitate the park, including restocking of game. The park itself is being encroached upon by smallholder agriculture, particularly in the northwest. Further down the river, in the Pungwe's flood plains, there are two major water users: the City of Beira and the Mafambissa sugar plantation.

As of early 1998, only 15-20% of the population of Beira was served with treated water, mainly because the system was developed during the colonial period for certain parts of the city only, much was destroyed during the liberation struggle and subsequent civil war, and little rehabilitation and/or maintenance has yet been carried out. The system suffers from very high leakages. It urgently needs to be rehabilitated and extended. There have been serious cholera epidemics in Beira, probably caused by the lack of coverage in combination with heavy flooding. There is no sewerage treatment facility in Beira – sewerage is let out through open channels directly to the sea; it also runs freely through the streets (Nilsson and Shela, 1998; personal observation).

The Companhia de Aguas da Beira (Beira Water Supply Company) abstracts about 0.3 m³/s from the canal supplying water to the Mafambisaa sugar plantation, fed from a pumping station on the Pungwe River. The pumps deliver 1.0 m³/s total discharge, and 0.7 m³/s is used on average for irrigating sugar cane over an area of some 3,000 ha. The intake is located within the 80 km long stretch of the river affected by saltwater intrusion during the dry season. Salinity levels are often too high for irrigation during a normal low-flow season (Zanting et al, 1994; Nilsson and Shela, 1998).

Beira plans to establish an industrial 'free zone' – i.e. an export-processing zone – north of the city, which would also use the Pungwe River for its water supply. The total use of water is expected to be 1.5 m³/s and the intake will be 5 km upstream of the present intake in order to avert salt problems at higher intake levels (Nilsson and Shela, 1998).

Excess water during the wet season is as much a problem as water scarcity during the dry season. Floods inundate extensive agricultural lands while damaging properties and

settlements. The floods of February 1998 displaced many people and affected 45% of sugar cane production at Mafambisse estate. Floods and water scarcity are together the limiting factor for expanding irrigation for sugar cane and rice. Out of 40 potential dam sites, the Bue Maria just west of the plains area is considered the best solution for solving the problems related to seasonal flow variations. The most important function of this dam would be to regulate the downstream flow in order to control salt intrusion, but it would also be used as a storage reservoir for irrigation, water supply and possibly hydropower (Nilsson and Shela, 1998).

One environmental concern in the coastal area is the dependency of prawn cultivation on brackish water conditions. Any drastic change of the Pungwe flow, including silt load, will have a detrimental impact on the habitat (Nilsson and Shela, 1998). The decimation of mangrove swamps for building poles is already negatively impacting on prawn production.

In Summary:

Non-Consumptive Uses:

- Gorongosa National Park
- Salinity control at the intake for City of Beira water supply near the estuary (8-10 m³/s required)
- Fisheries (amount not known)

Consumptive Uses:

- Rural water supply for primary uses (including livestock and gardens) (amount not known)
- Water supply for City of Beira (410,000 inhabitants in 1992 of whom only 15-20% connected to system; currently using 0.3 m³/s to increase to 1.5 m³/s)
- Wetland cultivation (amount not known)
- Smallholder irrigation (amount not known)
- Large-scale irrigation
- Mafambissa sugar estate with 2,620 ha (using 0.7 m³/s to increase to 5.5 m³/s for planned 8,500 ha)

7.2.3 Save Basin: Zimbabwe

There is great contrast between land use/development in the Save Basin both within Zimbabwe and between Zimbabwe and Mozambique. This, of course, reflects the changing topography: high rainfall of up to 2,000 mm in the upper catchment facilitates a great deal of water storage and irrigation activity throughout the middle Save in Zimbabwe. Rainfall decreases with altitude so also affecting climate and soils. Altitude varies from 1800m at Juliasdale where there are extensive tourist activities, trout fisheries, forestry, commercial and subsistence agriculture, to 1500m at the urban nodes of Rusape and Marondera, down to 300m at the exit point of the Save River from Zimbabwe.

The river rises in natural zones 1 and 2, passes through zones 3 and 4, and exits at zone 5. While much of the Save is located in zones 1-3, its major tributary, the Runde, runs mostly through zones 4 and 5. Land tenure forms reflect this run of river, with freehold (i.e. commercial farms) found mostly in zones 1-3, and communal areas in zones 3-5. While there are some areas of good soil in the lower Save, there is a serious shortage of water. At the same time, in the communal areas of the upper Save people have hopes of accessing stored water for irrigation – e.g. via the under-utilised Osborne Dam – but existing water rights have already been apportioned out.

While the Save River catchment encompasses roughly 11% of the country, it carries 25% of the total population of the country. According to Matiza (1996: 9),

The two river systems, the Save and Runde, directly support more than 3 million people, roughly split equally between them. Of the 3 million living in the catchment, 83% are concentrated in the communal lands in the upper catchment area. These areas are grossly overpopulated with densities exceeding the carrying capacity.

Matiza (1996: 22) summarises the associated environmental/social problems as follows:

- Excessive soil erosion and land degradation especially in the communal areas
- Severe deforestation leading to shortage of fuelwood and building timber especially in the communal areas
- Deteriorating water quality and quantity
- High population growth causing imbalances between population and available resources
- Land tenure systems encouraging poor management of natural resources
- Poverty and limited access to resources
- Lack of alternatives and appropriate technology
- Lack of coordination

It is not surprising that a great deal of the problems over land reform in Zimbabwe have taken place in the Save River catchment area.

In summary then:

Non-Consumptive Uses:

- National Parks (Chimanimani, Great Zimbabwe)
- Other tourist areas
- Fisheries, subsistence and sport fishing

Consumptive Uses:

- Urban and peri-urban (numerous cities, towns and growth points in the catchment)
- 18 major dams with storage capacity totalling 2,250 million m³

- numerous commercial irrigation schemes totalling more than 24,000 ha
- many smallholder irrigation schemes totalling perhaps 2,500 ha
- forestry (eucalyptus, gum, pine)

7.2.4 Save Basin: Mozambique

The Save River serves as a boundary between the provinces of Gaza, Inhambane, Sofala and Manica. As with the Pungwe River Basin, there is not much information available regarding resource use in this area. During the war, much of this area was only accessible by air and/or military escort. A large section of the river's south bank borders the 5,000 km² Zinave national park, officially located in Inhambane Province. A significant portion of its north bank, in both Manica and Sofala Provinces is designated game reserve (Moyo and O'Keefe, 1993: 152). In effect this area acted as a buffer zone between the ruling MPLA south and the RENAMO dominated north during the civil war. In general the soils in this area are not conducive to intensive agricultural production. The Save crosses agro-ecological zones 3-5 en route to the sea. According to Moyo et al, there is semi-intensive farming activity south of the Save'; however irregular rainfall including occurrences of drought and flood make farming difficult.

The ecological conditions favour mixed arable and livestock farming. The region is also well suited to the cultivation of tropical fruits relatively resistant to water scarcity ... In terms of food crops, the cultivation of drought-resistant varieties should be considered. More drought-resistant crops such as cotton, sorghum, cassava and sunflower have demonstrated the best adaptation to the hydrological conditions. From the point of view of livestock, some areas are infested with tsetse fly... (Moyo and O'Keefe, 1993: 142).

While not the poorest part of Mozambique, Human Development Index (HDI) values for Manica, Sofala, Inhambane and Gaza provinces are 0.340, 0.305, 0.306 and 0.303 respectively. This may be contrasted with Maputo City's HDI of 0.605 and Mozambique's overall HDI of 0.285 (1998 values). This helps give some indication of the level of poverty in the region and may be contrasted with the active urban, industrial and commercial agricultural use to which the upper Save/Runde River Basin in Zimbabwe is put.

In summary:

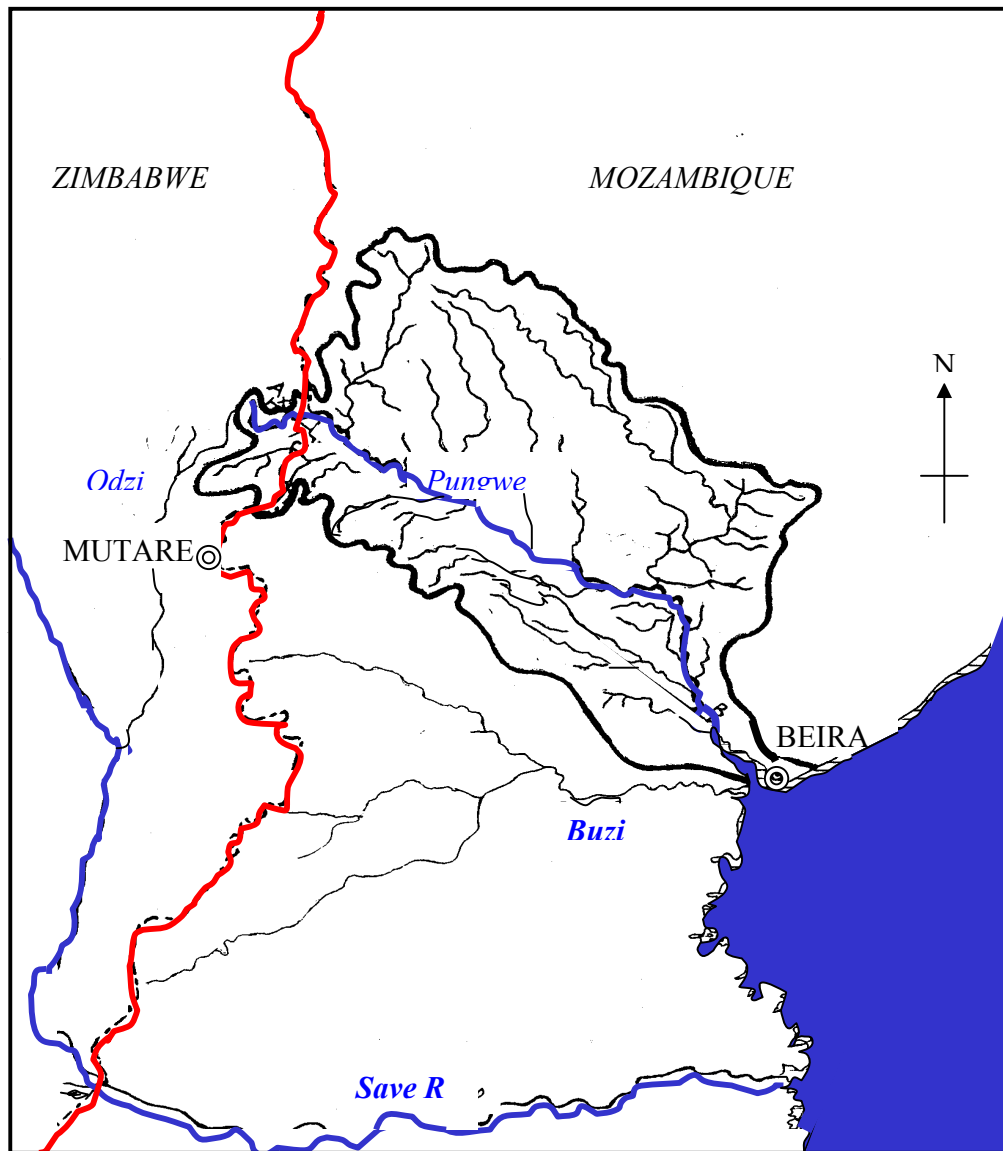
Non-consumptive uses:

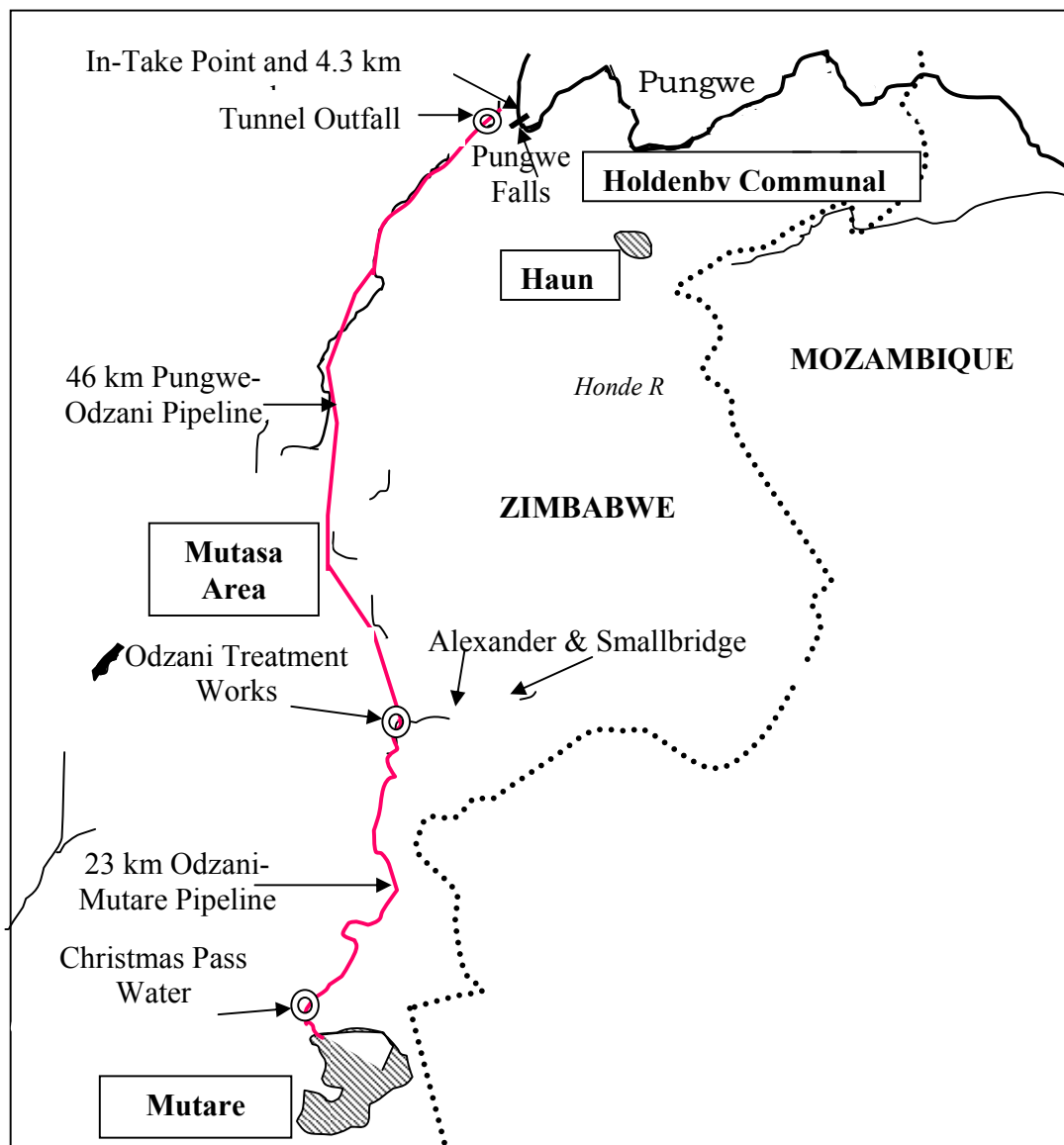
- National park and game reserve

Consumptive uses:

- Limited subsistence and/or commercial farming

Figure 7.2 Pungwe River Basin





CHAPTER 8: TRACK 2 RESULTS:

INSTITUTIONAL REFORMS AND STAKEHOLDER PARTICIPATION IN WATER RESOURCES MANAGEMENT IN ZIMBABWE

Integrated Water Resources Management

Since 1995, Zimbabwe has embarked on a water sector reform process that has culminated in a policy framework that embodies the main tenets of integrated water resources management (IWRM). Central to Zimbabwe's adoption of the IWRM approach are the objectives of redressing past injustices in access to water, resolving conflicts emanating from sharing water, improving efficiency in water use and management, and strengthening environmental protection.

In essence, there has been a shift away from the past water laws' distinction between ground water, surface water and private water towards recognition that groundwater and surface water are part of the same watercourse system. The water sector reforms have included the recognition that the environment, as the primary resource base, requires some water to be reserved for the maintenance of the ecosystem. Our project examined, among other things, how the Save Catchment Council and the Pungwe Sub-Catchment Council have grappled with the challenges of implementing an integrated approach to water resources management and ensuring an adequate environmental reserve of water, as required by Zimbabwe's new water act.

Water as a 'public good'

The new water policy considers that water within the watercourse system is a 'public good' and cannot be privately owned. This is intended to pave the way towards achieving equity in access to water resources and safeguarding the basic water rights of all people in Zimbabwe.

Water as an 'economic good'

The new water policy of Zimbabwe also recognizes that water has an economic value in all its competing uses. However, in pursuing enhanced efficiency in water use and management, the new water policy makes provision that the principle of water as 'an economic good' should not compromise the basic water rights of people. Certain aspects of our project – institutional reform, urban agriculture, access to potable water and sanitation – examined how structural inequalities, e.g. class and gender, have impacted on the stated goals of equity in access to water, water-related decision-making and capacity building among stakeholders at the catchment level. Stakeholder and gender power politics seem to have a plausible bearing on the balance between the pursuit of the efficiency and equity ideals by IWRM institutions.

Gender

Gender formed a primary component of the research. Our focus on gender derived from the observation that despite the fact that women play a pivotal and multi-faceted role in the provision, use and safeguarding of water in Zimbabwe, water policies have generally not adequately reflected the importance of women's role in the water sector (UNESCO, 2000). While Zimbabwe's IWRM Strategy (Government of Zimbabwe, WRMS, 2000) acknowledges, in principle, the need to actively involve women in particular in all levels of water resources management, the new water law (The Water Act of 1998) has not explicitly addressed the issue of gender (Dube and Swatuk, 2002; Tapela, 2002).

Institutional Forms

The design phase of Zimbabwe's new water policy has been followed by legal and institutional reforms, and the adoption of the Integrated Catchment Management (ICM) approach as the operational framework towards achieving IWRM. The next section gives an outline of the unfolding IWRM framework and the ICM approach in Zimbabwe.

In order to facilitate ICM, the country has been partitioned into seven Catchment Areas. The Catchment Area boundary is defined by the whole extent of the river system or group of river systems (Government of Zimbabwe, 2000a). Each Catchment Area falls under the jurisdiction of a Catchment Council (CC). The Catchment Areas are sub-divided into Sub-Catchments whose boundaries are delineated according to "sub-hydrological zones". The Sub-Catchments are administered by Sub-Catchment Councils (SCCs). In some parts of the country, the Sub-Catchments have been further sub-divided into Water User Boards or Associations that are composed of elected members from defined 'micro-catchments'.

Zimbabwe's water sector reforms have resulted in the dispersal of authority to sub-national and supra-national levels, the separation of regulatory and operational functions, and the delegation of operational functions to the lower levels. The decentralization of water resources management has involved the emergence of a hierarchical organizational structure for the governance of water resources within the country (Figure 8.1). Our study focused primarily but not only on the local catchment level institutions for IWRM.

At the local catchment level, the devolution of authority to river basin institutions has been based on the principles of stakeholder participation, equity in access to water resources, efficiency in resource use and management, and sustainability of the ecosystem, livelihoods and administrative structures. It would seem that the organizational structure for catchment management is intended to enhance *efficiency* in water use, development, management, appropriation and provision; *equity* through representative stakeholder participation, involving various interests from the lowest possible level; and the *sustainability* of the ecosystem, livelihoods, economies, and water resources management institutions. 'Stakeholder' participation in water-related decision-making and the devolution of water resources management authority to the local level are seen as ways of reducing the 'transaction costs' of resources management.

The legally recognized stakeholders that constitute the CCs and SCCs include local authorities (Municipalities, Town Councils, Rural District Councils and traditional leadership), Mines, Large and Small Scale Commercial Farmers, Communal Farmers and Resettlement Area Farmers (Government of Zimbabwe, 1998). Two councillors represent stakeholders at the SCC level in the CC. In turn, each CC in Zimbabwe is represented by three councillors in the Zimbabwe National Water Authority (ZINWA) Board of Governors. In effect therefore, the emerging framework of local stakeholder participation in water governance is through representation.

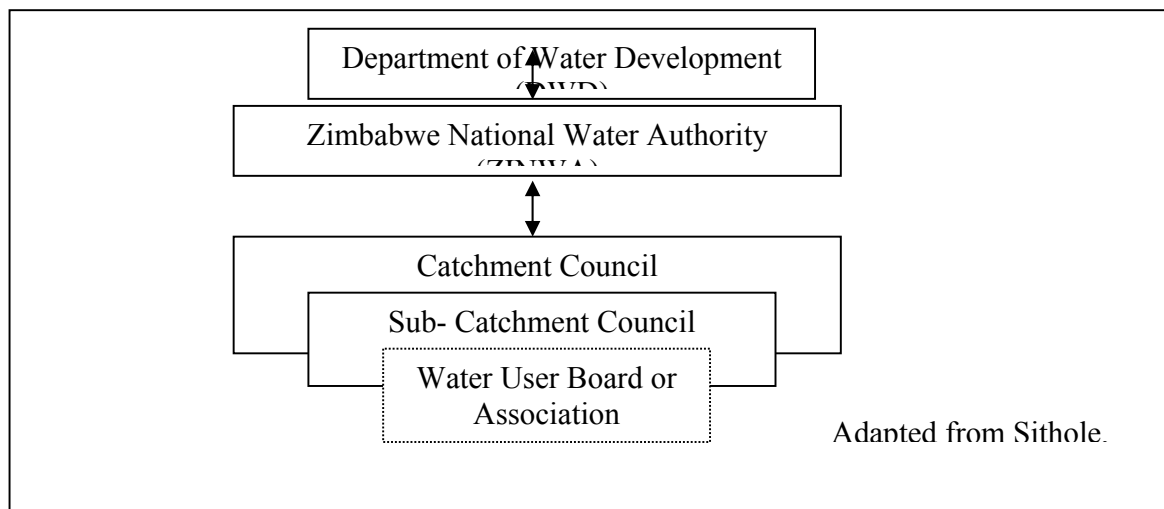


FIGURE 8.1 ZIMBABWE: ORGANIZATIONAL HIERARCHY FOR WATER GOVERNANCE INSTITUTIONS

The responsibilities of the CC include collaborating with the water parastatal, ZINWA (Zimbabwe National Water Authority), in preparing and updating Catchment Outline Plans; deciding on and enforcing all water allocations and reallocations; developing and supervising programs for catchment protection; issuing and overseeing permits for water use; establishing and maintaining, with ZINWA, a data base and information system; and overseeing operations and functions of SCCs (Government of Zimbabwe, 1998). Due to constraints of institutional capacity, the Catchment Manager, an employee of ZINWA, gives technical advice to the CC. The Catchment Manager is also empowered by the law to make water allocation decisions if the CC is in recess, provided there is no specific opposition to the water permit applications.

The responsibilities of SCCs are to monitor the exercise of permits, water flows and use; to assist in pollution control, catchment protection and data gathering; and to collect from permit holders the levies to be used in the performance of the councils' functions (Government of Zimbabwe, 1998).

In the case of the Pungwe River Basin, a number of institutional arrangements have been put in place to perform the operational functions of IWRM. At the local level, in the

portion of the watercourse within Zimbabwe, the Pungwe Sub-Catchment Council was established in 1999 as a constituent of the neighbouring Save Catchment Council. A Catchment Manager, who is employed by ZINWA, assists these councils with the issuing of water permits and with other technical aspects of water management. At the bilateral level, ZINWA has been involved in the Joint Water Commission Concerning Water Resources of Common Interest between Mozambique and Zimbabwe. The Pungwe Sub-Catchment Council, however, has expressed an intention to be more directly involved in the governance of the Pungwe watercourse at the inter-state level. The Pungwe Sub-Catchment Council is potentially therefore a key player in the higher level discourses over the sharing of Pungwe water.

In general, Zimbabwe's water sector reforms would seem to have provided the policy environment required for resolving water-related conflicts and ensuring broader security. The Catchment Councils and Sub-Catchment Councils seem to have effectively become centrally placed to deal with the unfolding challenges of implementing IWRM policy and achieving the envisaged outcomes at the local catchment level. However, various studies of the pilot phase of policy design and implementation (Nhidza, 2001; Derman & Ferguson, 2000; Latham, 2000; Ndamba, 2000; Sithole, 2000) have noted some of the difficulties faced by the catchment level institutions in translating political will into effective and coordinated practice.

Our study examined the unfolding post-pilot phase implementation of IWRM policy by two of the institutions surrounding Zimbabwe's Pungwe-Mutare Water Supply Project. Focus was on the Pungwe Sub-Catchment Council, at the lower level, and the Save Catchment Council, at the higher level of the hierarchy for the management of the Pungwe watercourse.

Nature of the Water Availability Problem

Within Zimbabwe, water scarcity appears to affect areas adjacent to the Pungwe Basin more than areas within the basin (Figure 5.3). The Nyanga communal and resettlement areas to the north of the Pungwe Basin have particularly high surface water deficits (Katerere, 1997; Mazambani, 1997). The City of Mutare in the adjacent Odzi Sub-Catchment Area of the Save River Basin has envisaged possible water shortages due to urban population growth and an increase in industrial water demand. People living in the Mutasa Communal Lands, also located in the Odzi Sub-Catchment Area, have expressed interest in securing access to the Pungwe water for irrigation purposes. There is possible increased demand for Pungwe water from stakeholders within the portion of the Pungwe River Basin in Zimbabwe. These stakeholders include the Hauna Growth Point and the Small-Scale Commercial Farming sector in the Honde Valley.

In Mozambique, the water scarcity problem affects Beira City during the dry season, while the problem of flooding almost exclusively affects the lower reaches of the Pungwe floodplain during periods of high rainfall (Nilsson and Shela, 1998). Water shortages in Beira are due to the saltwater intrusion that occurs within the 80km long stretch of the river, where the intake pipe that supplies the city is located. Water shortage is also due to

the inadequacy of the city's water supply infrastructure to cater for the potable water needs of the population. Excess water in the lower Pungwe on occasion presents as much of a problem as does water scarcity in Beira City. Although the potential of the Pungwe to inundate extensive areas within the floodplain is recognized, there are as yet inadequate disaster mitigation strategies. Consequently, the security of human lives, livelihoods, property and commercial developments, such as the estuarine prawn fisheries, the Mafambisse Sugar Estate and the proposed Industrial Free Zone north of Beira, continue to be threatened.

Given that the upper portion of the Pungwe River basin has high flow volumes throughout the year, the sharing of Pungwe water would seem not to constitute a major problem. However, there are sub-national and interstate problems of sharing Pungwe water owing to the existence of both water scarcity and excess in areas within and adjacent to the basin.

At the sub-national level in Zimbabwe, the issue of access to water is closely linked to the issue of access to land, as both constitute the resource base for production and livelihood generation. The historical allocations of water and land have tended to favour certain minority groups, at the expense of the larger less affluent rural population. Thus, the devolution of water management authority and the redistribution of water resources have taken place simultaneous to the Zimbabwe government's fast-track land resettlement programme. The politics of sharing water and land resources in Zimbabwe and the geographical characteristics of the inter-basin project both point to the existence of a complex water governance situation that requires appropriate institutions to resolve potential conflicts and foster cooperation over the sharing of Pungwe water among the various stakeholders.

Stakeholder Participation

Stakeholder participation is claimed to be key to the equity, efficiency and sustainability of Zimbabwe's reforms. According to the WRMS document *Towards Integrated Water Resources Management* (Government of Zimbabwe, 2000: 111), stakeholders are 'persons, groups or institutions with interest in a project or programme who may be affected in positive or negative manner by the decisions and actions made. This definition includes both winners and losers and those involved in or excluded from decision making'. A few paragraphs later it is suggested that 'opportunities for the participation of the marginalised groups are created and safeguarded' through the formation of CCs and SCCs (ibid.). Women are singled out for special mention: 'A failure to provide adequate opportunities for the equal participation of women in the management of water will compromise the long-term objective of the development and efficient utilisation of the resource' (ibid.: 112). Along with enhanced involvement of the 'stakeholder' is the expressed desire to see water managed at 'the lowest appropriate level' (ibid.: 10).

In our case study of stakeholder participation we presented some initial observations regarding the ways in which participation and stakeholder involvement are being built into the water reform process. Our argument is that the drive to involve 'stakeholders' at

the ‘lowest appropriate level’ should not be assumed to be simply a technical exercise in institution building. As Dovers points out, ‘Institutions are defined more by the past than the present – they change slowly for the most part, and are more often suited to yesterday’s understanding and imperatives rather than those of today, let alone those of tomorrow’ (2001: 215). In Zimbabwe, the implementation of water reforms shows, at this early stage, a strong tendency toward top-down decision-making, and the dominance of the new institutions by those already empowered within society.

Participation and Theory

Participation in natural resources management is now *de rigueur* in donor and recipient state policies (Jeffery and Vira, 2001). As to the roots of this perspective, Dovers’ claims, ‘there has been increasing interest over recent decades in political and critical theory in more inclusive, participatory ways of “doing” policy and politics, often expressed in opposition to the countervailing trends of marketisation and globalisation’ (2001: 222). However, ideas regarding ‘participation’ also grow out of these trends – that less state intervention means freeing up civil society to participate openly in the market. This perspective is most clearly elaborated in Putnam’s well-known treatise on social capital (Putnam, 1993). Ideas regarding the building of ‘social capital’ are at the heart of neo-liberal discourses of development. However, liberal language depoliticises the reform process: ‘trust’ will build ‘social capital’ which are ‘networks of cooperation’. Under close examination, it may be seen that in developing countries, donor states, companies, and individuals are the actors most likely to benefit directly from ‘liberalising’ structural reforms (Saul, 2001). Recipient states and regimes struggle mightily to retain influence and control. While liberal theorists argue that ‘citizens’ are more likely to participate when they ‘see direct benefits’, it is more likely that they will get involved when they ‘see some aspect of their “way-of-life” threatened’ (Oliver, 2001: 266).

In present day Zimbabwe, there is very little trust indeed. So, institutional reform built around an uninterrogated language of ‘trust’ may do more harm than good. If people are really interested in equal access to water resources – as many are – they must recognise the multiple agenda surrounding ‘reform’ and acknowledge that positive change, as always, emerges out of struggle.

Participation and practice

In Zimbabwe, the impetus for participatory, stakeholder-‘driven’ water reforms emanated not from the poor and marginalised but from the top, i.e. from the national government, international donors and financial institutions (Government of Zimbabwe, 2000: 7-10; GTZ, 2000: 11). Motives, of course, varied greatly. One should not be deluded into believing that altruism is at the root of this project, inclusivist language notwithstanding. Evidence from participatory natural resources management PNRM projects illustrates how the language of cooperation, participation and devolution often masks intended outcomes of renewed state and/or vested interest power (Twyman, 1999; Jeffery and

Vira, 2001). Thus, 'participation' may at best be passive, where people participate by being told what is going to happen or has already happened.¹

Mazowe Pilot Project Experience

In Zimbabwe, the process of reforming the water sector emanated from the central Government in consultation with donor states. It therefore began with consultations at the highest levels of government, later devolving to a group of technical experts who comprised the WRMS secretariat. This group was then tasked with developing a management strategy. It was there that 'subsidiarity' – i.e. that resources should be managed at the lowest appropriate level – was decided upon. The Sanyati and Mazowe Catchment areas served as loci for pilot projects. Their perceived 'success' encouraged government and donors to fast-track the other five catchment councils. The other five Catchment Councils (Gwayi, Manyame, Mzingwane, Runde, Save) were given a mere six weeks to get themselves established (Latham, pers. comm. 28/06/01).

What kind of 'success' was achieved in the pilot projects? Interesting evidence may be drawn from two different accounts of the Mazowe Catchment Council (MCC). On the one hand, the Deutsche Gesellschaft für Technische Zusammenarbeit (GTZ) report on the history and lessons learned from the formation of the MCC (GTZ, 2000) provides a relatively balanced view of the exercise. It might be termed 'cautiously optimistic'. On the other hand, Sithole (2000) is far more critical. Both reports use 'stakeholder participation' and 'equitable access' as benchmarks for assessing the 'Mazowe experience'.

In its Executive Summary (2000: 8), the GTZ document highlights 'important lessons learned'. For example, (i) complete honesty in an atmosphere free of politics... helps people to be more sensitive to the needs of other participants; (ii) low levels of public awareness impact negatively on stakeholder participation; and (iii) if the perceived objective of 'development' seems unlikely to be achieved, cooperation and participation from the communal sector diminishes or disappears.

Notably, aside from claims that 'the resultant working atmosphere was very constructive' and that 'black small-scale communal farmers and the white commercial farmers have formed harmonious working relationships' – no small achievements – there is little evidence in the document to suggest that 'success' at the pilot level warranted fast-tracking the other schemes. To illustrate the gap between donor perceptions of inclusive 'participation' and its actual practice, we give but one example. A large workshop was held on 3 July 1996 in Bindura 'to *inform* a wide cross-section of stakeholders about the proposed changes in the water sector and to *gain support* for the Mazowe Pilot Project' (GTZ, 2000: 11, our emphasis). 74 people participated with 36 from government, 18 from the private sector, 2 NGOs, 6 chiefs, 1 chief's aid, an independent farmer (1 of 4 women at the meeting), 5 from various user groups (commercial farmers union, irrigation

¹ This is the simplest and least active means of participation on Pretty's scale which includes (1) passive participation; (2) participation in information giving; (3) participation by consultation; (4) participation for material incentives; (5) functional participation; (6) interactive participation; and (7) self-mobilisation (in Jeffery and Vira, 2001: 3).

board), 1 teacher, 1 journalist and 3 from GTZ, the donor. While an improvement on what might normally have ensued, 'representation' in this case resembles an inverted pyramid. How then are we to interpret lessons learned ii and iii above? How might those six chiefs and that one woman farmer have felt among so many government officials and technical experts in Bindura?

Sithole provides some insight. She quotes one local person: 'To laugh at a running person, you must have seen them running'. In the context of catchment council formation in particular and water reforms in general, the essence of this is 'How can we assess proposed reforms if we have not been part of the planning process? For Sithole, '[I]n a situation which, historically, development of water has favored one group against another, one wonders what kind of cooperative behaviour can evolve among the actors' (2000: 6). To take her observation further, the Mazowe Catchment was chosen as a pilot project in part because it 'had a history of *decentralised* catchment-based management and had already formed a *private-sector-driven* "Mazowe River Catchment Development Company" when the Water Sector Reform began' (GTZ, 2000: 11; our emphasis). This company comprised 'an existing fully-functional rightsholder-based water management system for surface water with seven River Boards operating under the umbrella of a Catchment River Board' (ibid). In other words, the interests and management experience of white commercial farmers were to provide the framework for the pilot project.

This is how smallholders themselves understood the 'reform' process. At Nyadiri Sub-Catchment consultative meeting (13/10/99), Sithole reports that 'the "so-called" involvement in the water reform process came as a surprise to chiefs' and that 'Most chiefs expressed the sentiment that they did not understand why they were invited' (p. 10). One RDC official stated at Nyagui Catchment Council meeting (06/10/99), 'the new and proposed system changes nothing, those with money to build dams still have a comparative advantage over those in communal areas who have no hope in hell of ever building and sustaining one' (p. 9). In our experience with the Save CC, it is clear that CFU and indigenous commercial farmers union (ICFU) members have taken subsidiarity seriously. As with the Mazowe experience, black and white commercial farmers have formed a relatively stable alliance in defense of their common interests: access to water permits. From this perspective, the CC resembles a special interest group.

In her analysis of the dynamics of various 'stakeholder' meetings, Sithole observes, 'the relationship between different categories of stakeholders has been one of domination and acquiescence. Political history and the institutional framework has in the past and continues in the present to perpetuate these dominance/subordinate relationships between groups and sectors. Consequently, to understand the nature of participation by particular groups, one must appreciate the cause of centralism that preceded it' (p. 15). According to Sithole, it is as if the 'mere presence by a particular stakeholder group was all it takes to have the so-called "consensus" decisions on management' (p. 15).

Donors keen to observe 'participation', then, found it at the Mazowe consultative meeting. Indeed, one key informant who was a central player at that meeting, said to us that while 'whites have experience in managing water' so tending to dominate,

stakeholder consultations over the course of the WRMS process were ‘unbiased, focussed, and facts-oriented’. In the rural areas, he said, ‘debate is better than in parliament’. In his informed opinion, the pilot catchment experience ‘percolated right to the ground’ (Murungweni, pers. comm.). However, it is useful to keep the image of the inverted pyramid in mind.

The Save River Catchment

The Save River Catchment Council (CC) and Sub-Catchment Councils (SCCs) held inaugural meetings in July 1999. After one year they were still in very rudimentary form (Murinye, pers. comm.). Four years down the line, they are now virtually moribund, meeting no more than three or four times a year, having been overtaken by current political unrest in the country. Nevertheless, it remains important to think about what was and what might still be achieved (Manzungu, 2003; Swatuk, 2003b).

As of June 2002, beyond issuing water permits, it remains somewhat unclear what the CC and SCCs are to do, how they are to do it, how they are to finance their activities, and what is their relationship to the Catchment Manager and to the apex organization, the Zimbabwe National Water Authority (ZINWA). In the words of one key informant, “the formation of catchment councils was just dumped on us” (interview, July 2000). In this situation, Provincial Water Engineer (PWE) Murinye was forced to use all of his staff toward operationalising the Save CC. Subsequently, he became the Catchment Manager whose role it is to liaise with the CC and SCCs and to provide them with technical advice. Officially, he is an employee of the Department of Water Development (DWD), seconded by ZINWA.

Constitution and Objectives of the CC

Like Zimbabwe’s other CCs, the Save CC is comprised of the Chair and Vice-Chair Persons (all men, actually) of the 7 SCCs. At the inaugural meeting of the SRCC (16/07/99) it was decided to co-opt Mutare City Council ‘to bring Council membership to fifteen. This was in view of the fact that the City is a major consumer who can not be ignored’ (minutes SCC1: 1-2). At that initial meeting, the Chairman, Provincial Administrator, D.C. Munyoro, ‘went on to emphasise the importance of the task that lay ahead for the councillors in mind that Water management was a broad responsibility involving land, water and the people’. Munyoro went on to identify the SRCC’s major challenges as the utilisation of ‘water to eradicate poverty among the people of the area’ and to ‘protect and preserve’ the Save River (ibid). Also at that initial meeting, Mr. D. Kagoro, DWD and National Coordinator, ZINWA, highlighted the overall objectives of the reform process: ‘i) equitable access to water by all Zimbabweans; ii) efficiency in the exploitation and utilisation of water; iii) strengthening of environmental protection in the exploitation and management of water resources; iv) improvement in the administration of the Water Act’ (SCC1: 2).

Representation

Members are 'stakeholders' drawn from the main user groups: Commercial Farmers (CFU, Farmers Associations); Communal Farmers (Zimbabwe Farmers Union); Indigenous Commercial Farmers Union (ICFU); Resettlement Farmers; Small Scale Irrigators; Industry; Mining; Urban Councils; Rural District Councils. According to the Catchment Manager, these 'stakeholder' groups were identified by the provincial water ministry. Conspicuous in their absence from this list are groups who use water but do not consume it – national parks and tourism operators. However, CCs and SCCs are not closed forums; they remain open to representations from other groups and are themselves in a gestative condition. The trend has been for this list to be amended as each CC or SCC has seen fit (Murinye, pers. comm.).

While CCs and SCCs appear more or less 'inclusive' one cannot underestimate the impact of certain *eminence grises* in the constitution and operation of these 'new' organisations. Two in particular bear mentioning: First, as Tillman *et al* point out, 'It is no simple matter to change existing habits or planning/management schemes that have evolved over many years' (2001: 320). The impact of the past on the present is clear in the Mazowe example above: vested interests, questions of race/class, privileging technical knowledge over 'traditional' ways of knowing – all of these things lie at the very heart of the 'new water hierarchy' in Zimbabwe. Second, and emerging out of the first point, present at every meeting are the power dynamics of a deeply divided society. Indeed, by having pre-determined the structure and scope of 'reforms', it clear that the interests of Central Government are best represented.

Finance

One of the primary aims of the reform process is to make water management self-financing. Commercial users are to pay for the raw water they use or store, and a levy for the general management of the water sector. Levies are to be collected by the CC 'on behalf of ZINWA' at the rate of Z\$40/Ml per quarter for directly abstracted water and Z\$19.70 per quarter for stored water (based on coefficient of variation and yield). Out of this pool of money, the CC/SCCs get back 7.5% to be used to 'manage' the (sub)catchment. ZINWA remains the provider of bulk raw water. At present, the tariff for raw water for commercial use is Z\$270/Ml. Murungweni, for one, feels that water remains seriously underpriced (pers. comm.). Levies are to be paid by all water permit holders. This includes ZINWA where the Authority owns and operates a dam.

For Nhidza (2001: 13), a fundamental problem with this set-up is the failure of the reforms to include local authorities' water utilities. 'Financial arrangements of local authorities are such that revenue collected from water bills is bundled together, in the same "basket" with revenue collected from rates for other services which have nothing or very little to do with water services'. This is tantamount to 'financial indiscipline' as revenue from water is used not to maintain or improve water delivery, but to subsidise all other activities. Thus, in terms of our case, the City of Mutare pays raw water costs to ZINWA for water it gets from the Pungwe River supply scheme. These costs are passed

on to consumers and a sizeable profit is made. This profit is then used to subsidise all other Council activities. Without this steady supply of Pungwe River water, the activities of the Mutare City Council would grind to a halt. Indeed, in a telling interview with a key informant at City Council, it was revealed to us that City Council is having difficulty in encouraging residents to dispense with their water *saving* ways – habits developed over the drought years – and consume more water. Said the informant, ‘We have water to sell!’ (pers. comm.).

Awareness and Outreach

One of the stated major goals of the water reforms is to involve people at the lowest appropriate levels in the management of the resource. While CCs and SCCs are the major forums for this activity, it is also envisioned that other, lower tiers will be involved and/or created, e.g. water user boards. If the water sector hopes to achieve its stated goals of equity of access, and effective, efficient and sustainable management, it is imperative that all users understand the ‘system’. To this end, each CC and SCC is to have a ‘training officer’ whose task it is, in the words of the Save River Catchment Manager, ‘to capture the wishes of all people and collate their wishes into a work plan’. Given that Agritex has the ‘best network in the country’, it was logical that the SRCC chose to employ someone who is both ex-Agritex and has worked with and understands the needs and problems faced by the ZFU. In Murinye’s words, ‘the commercial farmers union knows how to look after its own interests’ (pers. comm.).

The training officer, Mr. Joel Sithole, is a dynamic personality, clearly suited to the job. Both in discussion with him, and in reading his reports, it is clear that the task of imparting information and raising awareness over an entire catchment area is daunting. It is made more difficult by a lack of time, and human and financial resource limitations. SIDA-provided seed money, initially due to end in December 2001, was rolled-over into 2002 but has since been suspended in the wake of the land issue. Sithole, like the CM, is overworked and overstretched. It is not uncommon for the CC to simply off-load tasks to him. On the down side, the training officer’s brief has enlarged to such an extent that very little ‘training’ is being done. On the positive side, however, in covering so much ground, the training officer knows the catchment and its concerns better than anyone. In other words, he is the ‘thread’ in the patchwork quilt of water reform in rural areas.

At outreach/awareness meetings, no matter the composition of the meeting, gender representation or venue, the same concerns are raised:

- knowledge, i.e. an almost uniform ignorance of the water reforms that have taken place and worry over the implications of such reform;
- money, e.g. concerns over levies, permit application fees and the like;
- maintenance issues, e.g. borehole, dam and equipment repairs and their associated costs;
- plow back and other direct benefits from payment of fees;
- an almost uniform desire for individual ownership if user-pay is to guide water project developments;

- a long wish list of possible irrigation projects;
- a near universal demand for more systematic and sustained assistance from government, at whatever level.

The Pungwe Sub-Catchment Council

The geographical characteristics of the interbasin project point to the existence of a complex water governance situation that requires appropriate institutions to resolve potential conflicts and foster cooperation over the sharing of Pungwe water among the various stakeholders. Towards this end, a number of institutional arrangements have been put in place.

At the bi-lateral level, the Joint Water Commission Concerning Water Resources of Common Interest has recently been established between Mozambique and Zimbabwe (Government of Zimbabwe, 2000b). The Joint Commission represents the only formal watercourse-wide management institution to emerge in the Pungwe Watercourse. To date, the Joint Commission has facilitated the agreement between Mozambique and Zimbabwe over the Pungwe-Mutare Water Supply Project.

At the local level in Zimbabwe, the Pungwe Sub-Catchment Council was established in 1999 as a constituent of the neighbouring Save Catchment Council. Although at the time of the study the Pungwe Sub-Catchment Council was not yet fully operational, effort had been made towards representation of the various water user sectors in the Zimbabwean portion of the watercourse. The Pungwe Sub-Catchment Council was represented in the Joint Commission by the Save Catchment Council representatives elected into the ZINWA Board.

In the Mozambican portion of the Pungwe Watercourse, ARA-Centro, a regional agency of the Department of Water Affairs (DNA), was established in 1998 as the responsible watercourse management authority (Carmo Vaz & Lopez-Pereira, 1998). ARA-Centro seems to be in the initial stages of operation.

The agreement between Mozambique and Zimbabwe has permitted Mutare City to use the water abstracted from the Pungwe for primary purposes only. Given the problems of water scarcity and excess, and the possible increases in primary, industrial and agricultural demands within upstream Zimbabwe and downstream Mozambique, cooperation in the sharing of Pungwe water indeed requires effective institutional mechanisms for dealing with the potential sub-state and interstate conflicts. The recent shifts at the local and bi-lateral levels towards the ICM are probably timely. An important question, however, is whether the newly emerged institutional arrangements are resilient, robust, efficient, and embedded enough to ensure the equitable, efficient and sustainable implementation of IWRM in the context of developments such as the Pungwe-Mutare Water Supply Project.

Representation in the Pungwe SCC was dominated by stakeholder interests in water for productive purposes, mostly in the agricultural sector. The stakeholders represented

largely included large-scale commercial farmers, small-scale commercial farmers and communal area farmers. Within the Pungwe SCC, the farmers were represented according to membership of particular crop growers' associations, such as Coffee and Banana Growers' Associations, or farmers' unions, such as Zimbabwe Farmers' Union (ZFU) and Commercial Farmers' Union (CFU). This resulted in the farmers occupying eight of the ten seats in the SCC.

There was no representation of the forestry and tourism sectors and the tea estates, despite the fact that these are major stakeholder producers within the area. There was no evident representation of resettlement area farmers despite the fact that this is a rapidly growing sector due to the government's fast track land redistribution programme. The mining sector was not represented either, owing to its relatively low significance within the area. Local authorities represented primary water users. Attendance of council meetings by some local authorities tended to be erratic or relatively low, however.

Representation in the councils was also dominated by male councilors. The Save CC had no female councillor. By contrast, the Pungwe SCC had made effort to involve women in

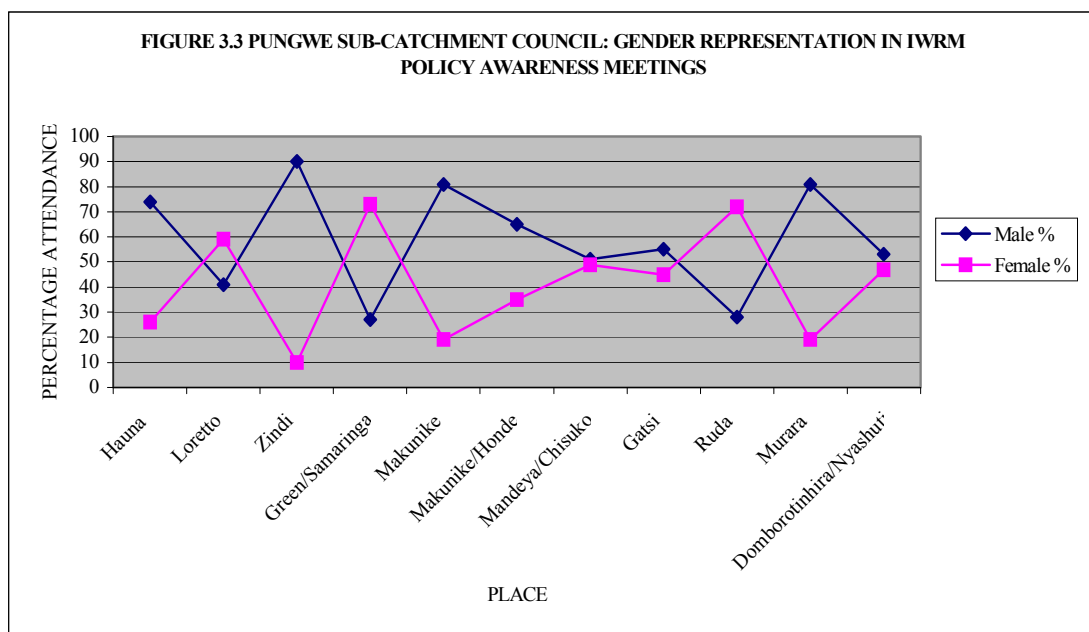


FIGURE 8.2: GENDER REPRESENTATION IN POLICY AWARENESS MEETINGS

decision-making, and two of the ten SCC seats had been reserved for women farmers. The representation of women in the IWRM policy awareness meetings also tended to be lower than that of men (Figure 8.2). Eight of the eleven awareness meetings held between August 2000 and June 2001 had greater male representation, and men constituted 55% of the total attendance of the awareness meetings.

Gender representation in meetings tended to vary from place to place. A follow up to this observation showed that these variations were related to differences in gender roles and

time use in the various locations and under varying circumstances within the area. In some areas, particularly where the resident male population was relatively high, many men felt that they had to retain their traditional leadership role even in new initiatives such as the IWRM policy awareness meetings. In other areas the demands on women's time by reproductive work compelled women to avoid attending awareness meetings, thus leaving mostly the men available to attend meetings. In yet other areas, the lack of employment opportunities compelled men to migrate elsewhere to seek better opportunities, leaving women the responsibility to attend the meetings.

Catchment and Sub-Catchment Council Performance

Researchers attended either together or separately, several CC and SCC meetings. Based on a combination of personal observation, open-ended discussions with members of these councils, and a close reading of the minutes of the SRCC and Odzi and Pungwe SCCs, we note several trends regarding participation. The most obvious point to be made concerns the dominance of the SRCC by the Chairperson – himself the Eastern Region CFU representative – and by white commercial farmers in general. It would be unfair to read anything into these management/participation styles beyond the strength, confidence and demonstrated self-interest of the persons themselves. Nevertheless, it is clear that this style of behaviour either shuts-out or intimidates non-white members of the SRCC. This point was made to us in conversation with several of these individuals. It was also clear in comparison with the more open and open-ended style of meeting held by the PSCC, where stakeholders are more fully represented, and at the OSCC meeting where the Chairperson was absent.² One should not underestimate the importance of these considerations especially where people with fundamentally different cultural backgrounds are brought together.

The SRCC and its SCCs have taken great pains to achieve racial balance at the top. So, of the 16 Chairs and Vice-Chairs, 8 are white and 8 are black. Gender representation, however, is heavily skewed toward males. The fact that CCs and SCCs are at an early stage of development is reflected in the issues discussed at meetings. Meetings are overwhelmingly concerned with organisational and budgetary matters, for example:

- opening bank accounts
- determining travel allowances
- renting out office space
- hiring training officers
- acquiring vehicles (in this case motorbikes for SCC training officers)
- revising budgets
- accurately accounting for expenditures
- clarifying matters regarding levies and application fees for water permits.

There was an openly expressed desire to not let the donors down and to 'get your houses in order'. Stated the CC Chair: 'My biggest problem is Z\$ 1.2 million we need to account

² The Chairperson of the OSCC is also the Chairperson of the SRCC.

for' (pers. comm.). In the absence of SIDA funding, the Catchment Manager feels that 'we are not yet sturdy on our own' (pers. comm.). At this point, there is virtually no discussion of larger goals like 'eradicating poverty' highlighted by Munyoro above.

With regard to issuing water permits, a core task of the CC and the stated 'barometer' of both stakeholder participation and management at 'lowest appropriate' level, the requests for permits that were granted at the CC meeting we attended had been previously submitted to, vetted and approved by ZINWA.

Non-participation as 'participation'?

If Mutare City Council does not attend a CC meeting but Chief X does, can we say with confidence that community X, represented through the Chief, is participating while Mutare City Council is not? Similarly, if a mining company or a tea estate does not attend a SCC meeting, but a smallholder farmer on behalf of his cohort does attend, can we say with confidence that smallholders are more assured of continued access to water than are mining companies or tea estates? These are important questions. The new water architecture not does address abiding power relations in Zimbabwe: mines and tea estates, as generators of foreign capital, have influence and therefore will have water. Claims to the contrary notwithstanding, communal farmers will continue to have more erratic access to this resource.

What was clear from the start, and what remains clear despite current political instability, is the strategic alliance that has formed between large scale and small scale commercial farmers, irrespective of race. (Unlike other parts of the country, many of Manicaland's white commercial farmers remain on the land.) The GTZ report on the Mazowe experience mistakes this cooperation as 'beyond politics'. It is, in our estimation, profoundly political. Threatened by the 'resettlement' process, commercial farmers have chosen to work together. The political nature of this cooperation is further demonstrated in the very vocal frustrations expressed by CC and Pungwe and Odzi SCCs at the infrequent or non-existent attendance of Mutare City Council at meetings. Indeed, Pungwe SCC is a more infrequent attendee at CC meetings, yet they are never chastised.

City Council does not regard its absence as a problem: 'We will attend when we have a problem', said the city engineer in a interview. This seems perfectly reasonable, given the general content of CC and SCC meetings at the moment: dam maintenance and establishing telephone lines and post office boxes are issues fairly remote from the many pressing concerns of Mutare City Council. At the same time, Mutare's water supply is guaranteed via the Pungwe pipeline. For this they pay ZINWA. As long as fresh water supply is assured and CC and SCC meetings concentrate on organisational and/or fundamentally rural matters, the City Council will remain on the sidelines.

There are many other reasons why Mutare City Council should attend these meetings: the way they use water to subsidise other activities; the fact that the City cannot account for more than 50% of delivered water; the pollution that occurs from industrial, urban and peri-urban waste. If the CC is to manage its resources sustainably, these issues must be

dealt with. Until they get beyond problems of organisation, they will have neither means nor reason to compel Mutare City Council to attend. It would not be incorrect to suggest, then, that Mutare's water security – short term though it is – seems to compromise water security at the wider basin level.

Gender aspects and issues

According to Ms Manyau, the only female Odzi sub-catchment council member, gender imbalances must be taken seriously as women continue to be sidelined even though they do most of the water related work (OSCC1). According to Murungweni, there are few women participating in formalised water management structures. For example, the SRCC has no female representative; the Odzi SCC has one. Both have female secretaries whose presence serves to reinforce traditional gender roles rather than challenge them.

Various 'cultural' reasons have been put forward to explain the absence of women in formal structure decision-making roles. Murungweni suggested that women tend to prefer having men occupy visible leadership roles. Murinye suggested that female participation is circumscribed by inconveniences of travel. Sithole stated that the timing of meetings tends to overlap with household duties. In his view, women cannot compromise their household duties for council meetings.

Women's public participation is clearly more prevalent at awareness/outreach meetings which, in a sense, brings 'government', via the training officer, to the people. At these meetings women often outnumbered men, sometimes by as much as 4:1. Irrespective of gender balance, the same issues and concerns appeared again and again. These are the same issues as those expressed at SCC and CC meetings: money, maintenance, a wish-list, a request (communal areas) or outright demand (resettlement areas) for government help. Are these the interests of women? Of women on behalf of communities? Are they the interests of men who determine the agenda and direction of meetings? Are they an expression of the interests of the training officer? Are they a community-derived list of grievances and worries trotted out whenever government pitches up? Given how these issues arise again and again whether women are present, a minority, a secretary, a large majority, or an angry group of demonstrators, begs the research question: are women adequately represented in the new water hierarchy in spite of their absence at formal, senior levels? Moreover, does 'representation' equal empowerment?

Gaining and Maintaining Authority

At an intellectual level, it seems obvious that for water resources to be managed sustainably the institutional framework should match the nature of the resource itself: so, river catchment equals catchment council. However, CCs overlap with many political and sectoral jurisdictions. Manyame catchment, for example, comprises 3 provinces and 7 districts. Add to this a dense web of Department of Natural Resources, Agritex, NGOs, mines, urban councils and others active over the entire region. Coordination and inter-sectoral competition are major problems. None of these groups will submit to the will of

the CC, especially one seen to be dominated by the special interests of commercial farmers.

Further complicating matters, while the ZINWA-CC-SCCs-WUBs hierarchy is designed to sustainably manage *all* water resources, the focus of the CC and the SCCs is overwhelmingly on the commercial use of *surface* water. Presently, groundwater use is being dealt with by the Ministry of Local Government whose task it is to provide primary-use water to rural communities. In theory, there is synergy between the two groups. For example, Mr. Mpingo, Provincial Administrator in the Ministry of Local Government, coordinates the Integrated Rural Water and Sanitation Supply Programme (IRWSSP), and is the local authority 'stakeholder' on the SRCC. According to ZINWA's Mr. Nyabodza (pers. comm.), there is coordination between CC/SCCs and the Local Government-driven IRWSSP. However, it seems to us that this coordination exists only at the top. Important questions remain: at what point does primary use of groundwater become 'commercial'? If a village of 100 subsistence farmers, each farming one hectare of land, use borehole water for irrigation, should they not pay for that water? Again, in theory they will. Getting from theory to practice remains contentious. To draw once again on the Mazowe experience, according to chiefs at the Nyadiri SCC meeting (13/10/99): 'As far as water is concerned most people follow the ways of their forefathers and are not aware that this or that use is illegal' (Sithole, 2000: 10).

Observations and Assessments

The major findings of this case study were that, while there persisted some problems associated with the traditional water management approach, there had also emerged new challenges to IWRM policy implementation by the river basin institutions. Some of the challenges facing the Save CC and the Pungwe SCC seemed to be rooted in the period before their formation, during the pilot phase of policy design and implementation.

Observation 1: Accelerated Catchment Council formation

Studies by Latham (2001), GTZ (2000) and Sithole (2000) indicate that there was a lack of effective stakeholder participation in policy formulation in the pilot phase. Policy discourses effectively remained top-down (Sithole, 2000), and the stakeholder identification process did not involve public participation (Latham, 2001). The insights derived from the Mazoe and the Manyame Catchment pilot projects were to be extrapolated to the remaining five catchment areas in the country (Government of Zimbabwe, 2000). Donor agencies were reported to have been particularly keen for the Save CC and its constituent SCCs to adopt the pilot Catchment Council models, as a way of saving costs.

Stakeholders within the Save Catchment Area appear to have been critical of the approach used in the formation of the pilot CCs. However, certain developments at the national political and macro-economic levels that coincided with the inception of the councils seem to have compelled them to adopt an even less participatory approach. In particular, the initiation of the government's "fast track" land redistribution programme

seems to have exerted ripple effects on the water sector and put political pressure on stakeholders to fast track the water redistribution process. At the same time, the insistence by the IMF on the government to cut spending on public service also seems to have accelerated the process of devolution of authority to the river basin institutions.

The result of reducing the scheduled six month inception period for the CC and SCCs to a mere six week was that the process of council formation was top-down. The fast tracking of the formation of river basin institutions seems to have created a number of difficulties, most of which related to the transaction costs of the reforms. Notwithstanding the acceleration of the devolution process, these transaction costs were also directly related to the persistence of the sectoral approach in water resources management in Zimbabwe.

Observation 2: Transaction Costs

The transaction costs included coordination and communication, both within the water governance hierarchy and in terms of related sectors, as well as enforcement of the new water laws. The acceleration of the devolution process resulted in the river basin institutions assuming responsibilities before they had the necessary capacity to implement ICM. The Save CC and the SCCs had yet to acquire office premises, communication links and personnel for monitoring and enforcement. These setbacks seemed to have been effectively addressed through funding from SIDA as well as the ingenuity of the councillors. The more difficult challenge, however, related to the coordination of ICM planning.

The study found that there had been lack of effective coordination and consultation in the drafting of the Preliminary Catchment Outline Plan. The problem seems to have emanated mainly from the fast tracking of the inception of the Save CC and its constituent SCCs. The Plan that was drafted retained the traditional water management focus on surface water supply, to the exclusion of groundwater sources particularly for primary use in the rural areas. In particular, this focus did not take into account that surface water scarcity severely affects three of the seven Sub-Catchments in the Save Catchment Area, and that rural people in these areas rely mostly on boreholes and wells. The focus on surface water also failed to address the view by the new water policy that all water, whether it occurs as surface water, groundwater or other forms, constitutes part of the same watercourse system, and should be managed as such. The Catchment Planning process that was used therefore went against the ethos of IWRM.

The Department of Natural Resources (DNR), which is the sector mainly responsible for catchment protection in terms of the Natural Resources Act of 1996, viewed the lack of effective coordination and consultation as having resulted in the drafting of a Catchment Outline Plan that was based on inadequate knowledge of the environmental conditions within the Save Catchment Area. There was possibility therefore that some of the envisaged water development projects might have profound negative impacts on the security of downstream communities and ecosystems during periods of drought.

Local government sector officials considered that the lack of effective coordination and consultation in the catchment planning process had resulted in discrepancies between the needs perceived by councillors in the CC and SCCs and the actual needs perceived by local people. It is perhaps worth noting that in terms of the government's decentralization policy, the local government ministry, through local authorities, has the responsibility for coordinating local level service provision by the various sectors. This role includes the coordination of services related to primary water supply and sanitation. In terms of the new water policy, CCs and SCCs are vested with the responsibility for coordinating water resources use, development and management at the catchment level, which transcends the local authority administrative boundaries. The reported lack of coordination of functions between the river basin institutions and the local authorities might therefore have potentially critical implications on social security issues such as basic water requirements, livelihoods, health and sanitation.

The lack of effective coordination was ascribed by some local government officials to the lack of a synergy between the new Water Act and related Acts administered by other sector agencies. Hence, although the legal instruments were not necessarily in conflict, the local level articulation of policies by the SCCs and local authorities tended to dovetail. A closer examination of the mandates of the various water related sectors seemed to indicate that the problem lay also with the institutional actors' failure to develop new protocols of organizational behaviour in line with the recent shifts in the water sector.

Indeed, sentiments were expressed that there seemed to be some resistance by some established local authority actors to the new river basin institutions, who were felt to be usurping the political action space. In some cases, Rural District Council (RDC) personnel were said to have refused to participate in the sub-catchment planning process. Save CC records also showed that a key stakeholder local authority, the Mutare City Council, had failed to attend more than ninety percent of the meetings held up to the time of the research.

The lack of effective coordination was also due to overlaps in the relative alignment of administrative and catchment boundaries. The Save CC and the SCCs viewed some of the overlaps as inconvenient to ICM, and considered that certain portions of some SCCs be managed by adjacent CCs since the places were more accessible from those Catchment Areas. In the case of the Pungwe SCC, although the source of the Pungwe River was located in the southernmost portion of the Nyanga Rural District Council, the local authority did not participate in decision-making by the SCC. This was mainly due to poor accessibility, and the fact that the said portion of the Nyanga RDC was predominantly comprised of a National Park, under the jurisdiction of the Department of National Parks, and the Large Scale Commercial Farming sector. The latter was represented in the Pungwe SCC. While the Water Act of 1998 identifies local authorities within particular catchments as stakeholders, this situation points to a need for flexibility in the ICM framework in order to balance the legal requirement for stakeholder constituency representation with what is practically feasible at the operational level.

There were overlaps of functions in the institutional arrangement between ZINWA and the Save CC. The provision for the Catchment Manager, technically an employee of ZINWA, to perform water allocation seemed to set up possible conflicts of interest such that some decisions might reflect the interests of the water parastatal rather than the stakeholders. Some respondents attributed the absence of conflict, in the case of the Save CC and the Save Catchment Manager, to the compatibility of personalities between the Chairman of the CC and the Catchment Manager. It would seem as if although there has been a degree of devolution of authority to lower level institutions, there remains a desire by the state to retain a measure of control of local decision-making processes.

The problem of coordination might be ascribed, to a significant extent, to the power relations between institutional actors in the various sectors. Competition for control over the political action space was prominent between the new river basin institutions and the established local authorities. The latter have been responsible for coordinating development activities by the various sectors in the local administrative areas since the government's decentralization process started in 1984. By contrast, the river basin institutions have yet to strengthen their capacity to carry out ICM responsibilities and thereby instill confidence among various interest groups. Since the ability of an institution to perform duties vested upon it contributes to the acceptability of institutional content, procedures and processes, the problem of coordination by the Save CC and the SCCs would therefore appear to be linked also to the issue of institutional legitimacy.

Observation 3: Institutional Legitimacy

There seemed to be a plausible link between the problem of legitimacy of the river basin institutions and the top-down process of council formation and accession into office by SCC councillors within the Save catchment area by nomination rather than election. However, legitimacy does not only derive from a democratic process of accession into office by stakeholder representatives. Rather, legitimacy in water resources governance derives more strongly from the extent to which the stakeholder representatives are seen to balance the pursuit of the interests of their local constituencies on the one hand with those of the broader watercourse, national, regional and global resource communities on the other.

Sentiment was expressed that most councillors in the SCCs pursued self-interest or the interests of their constituencies at the expense of the interests of the broader local community. While interviews with the councillors could not fully verify this, primary observation showed that representation in the Save CC and the Pungwe SCC was heavily skewed towards representation by male members of the commercial farming sector. This seemed to have resulted in the preoccupation by the institutions with issues relating to the commercial use of water, particularly for irrigation purposes. Not much attention was given to issues of primary, industrial and recreational water use. Such omission raised questions on the commitment of the institutional actors to address the interests of stakeholders other than those of the majority constituencies represented.

The dominance of commercial farming interests seemed directly linked to stakeholder power relations and the requirement that the institutions should finance their operations through levies collected from commercial users. The focus on commercial water use resulted in institutional failure to address some of the major water problems within the Save Catchment Area. These included water pollution by some of Mutare's manufacturing and processing industries, and the primary water needs in many of the drier rural areas. With regard to the Pungwe water, the institutions seemed more concerned with the failure by Mutare City Council to attend the Save CC meetings than with the unaccounted for water loss of approximately 50% of the water obtained through the Pungwe Mutare Water Supply Project. It seemed as if water pollution and inefficiency in water use were less important than the levies that the institutions generated from Mutare's use of the Pungwe water.

In view of the fact that downstream Beira City in Mozambique relies on the Pungwe River flow to prevent the salt-water intrusions that cause water shortages in the dry season, the failure by the Save CC to address the wastage of Pungwe water by Mutare City Council is a significant omission of responsibility. The same can be said of the Save CC with regard to the failure to sanction the City of Mutare over the discharge of industrial pollutants into an urban stream that flows through a low income housing area in Mutare to rural farming areas.

Notwithstanding the observed shortcomings of the Save CC in demonstrating commitment to serve the interests of the broader resource community, the Pungwe SCC by contrast was found to have made a conscious effort to address more broadly the various interests ranging from the local to the international level. Such robustness was evident in the attempt by the SCC to enhance gender representation and in the expressed objective for the SCC to be directly involved in the interstate discourses concerning the use, development and management of the Pungwe watercourse. There was still need, however, for the Pungwe SCC to give the issues of representation and legitimacy a more rigorous treatment.

Towards strengthening institutional legitimacy, primary observation seemed to suggest that the discrepancies in the management styles of the Save CC and the Pungwe SCC owed more to personalities and stakeholder power relations than to any fundamental differences in organizational culture.

Observation 4: Power Relations

The issue of power pervaded the relations among stakeholders and between the river basin institutions and other sector agencies, such as local authorities and other government departments, and non-governmental organizations. Among stakeholders, power-distributing cleavages included gender, interest in water resources, political and economic clout, knowledge of the language of discourse, and personality.

Despite the fact that women have been identified as playing a central and multi-faceted role in the provision, use and safeguarding of water (UNESCO, 2000; Government of

Zimbabwe, 2000) their involvement in water-related decision-making structures was very low. The Save CC was wholly composed of men. Within the entire Save Catchment Area, women councillors constituted 3.5% of the total number of SCC councillors. Of the seven SCCs, the Pungwe SCC had made the greatest effort to actively involve women in decision making and planning, with women occupying 20% of the SCC seats out of the council's gender representation target of 60%.

In addressing the issue of gender representation, the Pungwe SCC could be seen as having been robust enough to adopt a gender-responsive approach, against the prevailing tide of social attitudes that militate against women's involvement in strategic decision-making. However, the inclusion of women in the SCC was largely due to the women's action in staking out a claim in the decision-making process, which appears to have been supported by the donor agency.

Such inclusion of women in decision-making structures, however, does not automatically ensure that women's interests are voiced, as there exist power relations between men and women that result in unequal gender voices. Primary observation of the decision-making process by the Pungwe SCC pointed to a need for the adopted gender approach to go beyond the issue of gender inclusion, and to enhance institutional capacities and mechanisms of ensuring gender empowerment and gender mainstreaming.

The competition between interests in water among the various stakeholders was manifest in the emergence of alliances among stakeholders belonging to the same sector. The small-scale and the large-scale commercial farmers seemed to have combined to form a dominant force in both the Save CC and the Pungwe SCC. This enabled them to direct the focus of the river basin institutions towards issues of irrigation.

The elected and traditional local authority representatives also voiced the primary water interests of their constituencies. However, because perhaps these representatives were a minority or because their constituencies did not contribute much to generating the levies required for CC and SCC operations, their clout in the decision-making processes was visibly the lesser. It seemed possible that had the Mutare City Council actively participated in the Save CC meetings, the local authority might have tipped the balance of power in favour of local government authorities. The City Council commands a significant share of the CC revenues raised through levies. Nevertheless, the non-cooperation by the Mutare City Council still seemed to have had a marked impact on the Save CC, whose councillors felt that City Council was undermining their authority and efforts in articulating the new water policy.

The power play between the Mutare City Council and the Save CC had also effectively denied the Mutare constituency the opportunity to voice their concerns with regard to water problems that affect them, such as water pollution, supply and sanitation. Furthermore, the City Council appeared to have shunted the responsibility of representing the residents of Mutare in the Save CC to water engineers employed by the council. Ironically, accountability to the Mutare constituency is presumably greater for the elected councillors than it is for the employees of the City Council.

The power dynamics between the Save CC and the local government sector also seemed to hinge on the issue of political clout. Whereas the latter had either established their authority over the years or through the ballot and networks, the former were only recently nominated. Consequently, the competition for political action space outside CC and SCC meetings tended to be dominated by the local authorities. While the roles of the river basin institutions and the local authorities were indeed complementary, the power relations between the two undermined the integration of water management activities at the local level.

Consequently, water resources management activities at the rural local level were divided into two distinct domains. Groundwater and primary water supply was the domain of the RDCs, who were mandated to coordinate the implementation of the government's Integrated Rural Water Supply and Sanitation Programme (IRWSSP). Despite that the new water policy mandates the CCs and SCCs with the integrated management of all components of a watercourse system, these institutions had so far avoided concern with groundwater and focused almost exclusively on surface water sources and commercial use of water. Atmospheric water, particularly as it related to the efficiency of water use in rain-fed and irrigated crop production, was also ignored. By reinforcing the traditional distinction between the various components of the watercourse system, the power politics between the river basin institutions and the RDCs contradicted the philosophy of IWRM.

The lack of an integrated approach in the management of the various components of the watercourse system seems to have been inherited from the pilot phase structure of organizational sector functions (Figure 8.3). The organizational functions were allocated according to the sources of water traditionally used or managed by the main sectors. Hence, while there was coordination by the Steering Group at the higher levels, there was no integration of functions at the lower levels of the hierarchy.

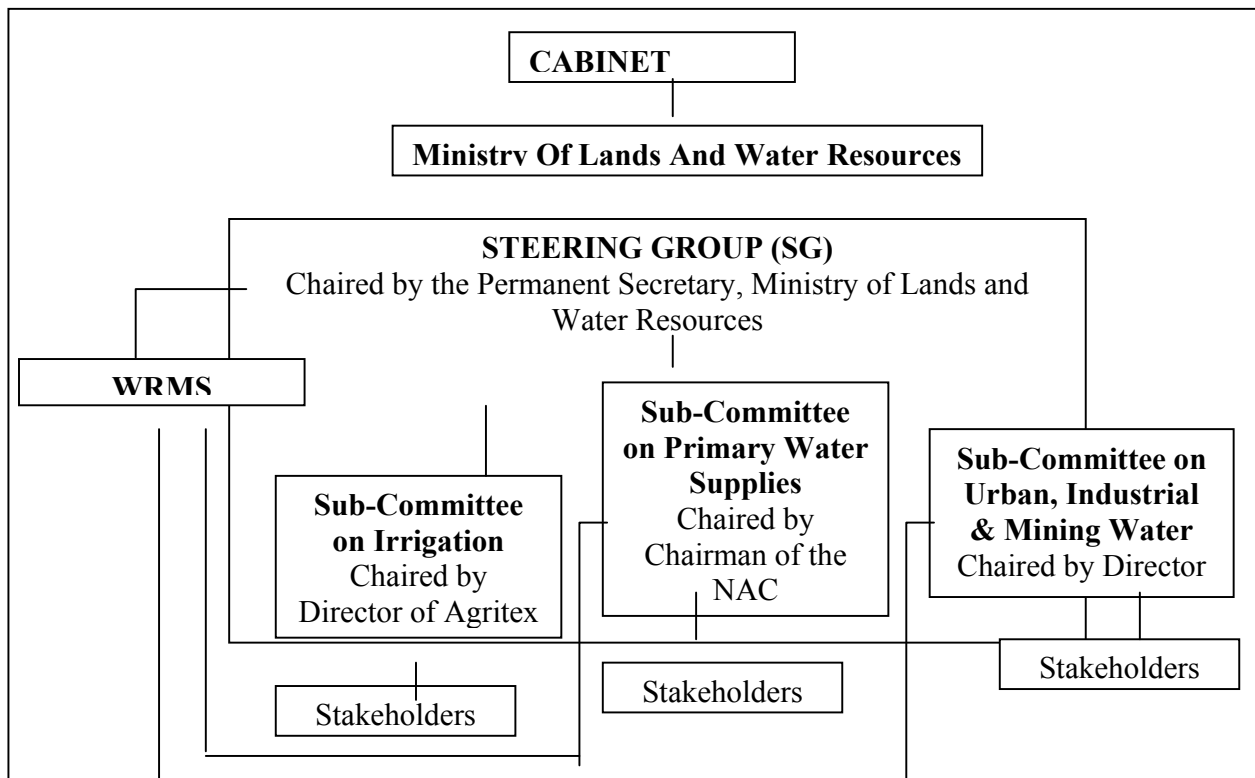


FIGURE 8.3 ZIMBABWE WATER RESOURCES MANAGEMENT STRATEGY: ORGANIZATIONAL CHART

Language constituted a source of power among stakeholders. Despite that many of the stakeholder representatives spoke Shona as their first language and that most of the other representatives were conversant in Shona, the language used in CC and SCC deliberations was English. In the observed Save CC meeting, this seemed to contribute to the difficulty of expression for some participants. By contrast, although English was also used in the Pungwe SCC, where 90% of the councillors were first language Shona speakers, the debates at the observed meetings were very lively, and councillors showed a remarkable command of the language and confidence in expressing their needs. Indeed, one of the vocal members of the Pungwe SCC had been reticent at the previous Save CC meeting.

A follow up to this observation revealed that the reticence by some councillors in the Save CC was due to the dominance of certain personalities, who made it difficult for most other councillors to participate actively in the meetings. This seemed to point to the need for the Save CC to enhance its capacities and mechanisms in using participatory approaches, so that the representation of stakeholder interests could be more effective.

Observation 5: Stakeholder Conflicts

Apart from the case of the women members of the Gatsi Irrigation Scheme, many of the conflicts that the river basin institutions dealt with concerned the issue of compliance in

the sharing of water for commercial use. The conflicts arising from differences of interest and perception between the commercial and primary users seemed to be lower on the scale of the councils' priorities. The councillors conceded that this was because at the time of the research, there was an abundance of water within the Pungwe River Basin and there was therefore less competition for water. Water-related conflicts between commercial and primary users often increased during times of water scarcity, such as during the 1991-1992 drought.

The Save CC and the Pungwe SCC had contrasting mechanisms for resolving stakeholder conflicts. This was due to the differences in the hierarchical positioning of the two institutions, and therefore differences in their scale of operations.

In the case of the Pungwe SCC, the general approach that had been found most effective was using the established customary regulatory framework to sanction against non-compliance, while avoiding confrontation. This involved subtly using social influence and moral obligation, as encoded in the non-formal customary law, to elicit compliance. Consequently water users who regularly exceeded their water allocations were compelled to comply or else face ostracism from the broader community and penalties from the community's customary court. The choice almost invariably made was that of compliance. It is worth noting that the effectiveness of the Pungwe SCC's conflict resolution mechanism rested strongly on the fact that there was a remarkably high degree of common cultural background among stakeholders, and that the stakeholders within the Sub-Catchment boundary comprised a relatively small, close-knit group.

The Save CC, by contrast, had to deal with conflicts at a much broader and more diverse spatial, cultural and sectoral scale. Consequently, the CC had to use the "user pays" and "polluter pays" principles, as well as impose other penalties encoded in the formal water legislation. The CC had on a number of occasions penalized non-compliant users by cutting off their water supplies. Ultimately, the CC could revoke the water permit of a non-compliant user. Although the expectation of such penalties tended to enhance compliance, the reduction of non-compliance had not yet reached the desired levels. This was due to the CC's limited monitoring capacity. Towards solving this setback, the Save CC showed a degree of robustness in that it had initiated an awareness campaign to foster the ethic of self-monitoring. The CC had also started the process of recruiting meter readers who would monitor water use on its behalf. Apart from these measures, the Save CC had in principle adopted the fractional water allocation system to facilitate the fair, prioritized and proportional use of water during times of water scarcity, when water conflicts tended to escalate.

Observation 6: Environmental Flows

The Preliminary Catchment Outline Plan for the Save Catchment Area had been drawn without sufficient knowledge of the environmental conditions within the catchment. The subsequent attendance of Save CC meetings by environmental and agricultural extension officers seemed to indicate that there was potential for this problem to be resolved. However, while environmental conservation measures do contribute to ecosystem

sustainability, the main difficulty in pursuing this objective was that there was no exact scientific knowledge with which to determine the critical levels of water flow required to maintain the environmental reserves. There was ongoing research on this issue at two sites within the Save Catchment Area, including the Pungwe-Mutare Project's in-take point. In addition to this, ZINWA's technical support unit had almost completed the database on the co-efficients of variation in river flows. This information was essential in providing a sound basis for decisions on water allocations for stakeholder use as well as for the environmental reserve.

Observation 7: Land and Water

The government's "fast track" land resettlement programme appeared to have become a key challenge to the implementation of IWRM. Many respondents expressed concern that the programme had resulted in the reduction of donor funding for many envisaged water-related projects. In addition to this the prioritization of the programme, in terms of local level expenditure, had interfered with the coordination of planned and budgeted social services between various sectors involved in primary water supply. The redirection of development activities and funding to the newly resettled people had also created gaps in the provision of primary water to identified established communities, thus perpetuating their insecurity.

Respondents were also keenly concerned about the plight of displaced farm workers, who seemed to have been marginalized by the fast track resettlement programme. At the time of the research, it was reported that about 34 000 farm workers would be displaced by the programme and 15 000 families resettled on the farms within the Save Catchment Area. Both the displaced workers and the resettled people would require coordinated inputs of services by the river basin institutions and other sectors, at a time when donor funding was becoming scarce.

The emergence of the newly resettled groups of people on the commercial farms demanded that the Save CC and the SCCs address the issue of representation of this stakeholder group in decision making and planning. There had also emerged a need for the Save CC and the SCCs to address the new requirements for access to water by the resettled people. However, no special concession had been made by these institutions to facilitate the representation of fast track resettlement farmers.

Although no clear-cut reason was given for this, it seemed as if the main reason was that the resettled people were viewed as being militant against any suggestion that they should pay the water permit application fees and water levies for commercial use. There seemed, however, to be no anticipation of difficulties in engaging the resettled groups of people about principles like equity in access to water, efficiency in water use and the sustainability of the ecosystem. The problem therefore was in trying to reconcile principles such as stakeholder participation and "the user pays" with the demands by the resettled people for free access to water and land.

In some cases, the resettled people co-existed with the established commercial farmers, who already had permits for the water on the farms. It was not easy for the councillors to arbitrate conflicts emanating from shared use of water whereby one party paid for the water while the rest were free-riders. On the other hand, there was the technical difficulty that in the event that all parties agreed to pay the permit application fees, how would the councils resolve the problem of issuing additional permits for the same allocation of water. Some representatives from the large-scale commercial farming sector expressed concern that while they were compelled by the law to continue paying levies for their water allocations, they were no longer able to use that water due to disruptions in production.

The “fast track” land resettlement programme indeed seemed to have introduced new dynamics in the power politics relating to the role of CCs and SCCs in IWRM. Whereas the tensions prior to this programme had revolved around the river basin institutions and the local authorities, the emerging political dynamics had since shifted to revolve around alliances of small-scale, large-scale and communal area farming sector representatives in the Save CC and Pungwe SCC on the one hand, and local government officials and resettled groups on the other. It seemed that the farming sector representatives in the river basin institutions were making a conscious though strained effort, in the spirit of conflict-avoidance, to be conciliatory in addressing the needs of the resettled groups.

Recommendations for going forward

Clearly it is early days in the water reform process in Zimbabwe and in the region. The current problems with land reform in Zimbabwe present researchers, policy makers and stakeholders with a difficult situation. In our considered opinion, the reform process is a worthwhile exercise, despite the myriad problems highlighted above. At the very least, we can use this period to take stock of the process thus far. To this end, we make five recommendations for going forward.

- **Vision: Sustainable IWRM Requires People with Vision**

Achieving sustainable and equitable water resources management is a multi-disciplinary exercise. It requires a number of people from a broad range of disciplines – engineering, ecology, agriculture, urban planning, industrial development, various social sciences, biology, hydrology, to name several – but all with a shared vision. To speak with those involved in the reform process is to see that in principle many share this vision, but in practice the ideal form is diluted and compromised. Underpinning the entire exercise is a seemingly non-negotiable philosophy of neo-liberalism. Its central tenets have been discussed above as have some of its negative consequences.

Most seriously, in our estimation, is the principle of ‘commercialisation’ emanating from this neo-liberal architecture. Moreover, this is reflected in a draft catchment management plan that simply lists 9 proposed development activities for commercial farming purposes. Clearly, most rural people are sceptical of this enterprise: how will commercialisation, user pay, full cost recovery, for example, impact not only on their

pocketbooks but on the very fabric of their society? In a neo-liberal world, there seems to be very little room for what Sibanda (2001) calls ‘cosmovision’. Water is central to that cosmovision – the way people locate themselves in the known and spirit worlds – but finds no place in a neo-liberal uniformly material world.

- **Finance: Even the Best Ideas Need Money**

Commercialisation is not the answer. Making the ‘sector’ pay for itself is not the answer. ‘Smart partnerships’ are not the answer. As stated above, the water ‘sector’ has been targeted by donors, governments and IFIs for seemingly logical or ‘common sensical’ reasons. But in the words of Mamdani (2002: 493), ‘is not common sense the name we give to that element of our historical legacy we have ceased to question ...?’ Because present forms of water resource development and use have developed over time, we have ceased to question the very logic of it.

In our view, it is time we confronted that logic. Again, to quote Mamdani (ibid.): ‘To confront that legacy is to unpack and question the common sense we take for granted.’ Water development reflects a history of inequality born both of colonial/imperial interventions and modernist ideology (for details, see Swatuk, 2002). Water has been developed to serve a narrow band of people. The way it has been exploited emerges from water-rich parts of the world embedded with wasteful practices. Water use and development reflects a regional developmental deficit. We must address these facts. To do so requires money. If governments, donors and various water-oriented NGOs are truly interested in ‘water for all’, they should put their money where their mouths are. The way SIDA, GTZ, DFID, NORAD and others have let themselves be swayed by political issues exposes the fickleness of looking ‘north’ for any sort of meaningful, long-term support. In truth, aid has always supported the donor before anyone else. We would do well to remember that fact.

- **Political Commitment: Widespread Support is a Must**

It seems to us that arguments in favour of ‘subsidiarity’ actually mask the real motivators for reform of the water sector: donor desire to generate business for their companies; Zimbabwe government desire to off-load the costs of managing the sector. But unmasking the questionable donor/government motivations, and hence their level of commitment to real change, does not alter the fact that many people brought into the process actually believe in its goals as articulated in the WRMS document ***Towards Integrated Water Resources Management***. The members of this project may be included among those who think this is a potentially progressive idea.

It is crucial, therefore, that we build on the positive elements that have emerged from this process, that we undertake dialogue to help get politicians and bureaucrats beyond various ‘turf wars’, that we act not only as researchers but as impartial facilitators, perhaps even as ‘knowledge brokers’. To paraphrase Marx, ‘it is not enough to understand the world; the purpose is to change it.’ Present allocation and usage is wasteful and inequitable: we must not lose sight of these facts.

If we hope to continue to have input from the wider world in the reform process, we also must work publicly to separate Mugabe's regime from the very real need for land (and hence water) reform in the local/global mind. Water reforms are far more than a technocratic exercise: they are a fundamentally political act. The sooner we admit this to ourselves, the easier it will be to engage the political process at various levels.

We must also strengthen the ties among allies – local, inter- and intra-institutional, regional, global – with the WATERNET forum being a particularly useful space for developing these linkages and making these points.

- **Participation: Sustainability Means Participation From Everybody**

Three of the most hopeful developments of the water reform process at Catchment level are, in our estimation, (i) the dialogue begun between large scale (white) commercial farmers and small scale (black) commercial, smallholder and indigenous farmers; (ii) the very meaningful outreach work undertaken by the CC training officer; and (iii) the clear vision for catchment development articulated, among other ways, in discussion with Mr. Murinyi, the Catchment manager. These are very real strengths that need to be built upon.

Unfortunately, recent developments in the 'land reform' process have seriously undermined the first development. Meanwhile, the pull back of donors has negatively affected the second. So, while the third development remains there for all to see and to discuss with the Catchment Manager, in the absence of the other two, the vision will remain just that – a vision, not a reality.

Given that the reform process came to be dominated by farmers at Council level, it was unavoidable that the process itself would grind to a halt under present circumstances. Rather than simply lament this fact – disappointing as it clearly is – we should regard this as an opportunity to rethink the way in which participation has been conceived and to try and re-envision ways in which it may be made more inclusive. As stated above, the heavy emphasis on commercial exploitation of water resources virtually ensured the farming dominance of the Councils. In our opinion, we should go back to the drawing board – including revisiting first principles. *Water is a human right*: we should begin from there.

- **Synergy: Building on what we know**

While we should rightly be dismayed, we should not be deterred by what has and is happening on the land. A great deal was achieved in the water reform process. What we must do now, as researchers, activists, practitioners and policy makers, is take stock, share information, speak to all those involved in the reform process and learn from their experiences. We must remember that water reforms taken in the spirit of IWRM are happening throughout the SADC region – there are experiences to be shared.

To this end, all those involved in researching the water reform process in Zimbabwe should work toward compiling data and centralising the research in an already established

library like that at the Institute for Water and Sanitation Development in Harare. We might also consider establishing a web-site where this information can be shared locally, nationally, regionally and globally. We must use our time and resources wisely. In the words of Antonio Gramsci (in Gill, 1995: 65), 'The old is dying, the new is being born, and in the interregnum there are many morbid symptoms'. The system will eventually settle; in the meantime, there are very real steps to be taken.

CHAPTER 9: TRACK 2 RESULTS:

CASE STUDY 2:

WATER SECURITY THROUGH AUGMENTED SUPPLY: IMPLICATIONS FOR POOR HOUSEHOLDS

9.1 The Pungwe-Mutare Water Supply Project

Throughout the Southern African region, large-scale water transfer projects have emerged as the preferred means by which to ensure water ‘security’ (Swatuk, 2000). At the same time, there has emerged a strong movement in support of managing existing water demand, sometimes in opposition to plans for increasing supply (Goldblatt et al, 2000). In this case study we examined the Pungwe-Mutare water supply project in the context of this emerging debate.

The city of Mutare, with a population of 150,000, is located near the border with Mozambique (see maps above). Mutare is a hub on the Harare-Beira Railroad, shipping the products of the surrounding district, including gold, tobacco, tea, grain, citrus fruits, and timber. Industries in the city include metalworking, distilling, textile weaving, food processing, sawmilling, and the manufacture of furniture, flour, and apparel. The city has auto-assembly plants and railroad workshops. It also is a resort centre, surrounded by scenic mountains and located near Nyanga and Chimanimani national parks. In the post-1994 context of majority rule in South Africa and peace in previously war-torn Mozambique, many in Zimbabwe believed that Mutare would reap the benefits of a regional peace-dividend by becoming the focal point of the so-called Beira economic growth corridor.

However, to do so, Mutare city planners believed quite correctly that a secure water supply must be had. The city suffered terribly from the greatest drought in living memory. The city in 1992 ran out of water and businesses closed down. Water was severely rationed. As a result, the economy shrank significantly, and unemployment increased. The general mood in Mutare was, this must never ever happen again (personal communication).

A number of supply options were considered. One was to build another dam on the Odzani River, thereby augmenting the storage capacity of the existing Smallbridge and Lake Alexander dams. A second option was to take water from the newly built Osborne Dam located on the Odzi River, 30km northwest of Mutare. A third option was to take water from the Pungwe River which is not part of the Save catchment. While requiring larger capital costs – in the order of USD 100 million versus USD 37 million for the Osborne dam option – the Pungwe River option ultimately held sway.

The reasons supporting this decision were several, both technical and political. In terms of technical support, water could be moved from the Pungwe River to Mutare via gravity whereas the Osborne option would require pumping. Secondly, given that off-take is near its headwaters, Pungwe water is pure and would require little treatment, whereas Osborne water being relatively turbid would require a lot. Lastly,

and perhaps most importantly, Mutare City Council wished to own the new water system, in order to be fully in charge. This ruled out the Osborne option, as the dam is government owned.

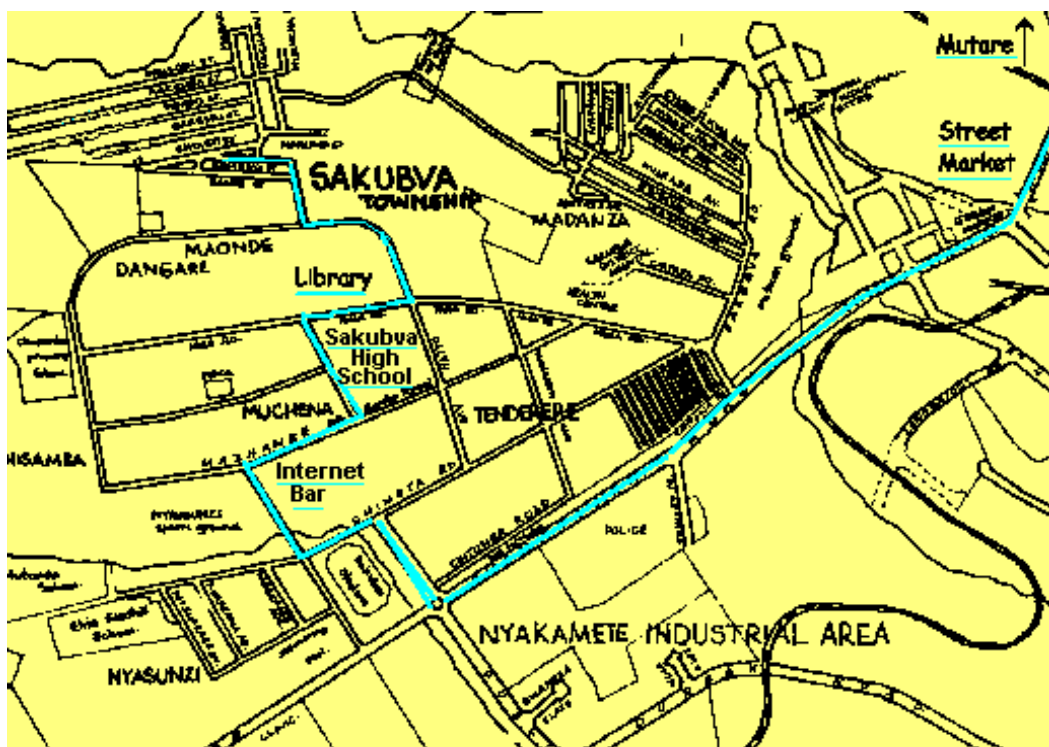
Importantly, a number of influential politicians were also behind the project, as were the Swedish International Development Agency (SIDA), the Swedish engineering firm, Skanska, and a number of other Nordic donors and banks. In the end, this coalition of forces combined to make the Pungwe-Mutare water supply project the ‘obvious’ choice. It remained for Zimbabwe and Mozambique to reach agreement on the amount of water to be abstracted. This was achieved in September 1995 when Zimbabwe’s Minister of Lands and Water Resources, Kumbirai Kangai (also ruling party Chairman for Manicaland province where the project was to take place) and the Mozambican Minister of Public Works agreed that Mutare would be allowed to take a maximum of 700 l/s, providing that it would always leave a flow of 500 l/s in the river at the point of abstraction.

The project got underway in December 1996 and was completed three years later. The project transfers water from the upper Pungwe River via Odzani water treatment works to the Christmas Pass main clear water storage reservoirs entirely by gravity. Flow enters a 4.3 km tunnel via a shaft then travels along a 46 km glass reinforced polyester pipeline to the Odzani water treatment works where it then enters the existing 26 km pipeline to the Christmas Pass reservoir. Elevation drops from 1700 metres at the point of offtake to 1319 metres at Christmas Pass (Inter-Consult, n.d.; see map above). The project is said to provide a safe yield of 22 Million cubic metres per annum, whereas others feel that this number is inflated, possibly by as much as 25 per cent. Clearly, many questions arise from the decision to draw water from the Pungwe River. Our concern, however, is with the claim that this new supply provides water ‘security’ for the residents of Mutare. In this case study we examined what Pungwe water means for the residents of Sakubva, a high density, low income suburb of Mutare.

9.2 *Sakubva*

Sakubva is located approximately five kilometres south of Mutare’s central business district (CBD). The township is divided into various sub-sections: Chisamba singles, Chisamba ownership, Chimoio, Chineta, New Dangare, Old Dangare, Devonshire, MacGregors, Mazhambe, Muchena, Mundembe, NHB, OTS (Old township), Tenderere, New Zororo and Old Zororo (see Figure 9.1). Built around 1910, Sakubva was originally designed to house 3,000-5,000 male workers for the nearby industries of Mutare. Today, the population of Sakubva is estimated to be somewhere between 50,000-65,000 (Tagwira and others, 2000: 4; Chirawu, pers. comm.). With an area of only 12.9 sq. km, overcrowding is a serious problem.

Figure 9.1 Map of Sakubva



- **Housing and population issues**

Housing varies throughout the township. For example, in the newer areas of New Dangare, Devonshire and New Zororo, free-standing houses have private water and sanitation facilities, many of which are in-house. Constructed mostly after 1990, the demographics of these areas show that overall the population tends to be older and more affluent (Tagwira, pers. comm.; Chirawu, pers. comm.; pers. observation). Most of these properties have metered water facilities. The other, older sections generally consist of single-room row-house style units (e.g. Old Chisamba), multi-unit two-story apartment blocks (e.g. OTS), or a mix of the two (e.g. Old Zororo). There is one multi-story apartment building at NHB. These housing units are organized around communal ablution blocks and standpipes. In several cases, private ablution and sanitation facilities were available but not functional (pers. observation).

If one uses a conservative estimate of 50,000 people resident in Sakubva, this translates into 3,846 people per sq. km. Population densities vary from sub-section to sub-section, however. For example, one study found there to be an average of 16 people per stand (pps) in Chisamba singles, 15 pps in NHB and OTS, and 14 pps in Chisamba ownership and Old Zororo (Tagwira et al, 2000: 7). What accounts for these incredibly high density rates is not simply the number of people occupying one room, or one legal structure, but the presence of many illegal structures, called shacks. Whereas the township has 6225 legal housing structures, many properties also contain four or more shacks.

Leaseholders also contribute to Sakubva's population problem by acting as landlords and 'letting' space to shack dwellers and others resident on a single plot. Even one room flats – so-called 'singles' – are home to multiple families, with space divided by

a single strand of string. For example, Tagwira et al (2000: 7) found an average of 8 people per room in Chisamba singles. Our own research revealed an average of 4 families *per room* in Matida Flats, a four-story apartment block in NHB section.

Sakubva's formal structures were originally built and let as council houses/flats. Today, they remain council-owned and operated dwellings for which the leaseholder pays a flat monthly rate of Z\$500 for all services.¹ These include water, electricity, refuse collection, rent, and the management of communal toilets.

In many cases, the leaseholder him/herself is no longer resident in Sakubva, having returned to the rural areas or moved to a lower-density, home-ownership area like New Dangare (pers. comm.). Thus the leaseholder becomes an absentee landlord who regards the plot itself as income supplement. On average, shack dwellers pay Z\$400/mth per designated space. In the case of Matida flats, it was found that the leaseholding family was usually resident, but had made a deliberate decision to partition the flat and rent out space.

• **Water Supply and Sanitation: Problems of Open Access**

According to residents and based on personal observation, Council services are erratic at best. Electricity supply is generally unreliable and of a voltage too low to operate durable goods like refrigerators and stoves. Refuse collection is said to take place once a week but the heavily potholed streets are home to large piles of rubbish, much of it organic waste. Services are much better in the newer home ownership areas, however.

With regard to water and sanitation, the vast majority of people resident in Sakubva are serviced by common block facilities. During the colonial era each block was meant to service 8 males. Today, these facilities cater for the daily needs of between 50-100 people (Chirawu, pers. comm.; pers. observation). In two extreme cases, however, we found there to be an estimated 386 people using one facility in Muchena and more than 1,000 using the double-sized facility next to Matida Flats at NHB. Typically, each ablution block is divided into two sides: one for men and one for women. The toilet is a hole in a cinder block floor. Directly above this 'toilet' is a pipe that serves as a 'shower'. There is also a separate room for showering, usually with two water outlets. It is common practice in the township for people living in one section to 'search out' ablution blocks that are relatively clean but which may be in another section. Queuing for a shower in these blocks is a way of life, with many people rising as early as 4 a.m. to use facilities before their condition deteriorates through the day.

Water for household purposes may be drawn from standpipes, from pipes emerging out of the back of the ablution blocks, or from areas designed for the washing of clothes and household utensils. This latter area may be physically part of the ablution facility or may stand separate from it. As early as six o'clock in the morning, women can be seen queuing to do their washing. People collecting water for household purposes – in every observed case either a woman or a girl child – are allowed to

¹ At the time research was conducted (June/July 2001), the official exchange rate was USD 1 = Z\$56. However, the parallel market exchange rate was, on average USD 1 = Z\$140.

jump the queue. All manner of container is used to collect this water: from 2 litre plastic bottles to large buckets. The means by which people collect water is important when considering proposed solutions to problems of access and water wastage (see below).

The flat rate system also encourages commercial water use in Sakubva. For example, many people are using water meant for primary purposes in brick- and tombstone-making, hairdressing, carpentry, vegetable and flower growing, to name several common activities. Seven brick- and tombstone-making enterprises were identified in Sakubva, each consuming on average about 500 litres of treated water per day. In these businesses, a tombstone fetches Z\$2500, airbricks are sold for Z\$20 each, and standard building bricks for Z\$30 each, yet the entrepreneur – if a leaseholder – only pays City Council Z\$500/mth for all services. One brick-maker expressed a willingness to pay for water provided it is brought nearer to his workplace. At present, the communal block where he accesses water is approximately 50 metres away.

In areas like OTS, most people grow vegetables along the Sakubva River both for subsistence and for sale. While it is a fact that this entrepreneurship has been influenced by a high rate of unemployment in the area, one can say it is also facilitated by the availability of free water.

Numerous problems have arisen in relation to these common block facilities. First, while people feel entitled to access (by virtue of being either a leaseholder paying the required Z\$500 monthly flat rate or a 'renter' paying the leaseholder the required Z\$400/mth) there is no sense of ownership or responsibility over these resources. For example, in response to our suggestion that perhaps local people should manage their own sanitation facilities, one respondent said, 'What for? We pay Council to come and clean.' Another said, 'How can we manage these facilities when they are used by people from all over?'

In effect, the ablution blocks are treated like open access resources. This tendency is reinforced by two complementary factors: first, the transient nature of the population; second, the non-residence of leaseholders in the highest density areas. In terms of the first factor, since Zimbabwe's independence in 1980, Sakubva has increasingly served as a dormitory suburb for often seasonal migrant labour. Given Mutare's proximity to South Africa, Mozambique and Malawi, and its relatively sophisticated agro-industrial economic base, many people from the region migrate here in hope of finding work. As a result, there is no guarantee that the people living in Sakubva are going to be the same from month to month, or, if they are, they move from shack to shack and area to area in search of better accommodation (personal observation). With regard to the second factor, leaseholders have sought to exploit this constant demand for occasional housing by turning their plots into rental space. Hence there seems little chance of turning an open access regime into a common property resource management one.

Second, vandalism is widespread, with the stealing of brass tap heads and nozzles a common practice. Tap heads are usually melted down into coffin handles or other useful items and sold in the open market. Sometimes the entire fixture is removed and sold, often ending up in wealthier home-ownership dwellings.

Thus, a third problem is that in all the communal ablution blocks water runs 24 hours a day. Sometimes residents use small sticks of sugar cane or rags and elastic bands to stop the flow from one or more open pipes. More often, however, nothing is done. In consequence, there are massive visible water losses in Sakubva estimated by the City Engineer to be 90% of all water delivered there (Nyatoti, pers. comm.). City Council is well aware of this problem. When queried as to why tap heads were not replaced, the City Engineer responded, 'In the past, when we tried replacing them, we found that replacements were often stolen before the end of the day' (Nyatoti, pers. comm.).

A fourth problem relates both to the number of people using these facilities and the fact of ever-running water. Toilet drains are often blocked. Blockages are partially the result of the fact of numbers: too many people overstress a system designed to cater for one-seventh of the present population. At the same time, blockages are exacerbated by the use of newspaper instead of toilet paper. While Council regularly attends to these facilities, the system itself is unable to cope with the demands made upon it. Burst pipes are common while repairs can take weeks. The various overflows of waste and clean water often end in stagnant pools or streams which flow directly to Sakubva River. This was a particularly common sight in OTS section. It is interesting to note that, on its way to Sakubva River, some of the overflow of pure water from open standpipes is harnessed for agricultural purposes -- a good use of otherwise wasted water. However, these initially treated waters do become health hazards. For example, dysentery is commonly transmitted when hands with faecal contamination come in contact with stored water. This is not uncommon owing to the high number of young children in this area. Children can often be found playing in areas near river banks where human waste is openly visible. At the same time, Tagwira et al (2000: 9) report that in Chimoio, NHB and OTS toilets are also used for cleaning pots and food utensils. The Sakubva Health Clinic reports that it treats on average 150 patients per day of which, over the course of a year, 36 per cent are seen to be suffering from tuberculosis and 25 per cent from cholera, diseases whose incidence correlates directly with the poor sanitary conditions in the township (Tagwira et al, 2000: 13).

9.3 The Benefits and Costs of Pungwe

In general, residents of Sakubva are satisfied with water supply. Indeed, respondents in the Tagwira et al study (2000: 11) went so far as to say that City Council 'should be commended' for ensuring a steady supply of clean, albeit in their estimation *expensive*, water. This is the one clear, undeniable benefit of the Pungwe-Mutare water supply project for the residents of Sakubva. However, in guaranteeing supply, City Council has exacerbated existing problems, three of which will be highlighted here. First, provision of constantly running water into over-crowded conditions worsens already unsanitary living conditions and creates new health hazards where previously there were few or none. Second, City Council's commitment to full cost recovery worsens its long-problematic relations with the residents of Sakubva. Third, attempts at ameliorating problems of 'over-subscription' and 'wastage' -- requiring demand management interventions -- are made more difficult by having already introduced a new, steady supply: tantamount to a new variable in an already complicated situation. As we have described the first problem in an earlier section, we will focus on the latter two issues.

9.4 Managing the Situation

• Recovering Costs

In April 2000, City Council adopted a mixed, fixed/block tariff pricing structure (see Table 1). In setting the price for water Zimbabwe's stated guiding principles are "water as an economic good" and "users pay" (Government of Zimbabwe, WRMS, 2000). This position reflects the Hague's *World Water Vision*: "The single most immediate and important measure is the systematic adoption of full-cost pricing for water services" (in Kasrils, 2001: 52). But Zimbabwe is a deeply unequal society, so to "provid[e] access to basic clean water supply is a direct attack on poverty" (Kasrils, 2001: 52). In Sakubva, the flat rate of Z\$25/mth is charged in the communal block areas as part of the Z\$500/mth per stand Council rate. The block tariff structure only applies to areas where people have a metered tap.

Table 9.1: Fixed and block tariff structure of Mutare

Domestic	Commercial	Industrial
Fixed - Z\$25.00/month	Z\$102.00/month	Z\$84.00
0-10m ³ - Z\$3.69/m ³	1 – 300m ³ - Z\$10.20/m ³	>0m ³ - Z48.40/m ³
11-30m ³ - Z\$5.45/m ³	>300m ³ - Z\$12.00/m ³	
31-60m ³ - Z\$12.00/m ³		

Source: Mutare City Council

In addition to the low density, high income areas of Mutare, the CBD and the industrial sites, this includes the home ownership sections of Sakubva, like New Dangare, where water is metered. At the same time, there has been some effort to provide private, metered water and sanitation facilities to households in the older sections of the township, physical space permitting.

The existence of effective water metering is fundamental to proper water management and pricing (Goldblatt et al, 2000). However, in Sakubva there is no effective water metering and monitoring. Existing meters often do not work. In many observed cases, where meters were working, home owners claimed that they functioned haphazardly at best. As a result, meter 'readers' simply made estimates regarding water use. Home owners claimed that these were highly inaccurate over-estimations and were often unwilling to pay. City Council, while acknowledging that these are usually nothing more than 'wild guesses', claims that they are in fact gross *underestimations* (Chirawu, pers. comm.).

Families with metered supplies in New Dangare were found to be paying Z\$400-600/mth including connection fee. These are costs considered both unfair and unaffordable by residents. While many times higher than the flat rate, these charges fall far below that necessary to cover City Council's operating costs (Muskwe, pers.

comm.).² However, this evidence seems to confirm resident claims that they are being overcharged for water, since households would have to be consuming 40-50 cubic metres of water per month to incur such a cost.

Disconnection for non-payment is the most common demand management strategy practiced by Council. However, illegal reconnection is also common. Where residents were aware of illegal connections, in no case were they willing to inform Council. Where access to common block water is also available, households having been cut off by City Council simply revert to its use. Clearly, until water in the whole of Sakubva is metered and these meters are properly maintained, water pricing will remain contentious.

Recovering the cost of water provision and other services is also something of a political issue. More than one-third of Mutare's population resides in Sakubva. The township constitutes a powerful vote base that can make or break political careers. The Executive Mayor of Mutare, Lawrence Mudehwe, hails from New Dangare and, until recently, still resided there. In addition, Sakubva stands as a living symbol of the consequences of colonial race/space engineering. In spite of 20 years of majority rule, there remains a strong tradition of resistance to authority. Thus, when questions of 'full cost recovery' arise, the general attitude of those living in Sakubva is: let those in the low density suburbs pay.

• **Managing demand**

Water demand management is defined as an approach that aims to reduce, restrain or reschedule the demand on water resources (Government of Zimbabwe, WRMS, 2000). This stems from the realization that water is a finite and increasingly scarce resource. To this end, Mutare City Council has pursued a number of strategies to control what they describe as 'wastage' and 'over-subscription' of water resources. Not only have these approaches failed to control demand, they have served also to exacerbate tense relations between residents of Sakubva and City Council. Part of the problem is that measures are, in every case, punitive. For example, in 1995-96, in its desire to control unchecked population increase – hence, 'over-subscription' – and with the blessing of the Minister of Local Government, City Council commenced bulldozing shacks (Muskwe, pers. comm.). This practice was stopped only after widespread public outcry. Similarly, where vandalism resulted in the loss of tap heads, City Council's past strategy was to cut off water supply to that particular communal facility – in effect, making everyone pay for the action of one or a few individuals. In the past these actions were taken without consulting affected communities. Moreover, residents feel that they are being punished for a situation not of their own making: cooperative and pro-active strategies for managing both supply and demand should have been mapped out prior to the introduction of Pungwe water.

9.5 Possible solutions

² Indeed, according to Murungweni, while the price paid for water in Zimbabwe dollars has increased dramatically in the last ten years, when measured in U.S. dollars it has actually decreased by two-thirds (pers. comm.).

City Council has proposed two ‘solutions’ for managing demand: the development of water kiosks and the levying of shacks.

- **Water Kiosks**

Under this proposed strategy, City Council will sell water to one person and this person will be responsible for the management of water at a water point. In effect, this is tantamount to privatizing water provision. Residents will buy water from the water points using tokens. It is anticipated that water at kiosks will cost Z\$8 per cubic metre. Thus it will cost a household roughly Z\$4/day since they are estimated to use +/- 400 litres/day. However, Engineer Muskwe is of the opinion that Z\$4 is too much since most Sakubva residents live “below the bread line”. If he is correct, implementation would mean that people who cannot afford Z\$4/per day would get no water. There are many other questions that beg answers: How many and where will water points be located? On average, how far will they be from households? How is it envisioned that people will carry these 400 litres of water? And who is to do the fetching? Is this to be another task heaped upon women? Far from a viable solution, water points appear to us as an attempt by City Council to pass to the private sector a problem partly of their own making.

- **Levies on Shacks**

City Council has proposed to levy all shacks in Sakubva. Council has proposed monthly fees of Z\$75 and Z\$50 for metered and non-metered services respectively per residential shack. Each stand is to host no more than two shacks. The owners of commercial shacks are to pay Z\$300 and Z\$200 for metered and non-metered services respectively. Attempts by the City Council in June 2000 to enforce service charges on shack dwellers backfired, however, as they were forced to back down after a successful protest. However, City Council is adamant that it will carry this proposal forward once the relevant by-laws are in place.

Clearly, this strategy has negative and positive implications. On the positive side, it will generate money for improved services. It will also introduce differential fees for the commercial use of services. On the negative side, it is unlikely to significantly change the fact of overcrowding. Neither is it likely to help relieve the stress on existing services. A per shack levy is not a disincentive to live in Sakubva. Nevertheless, revenues generated may help City Council to improve services.

9.6 Alternative Solutions?

Our research led us to suggest several possible alternative solutions to water and waste management in Sakubva. These were disseminated to the City Council and to the Health Officer in July 2002.

Clearly, the problems of Sakubva are complex and historically-rooted. Dealing effectively with them, then, must begin with acknowledging these roots. This means, at minimum, moving beyond a top-down management style that has long nurtured confrontation between local authorities and residents. Thus, we believe that pro-active forms of demand management can only be effective if Council respects the interests of local residents. While punitive measures must remain an option, they should be a

last resort. The ideas we put forward here emphasise pro-active cooperation and networking.

- **Proper planning for population growth**

Without doubt water wastage and over-subscription, as well as poor sanitary conditions stem from the poor fit between numbers of people and scale of infrastructure and services. For the ever-increasing population of Sakubva, therefore, projects or programmes have to be properly planned now as failure to do so will only make matters worse. Effectively dealing with challenges of population include several related aspects. First, controlling influx. Second, providing space. Third, dealing with natural increase. In order for the City Council to recover the costs for the services they provide, *registration of families* with the City Council can help. Instead of levying a shack, every registered family can be made to pay a certain amount of money for the resources they use. In Sakubva there are many families in one stand, sometimes having two or more families in one shack. Levying a shack in a stand would not help reduce overcrowding. Absentee landladies/lords would still make a huge profit. Furthermore, registration may discourage influx of illegal immigrants.

In terms of providing space, the creation of outlying suburbs has not been a total failure. *Incentives* should be put in place – e.g. site and service; lower property levies; tax holidays – encouraging people to move to other suburbs. Key here is to raise revenue in the case of registration so that it may be used not only to improve services but to subsidise movement out of Sakubva into outlying areas. Changes must also be made to the property tax/service structure. Where leaseholders are actually absentee landlords, properties should be considered commercial ventures and taxed accordingly.

In terms of natural increase, a concerted outreach programme must be developed so that both men and women in Sakubva are educated about *choice*. Evidence shows that where women have choices made available to them, they have – regardless of social class – chosen to have fewer children and/or to space out births over a longer period of time.

- **Community participation at all levels of resources management**

Most Council strategies have failed because they have been met with community disapproval. Historically, few City Councils anywhere have involved local people in the planning of resources management. When asked about the extent to which the community has been involved during the development of present initiatives, one of the engineers in the City Council said ‘We do not think we can get a better method from them’ (pers. comm.). The residents of Sakubva discard these initiatives because they do not feel they own them. A continuing focus on punitive measures combined with an adversarial style of politics driven by particular individuals has led the people of Mutare and the township of Sakubva down a dead end road. Politics is about choices: people can choose to act differently in order to create partnerships and better working relations.

To this end, alternative sites of cooperation and community-authority dialogue must be nurtured. Granted, the highly mobile nature of Sakubva’s population militates

against the spontaneous emergence of these sorts of social organizations and/or movements. However, there are many long-term residents who may form the core of any such organization. To undermine the negative energy of extant official relations between Council and residents – most clearly demonstrated through forums like the Ratepayers' Association – we are suggesting that coalitions be built around specific issues: e.g. refuse collection; health; vandalism of common property; management of ablution blocks.

- **Training of community members**

Training is important and has been effective elsewhere. For example, in the case of townships in South Africa, residents have been trained as community plumbers and as pump mechanics. This can save both water and money as much money is used to purify water lost through leakages. It can also instill a sense of ownership within the community, or among members of the community.

- **Involvement of the youth in community mobilization**

In Sakubva, the youth – particularly unemployed youth – are playing an important role in the campaign against the spread of HIV/Aids and drug abuse. They are doing this by mobilizing their peers through sport, and counseling those who are already HIV positive. These youth can also play a crucial role in mobilizing the community of Sakubva towards effective use of water and, perhaps, in policing/managing water points/ablution blocks. Ways should be devised so that youth benefit both monetarily and through acquiring skills – purely voluntary activities will eventually wither and die. Based on our direct experience with these youth groups, it seems to us that the youth can form the positive core of social mobilization we anticipate above.

For example, in the streets of Sakubva heaps of rubbish are a common, unfortunate sight. This organic waste can be used productively as compost by individuals, by households or by collectives. Urban agriculture is a common practice in Sakubva. Youth can develop community gardens, producing vegetables fertilized through wastes that, at the moment, are a health hazard to the community.

- **Involvement of non-governmental organizations (NGOs) in the management of water**

Perez (2000:13) observed that major constraints to providing environmental services to the urban poor are the lack of political will, legal mandate, and technical and institutional capacity of municipalities. This is no less the case in Sakubva. In Zimbabwe, NGOs are playing an important role in the management and extension of water and sanitation facilities to the rural poor. The involvement of SNV and Plan International in Nyanga and Mutasa communal areas, for example, demonstrates that NGOs can fill the gap. Many NGOs are socially committed, flexible and able to improve their ability to work effectively with poor communities. The key to their success is setting aside their normal NGO role as 'implementer' for a new role as 'facilitator' or 'broker' between the informal communities and the formal private and public sectors (Perez, 2000: 13).

If Mutare City Council or, indeed, Zimbabwe national and provincial governments are paralyzed by political infighting, a lack of capital, or a shortage of human and technical resources, the only way around may be to invite NGOs in to do what government should be doing. Communities or NGOs themselves may need to initiate these sorts of linkages. Community leaders in Sakubva could establish a web-site, perhaps, and solicit 'linkages' for specific projects (sanitation, water supply) – not only with NGOs but universities, cities, companies and the like. Once again, the youth of Sakubva could play a crucial role here.

- **Involvement of women/ youth as common block managers.**

Experience in most rural areas of Zimbabwe shows that common pool resources such as boreholes and wells, can be effectively managed by water users themselves. In these areas, water point managers are elected. Duties include ensuring that water points are clean, reporting leakages and determining the extent to which people can practice subsistence farming around the water points. These people are usually women because water has historically been regarded as 'women's domain' in Africa.

In Sakubva, women can also play a crucial role in the management of the common blocks not merely because they spend most of their time using the common blocks for doing washing, fetching water for drinking purposes and bathing. Empowering women as managers should mean giving decision making power – including fees levied and distribution of profit – to those who are primary users *because they are primary users, not because they are women or because it is the 'women's domain'*.

Too often 'community empowerment' means burdening those already over-burdened with 'voluntary' tasks. Because women are relegated to the 'private domain', these 'social' activities too often fall to them. In other words, the language of 'empowerment' does nothing to alter existing structural inequalities. If water point management is to succeed in Sakubva, then, some creative combination of government (capital, technical and human resource) support, user-pay fees, and monetary- or other-incentive structure for female, youth, or a combination of the two as managers must be put in place. To succeed in the long-term these programmes must be something other than simply relief-oriented, 'food for work'.

At the same time we feel it is important to highlight the fact that poorly managed common blocks, lacking electric lighting for example, become threatening places for women and youth after dark. To remove the threat, and to facilitate a better use of the resource for all, it is most important to empower those most threatened.

In addition, the driving force behind these new township water management structures must be something other than abdication of responsibility on the part of government, at whatever level. We therefore do not envision 'water point management' as equal to the 'kiosks' Council wishes to impose. Rather, we envision the emergence of creative networks and smart partnerships involving perhaps local residents, NGOs, and City Council.

This research clearly illustrates that without appropriate water management systems and institutions, that are socially and economically sensitive, attempts to address 'access to water' fails dismally. Until these complexities are better understood, dealt

with and incorporated into scientific or technological ‘supply solutions’, overcoming these major ‘water problems’ in the region will not be possible. While the research focused on one high density suburb, given the similar nature of urban settlement patterns throughout Southern Africa, there are very clear lessons for the entire region to be learned here.

CHAPTER 10: TRACK 2 RESULTS:

CASE STUDY 3: URBAN AGRICULTURE AND FOOD SECURITY

10.1 Land and Water

Our final case study focused on urban agriculture as a means for ensuring food security for peri-urban households. Often times the argument is made that water resources management cannot be successful if considerations are not given to how land is managed – hence the concept Integrated River Basin (as opposed to Water Resources) Management. While it is clear from the study of institutional change above that problems on the land can create insurmountable problems for the successful management of water resources in rural areas, there is relatively less said about the role of urban land in water resources management issues. Thus, this case study looked very closely at the interrelationship between land and water through the very appropriate lens of strategies for food security in peri-urban areas.

10.2 Urban Agriculture

Mbiba (1995) defines urban agriculture as the growing of food crops on urban zones that urban managers have reserved and designated for urban functions other than agriculture. It is undertaken on built up zones or at the periphery of the urban area. Some include in their definitions the production of crops for fuel by city dwellers (Henk de Zeeuw, 1998). Urban agriculture takes place within the boundaries of the city (intra-urban) and sometimes further away from the city centres (peri-urban). Urban agriculture also involves the marketing of products including street vending mostly done by women and children.

10.3 The Reasons for Informal Urban agriculture

Recent surveys suggest that the locus of poverty is shifting towards urban areas making food security and malnutrition a problem of both the urban and the rural (Haddad et al, 1998). This makes the opportunity to grow or acquire locally produced food an important component of the urban environment (Nugent, 1997).

Food insecurity or perceived risk of food insecurity is common among urban dwellers (Nugent, 1999). According to Jacobi et al (2000) urban food production is a response by the poor to inadequate, unreliable and irregular urban food supplies. He attributed this to lack of purchasing power, natural disasters and lack of formal employment in the cities. These authors define urban agriculture, particularly its off-plot variety, as a ‘crisis induced strategy’ ensuring the survival of poor segments of the city. Sawio (1999) somewhat differently pointed out that urban agriculture is a result of increasing urbanisation and the increase in market demand for food from population growth.

For formal authorities, off-plot urban agriculture is generally not considered a legitimate urban land use. It comes into direct conflict in the provision of land with other urban land use functions such as industrial, residential and commercial. Often unsubstantiated negative environmental and public health impacts are used to campaign against urban agriculture. However, it is generally agreed that if urban agriculture is not properly managed and planned it can cause environmental and

public health problems. Urban agriculture can pollute water sources through the use of agro-chemicals; result in environmental degradation and bring ill-health to people by attracting disease-carrying pathogens. This has resulted in city farmers facing severe political and regulatory obstacles including legal action and confiscation of their products. In Zimbabwe, local authorities have traditionally responded to off-plot cultivation by slashing crops (**Manica Post**, 24/01/2002).

The position taken by this research is that, if informal urban agriculture is officially sanctioned and promoted, it could become an important component of urban development. Food will become available to poor urban dwellers. Benefits and risks will be addressed through active policy making and practice and the negative impacts can be minimised.

10.4 Gender Dimension of urban farming

Women bear the harsh negative impacts of economic recession and this has adverse consequences on their status as producers, home managers, mothers and community organisers (Hasna, 1998). Policies and practices tend to exhibit some form of gender blindness. The needs of women have not been adequately addressed in urban agriculture (Hovorka, 1998). Little official consideration has been given to the potentially positive role of urban agriculture to both household security and women's empowerment despite the undeniable fact that women in urban and peri-urban areas are actively practising it.

Indeed, women make up the majority of the participants in urban agriculture. They provide labour and are involved in street vending with help from children. Africa has the largest proportion of women involved in urban agriculture. This is derived in part from their traditional responsibility as subsistence producers and preparers of food for the household (Jacobi et al, 2000). Women use urban agriculture as an alternative to formal sector sources of income, food and employment: it is therefore also a logical response to gendered practises which exclude women from active participation in the public sphere.

Hasna (1998) observed that economic reforms are increasing the number of men in urban agriculture as they lose their jobs in the formal sector of the economy. This has tended to balance the ratio of female to male urban farmers. It also intensifies competition for land close to urban centres thereby posing a threat to women's access to land. However, Quisumbing and others (1995) demonstrated that women are still able to achieve their objectives despite unequal access to land, inputs and information.

Gender should be seen as a cross cutting issue of major importance in planning and implementation of policy interventions in urban agriculture. Gender sensitive planning will help policy makers arrive at more robust policy practices, combining female empowerment, increased household security and more sustainably managed urban spaces.

10.5 Urban Agriculture In Zimbabwe

The rise of urban agriculture in Zimbabwe is attributed to economic hardships that first arose following the adoption of structural adjustment conditionalities (ENDA-

Zimbabwe, 1996; Mbiba 1995; Gumbo, 2000). Studies conducted by ENDA-Zimbabwe in Harare and Gweru revealed that people started growing crops for food as a response to urban poverty.

Legislation in Zimbabwe is not clear on urban agriculture. The Minister, through the Regional Town Planning Act, has the power to stop agriculture if it is likely to cause fire, environmental and health problems. This piece of legislation is commonly used to stop the growing of crops in urban areas. The attitude of urban planners has been repressive and inconsiderate (Mbiba, 1995). Local authorities view urban agriculture as demanding a significant proportion of urban land and having many negative environmental and health impacts. Over the period 1990-1, the City of Harare mounted a concerted attack on urban agriculture. This coincided with the implementation of ESAP, the enhanced structural adjustment programme, agreed to with the World Bank and IMF in late 1989. The attack was considered 'colonial and male' by mostly women practitioners (personal communication). With time, and as economic hardships have worsened, local authorities have tended to exercise some degree of compromise and leniency but no real policies have been put in place.

Urban agriculture takes the form of crop cultivation on home front and in backyards (i.e. 'on-plot' cultivation) where vegetable and fruit are produced and poultry, rabbits and other small livestock are raised. It also takes place in the form of cultivation in open public spaces around the built up city environment ('off-plot') where maize and sweet potatoes are the main crops. The unregulated use of off-plot "public" space has been a major worry to urban authorities.

Whereas, historically, urban agriculture has been considered an illegitimate form of urban land use, recent socio-economic problems in Zimbabwe have led members of Parliament to formally move to recognise urban agriculture as an important urban household food security practice (Government of Zimbabwe, Hansard, 2000: vol. 27:27). Presently, discussions are being held at higher levels but they seem to be overly influenced by politics rather than a firm desire to see urban farming formally integrated into urban planning. Nevertheless, in mid-2002 the City of Bulawayo regazetted public land as legal space for urban agriculture. No doubt similar decisions by other City Councils will follow.

Whatever politicians decide, more and more people are turning to urban agriculture. Town planners need to consider it as a *de facto* legitimate urban land use. Moreover, our findings suggest that environmental and social costs will be averted or minimised if the local authorities consider investing proper control of farming through training, extension and other inputs.

10.6 Urban Agriculture in Dangamvura

10.6.1 Dangamvura

Dangamvura is a high-density residential area under the jurisdiction of the City of Mutare. It is located about 5 km to the west of the city centre. While accurate population counts are difficult, it is clear that Dangamvura currently absorbs a large number of people migrating from rural areas in search of employment. In addition, Dangamvura historically serves as a dormitory suburb for workers commuting daily

to the city centre. The few income-generating projects located in the township include vegetable and firewood vending as well as corner tuck shops selling groceries. Those who cannot afford school fees and food get assistance from the Department of Social Welfare. Some get assistance from NGOs in the form of food packs and clothing. This assistance is increasing in significance because of ever-rising costs of living.

10.6.2 The physical layout of Dangamvura

Dangamvura is divided into sections with different types of housing units. Some sections have blockhouses and public ablution facilities. Others have back-to-back row houses while others have single houses, both forms with in-house plumbing. The sub-divisions are designated as A, B, C, N, P and T Sections and Areas 3, 7, 12, 13, 14, 15 and 16. Those sections first constructed have smaller plots; those built recently have bigger plots. Unlike the Sakubva case study discussed above, there is no real land shortage in Dangamvura. The majority of stands are well fenced, dura-walled and gated while others are not. Many houses have been extended to cater for the needs of the households. Given its more recent construction than the older Sakubva township, the vast majority of houses in Dangamvura have in-house tap water and toilets supplied by the City of Mutare.

Rates, water and electricity are paid to the City of Mutare, the costs of which are a major worry to residents. Rates have been increasing and residents feel this is unjustifiable. Residents have a history of successfully contesting rate hikes, both informally and formally through the court system.

10.6.3 Urban agriculture in Dangamvura

Authorities have treated off-plot urban agriculture as an illegal activity. City Council have slashed crops in the name of environmental protection but this has failed to stop people from farming. Informal urban farming is widely observed in the township and most of the households have vegetable beds in the yards, crop fields away from the houses, and poultry and other kinds of livestock raised on-plot. The few that do not have any form of agriculture are ridiculed as *nyope* (Shona for ‘lazy’). This encourages residents into farming because they do not want to be called lazy.

Most respondents cited economic hardships as their main reason for growing crops. The rising cost of living, inflation and limited employment opportunities in the city have resulted in an increase in the poverty levels in the suburb. Farming is done by both the employed and unemployed. Those who are employed said their salaries and wages were not enough to cover monthly expenses. Transport costs to and from work, increasing food prices, rates and electricity charges forced them to start farming to feed their families. Several respondents stated that they first thought it embarrassing to do farming in the city. However this perception has long been surpassed by practical needs. Present economic conditions have forced all residents to cultivate for the survival of their families.

REASONS FOR FARMING

- “Food commodities are now expensive”
- “My salary is not enough for the family’s monthly food expenses”

- “I was retrenched and the only way to survive is through farming”
- “ I prefer fresh vegetables from our garden”
- “I sell the crops to pay for my children’s school fees”

10.6.4 Forms of urban agriculture in Dangamvura

Urban agriculture in Dangamvura exists either as on-plot or off- plot cultivation and includes the following forms:

- Vegetable growing in back and front yards
- Crop cultivation at roadsides and along Sakubva and Nyamauru rivers
- Cultivation in open public spaces
- Cultivation near the rural areas of Dora
- Poultry and other small livestock rearing
- Vegetable and crop marketing

10.6.5 On-plot cultivation

On-plot cultivation includes all agricultural activities that occur inside the formal boundaries of the residential stands. Most of the houses are fenced and this makes it ideal for crop cultivation and poultry. A transect walk across Dangamvura revealed vegetable gardens to be common. Some homes also cultivated flowers and grass lawns for ornamental purposes, but this was the exception rather than the rule. The sizes of vegetable gardens vary from one household to another. Beds measured averaged 1-2m wide and 4-8m long. The size of bed varied directly with the size of plot. Houses located at corners normally have bigger yards; hence, bigger gardens. Houses that were extended had smaller spaces left for vegetable gardens since all the space was built up.

10.6.5.1 Vegetables

Crops grown are tomatoes, cabbages, *covo* (rape) and onions. Residents said that crops were for family consumption but that surpluses were sold in the neighbourhood. Most people claimed they preferred fresh vegetables from their gardens rather than buying those in the supermarket. Others stated that shop vegetables were too expensive and they could not afford to buy them daily. In general, respondents claimed that the supply of vegetables from their gardens was enough for the whole year.

10.6.5.2 Flowers

People grow flowers in their front yards and backyards for ornamental purposes. They do this during their spare time. Some grow flowers in pots and tins for sale in the neighbourhood with women mainly involved in flower growing for pleasure and sale. Interviewed women growing small pot-plants and flowers for market were either unwilling or unable (due to claimed lack of accounting) to reveal the costs of this activity.

10.6.5.3 Poultry

Chickens were being reared mainly for the market. Very few said that they kept chickens for family consumption. Poultry is kept in shacks built on-plot. The number of birds kept varied from house to house. Some had up to 200 birds. Those with few birds claimed that the price of chicks and feed were limiting factors. Other limiting factors were diseases and the prices of chemicals. Some respondents said that they used the maize from their fields as poultry feed. Most of those who kept poultry were making a profitable business especially during festive seasons, with the price of one live chicken ranging between \$Z 200 and \$Z 500 (at the time of the research: USD 1.50-2.50).

10.6.5.4 Group vegetables gardens

Some vegetable gardens belonged to groups and institutions. We had an opportunity to go to Mutare Bible School where gardening is being done. The Principal, Mr. Gwazaza, said that the school had students on partial scholarships and these were not enough to cover the cost of food for the whole year. Students therefore grew their own vegetables for consumption at school. The Principal said it was part of their studies to do agriculture. At one church the members were encouraged to come and grow crops in churchyard for their families.

10.6.5.5 On-plot water use

In most back yards, residents irrigate using tap water. Some households have hosepipes while others use buckets to irrigate the crops. Several respondents noted an increased tendency to use grey water for irrigation because of the high cost of in-house water supplies. Several respondents denied the use of grey water to irrigate their crops, clearly expressing dismay at the thought of using 'used' water. Asked whether they use wastewater, most residents said they did not use it because they grew leaf vegetables and it was unhealthy because it was not treated.

On-plot irrigation is done mostly in the dry season. Those interviewed said irrigation is done two to three times a week. The major limitation to irrigation was water charges. According to respondents, the City of Mutare was increasing the rates 'time and again' up to the extent that some are no longer able to pay for it. Some respondents said that the council was at times stopping supply due to non-payment by the poor residents. One respondent showed us a water bill for that month which was \$Z 500 and he expressed concern that it was too much for the family.

Disconnection of supply for non-payment by the City of Mutare results in high incidences of vandalism of council property as residents access water illegally. This was a major blow to agricultural activities in the township. While on-plot cultivation has never been a problem to the city authorities and the residents, vandalism of water supplies continues to set City Council against residents and inhibit the development of sustainable solutions to urban agriculture.

10.6.6 Off-plot cultivation

Off-plot cultivation is that which has resulted in clashes between the City of Mutare and residents of Dangamvura. Cultivation is done in open spaces all over the suburb.

AREAS WHERE THERE IS OFF-PLOT CULTIVATION

- Along Nyamauru stream and Sakubva river
- Open spaces near the Gimboki Graveyard
- Maize fields at quarry.
- Areas around the sewage works
- Swampy and areas unfit for housing construction near Beta supermarket.
- Any vacant land or land gazetted for another use but secured through common agreement with local chiefs.

Off-plot cultivation includes maize, sweet potatoes, beans, sugar cane and groundnuts. Most fields rely primarily on rainfall and are not irrigated. The size of the plots varies from place to place and some measure up to a hectare while others are just a few square metres. Some fields near Sakubva River use water from the river to irrigate their crops but the water shows visible signs of contamination.

Maize is consumed as green mealies together with sweet potatoes as a substitute for bread. The remainder is dried and ground into mealie meal for “sadza”, the staple food. Sadza is consumed twice a day, at lunch and supper. This is consumed with mostly vegetables from the gardens and at times meat from the supermarket or family production.

Many families no longer buy mealie meal from the shops because they are producing it from their fields. This has resulted in the emergence of hammer mills in Dangamvura. At present there are now five hammer mills that are evenly spread in the township. One operator stated that business was brisk from local residents producing from their fields.

Off-plot cultivation has been received with suspicion by the city of Mutare. City Council used to send its Municipal police to slash down the green mealies on the pretext of protecting the environment. Recently all maize crops in the fields along Nyamauru stream were slashed as a way of punishing residents for cultivating in the riverbanks (**Manica Post**, 24/01/2001). The issue of the environment is a serious cause of concern, which needs to be addressed. Some of the areas used as maize fields show signs of erosion and are clearly vulnerable to environmental degradation. At the time of the study, many streambanks had been burned in preparation for planting.

At present, City Council is showing leniency given the very dire economic situation in Zimbabwe. Some residents claimed the motivation was purely political, as elections were then on the horizon.

10.6.6.1 Peri-urban agriculture

Unutilized open land is increasingly in short supply in Dangamvura. This is due to the combination of urban growth and comprehensive cultivation of any open land. The shortage of land to cultivate in Dangamvura has resulted in residents travelling to the area near Dora Rural District in search of land. Some are actually going into the rural areas to grow crops. Some residents walk distances of more than 8 km to their fields. Here maize is the main crop grown and this is done mainly during the rainy season. They get the land through informal arrangements with people from these areas. Thus, crop fields are being pushed further and further to the borders with the rural areas, thus confirming Abu-Lugho's observation regarding the increasing incidence of the 'rural in the urban and the urban in the rural' (pers. comm., March 2002).

10.6.6.2 Securing off-plot urban fields

Securing an off-plot field as one of several thousand urban dwellers is not an easy task. Land to grow crops is limited in Dangamvura and one has to do all things necessary to make sure you have somewhere to cultivate. The City of Mutare has no land set aside for urban cultivation. Some respondents said that they got land from the City Council but later the area was developed into a shopping centre and residential stands. Most of the people who have land have been in Dangamvura for many years and acquired large plots of land much earlier when more was available. Some respondents said they rent fields from their friends and neighbours. Some said they paid about \$Z 500.00 per season for a small plot.

The majority of the residents used open spaces that were close to their houses. From the informal discussions with key informants, it was clear that everyone respects the informal arrangements on land. Where these arrangements are violated, 'strange fates' are said to befall transgressors. There is therefore tradition and superstition used in the management of this resource. Land that has been visited by a traditional healer is secure from infringement by others. In general, open land is used by local residents. In no case did we encounter a case where a person living in one section of Dangamvura cultivated a plot in another section.

Land is the major constraint for the urban farmers and there seems to be no solution in sight. People tend to sub-divide their little portions using stone boundaries and old junkyard material. There are no guidelines on how to get the land for cultivation. The majority of the residents said that they did not know who to ask for land since the Council was no longer giving land. A number of respondents claimed to prefer land adjacent to their plots as they could manage it better, for example making sure it was free from snakes and other predators. Residents also claimed to be putting gazetted rubbish dumps to good use as City Council was no longer regularly attending to these areas. These seemed mere justifications for activities they clearly regarded as illegal but necessary.

10.6.6.3 Off-plot use of water

Off-plot cultivation, especially that undertaken in peri-urban areas, is primarily seasonal and rainfed. High water costs make uneconomical larger off-plot water use of treated in-house water. Streambank cultivation encourages use of the water from

Sakubva River and Nyamauru stream, although the quality of this water is suspect especially during the dry season. Upstream dye factories and pulp mills are said to be putting a great deal of effluent into the river. Presently there is a University of Zimbabwe study on-going trying to measure pollution levels in the rivers and streams downstream from these factories. Nyamauru stream is a seasonal stream and most of the year there will be nothing except dirty stagnant pools that cannot be used to irrigate gardens. Most residents expressed willingness to use partially treated wastewater if the council could treat it and if it could be made available at a lower rate than the current tap water.

10.6.7 Use of agro-chemicals

Chemical and organic fertilisers are applied on gardens and fields during the growing season. Most respondents said they used chemical fertilisers in the gardens on a limited scale. They apply Ammonium Nitrate (AN) and Compound D at least once in the growing season in the off-plot fields. Very few used it on the vegetable gardens because they believe that the use of fertilisers in the vegetables makes them taste bad. They prefer to use organic manure that they buy from people coming from the rural areas of Dora. They buy 20 kg bag of manure at \$Z 20.00. Manure is also available free from the municipal sewage treatment works.

Pesticides are widely used in the vegetable gardens to control aphids and others pests. The pesticides are bought from the nearby supermarkets. The most commonly used was *Rogor* to kill aphids and other pests. Pesticides are used in the storage of maize. Maize harvested is the family's supply for the whole year. These pesticides are used to protect the harvested grain from weevils.

10.6.8 Street vending

Marketing of the vegetables and crops is in the form of street vending. There are both licensed and unlicensed vendors, with the latter forming the majority group. The most common type of crops sold are tomatoes, *covo*, cabbages, and onions – taken together, these constitute a basic 'relish' eaten with sadza. Women and children are a majority of the vendors. A bundle of *covo* with 5 leaves is sold at \$Z 5.00, one onion for \$Z 2.00 and a pack of 4 tomatoes for \$Z 10.00. Other vendors sell roasted maize cobs during the rainy season. Children sometimes are sent to move from house to house, selling vegetables. Women contacted said that they pay for rates, water, electricity bills and rent from the income they get from vegetable selling. When vendors were asked the amount of money they were getting from selling vegetables many said that they do not keep accounting records of their enterprises. Some said they net up to amounts between \$Z 300.00 and \$Z 500.00 on a good day of business. Others use the money to pay for the bus fares of their children who attend school in town. Street vending has managed to increase the household incomes and created opportunities for the majority in Dangamvura.

10.6.9 Health and environment

Maize, sugar cane, and vegetables like *covo* and tomato are being grown along the banks of Sakubva River and Nyamauru stream. Maize fields contravene the prohibited 30-metre distance from the river without any form of protection on the soil. Some of

the farmers along the banks of Sakubva River noted access to water as the main reason for cultivating along the stream bank. Officials from the department of natural resources sometimes warn them not to use these areas for cultivation purposes. Soil erosion is an issue of concern and needs to be addressed. People clearing land for crop fields have cleared most of the indigenous trees. The water in Sakubva River and Nyamauru stream shows some signs of contamination from the use of fertilisers, sewage seepages, and pollution upstream. There are also signs of eutrophication from the use of chemical fertilisers and sewage upstream. The residents highlighted the increase in the incidence of malaria during the rainy seasons due to untidiness from maize crops that are breeding grounds for mosquitoes. There were also cases of people who steal pesticide-treated vegetables and sell them on the street markets. This causes major health upsets to the residents. Many residents expressed concern regarding the unhygienic conditions of the vending area and the food they sell.

10.6.10 Extension Services: AGRITEX

The Ministry of Agriculture through the Department of Agricultural Extension Services (AGRITEX) offers free services to urban farmers in Dangamvura. From the interview with AGRITEX's urban extension officer, it became clear that most residents do not know that there are such free services. The officer is responsible for offering free advice on all aspects of farming and environmental protection. AGRITEX offers training to urban farmers and help in setting viable agricultural projects. Workshops and training sessions are held twice a month with different commodity groups. The commodity groups are gardening, poultry and rabbit keeping and youth clubs. The workshops are well attended by women. According to the officer, youth groups are difficult to deal with because they are mobile, looking for other employment opportunities. Most of the youth want immediate financial returns, and are unwilling to put in the necessary time to learn from AGRITEX. AGRITEX liaises with the City of Mutare, the Natural Resources Board and all concerned parties for the sustainability of urban agriculture.

10.7 The City of Mutare

The City of Mutare does not have any land designated for urban agriculture, choosing instead to send its police to slash the maize crops. At present, however, and perhaps only due to dire circumstances, City Council seems to recognise the importance of urban farming. Indeed, recently a farm was acquired by the Council to be used for group farming – a common enough sight elsewhere in the world. However, residents are complaining about the money they are required to pay for the use of this gazetted land.

The Council also allows people to use treated waste from its sewage treatment works as manure. On-plot cultivation has never been a problem to City Council, although small scale irrigation done with water secured through vandalism is acknowledged to be widespread and difficult to police. The major clashes occur with respect to off-plot cultivation, with soil erosion and health issues being commonly related Council concerns. By-laws do not specifically prohibit urban agriculture; rather, it restricts it to designated, on-plot, areas. Off-plot urban agriculture is now being discussed at higher levels in the country and also being accepted in other cities. This may be the reason for the city authorities' compromises.

10.8 Gender and Urban Agriculture

Men and women play important roles in urban agriculture throughout the world by producing, processing, marketing and providing food for the family (www.fao.org/Gender). It is therefore imperative to situate any consideration of urban agriculture within a wider framework of gender division of labour with regards to the tasks and the distribution of benefits within a household (Rakodi, 1988).

10.8.1 Women and food security

Women are responsible for generating food security for the family in many developing countries. They are estimated to account for 60-80% of urban and rural subsistence food production in Africa (Quisumbing et al, 1995). The growth of urban populations and the deteriorating economic situation in most developing countries poses unique challenges to women hoping to feed their families. In Zimbabwe, women have borne a disproportionate amount of the burden due to economic decline. This has had an adverse impact on their status as home managers, mothers and community organisers. Urban women end up practicing urban agriculture as a form of supplementing household food supply. According to Hasna (1998) urban agriculture is the livelihood strategy used by most women in developing countries as a source of income, food and employment.

The sustainable participation of men in urban agriculture is doubtful because they tend to participate as contract labourers or on part-time basis as helpers to their spouses. In studies carried out in Harare, the majority of those who assist are children with very exceptional cases of men (Mbiba, 1995). Some men do urban farming as a hobby at weekend and after work. They can afford their food requirements but they still prefer to do farming because of the enjoyment they derive from urban agriculture. Where men are fully involved in urban agriculture they tend to specialise in more commercial and mechanical enterprises. Ratta (1993) cited an example of the squatter settlement of Mont Ngafulla in Kinshasa where community members started a farming project. Men manage income-generating activities and women manage vegetable production for home consumption. Mbiba (1999) cites increasing levels of male involvement in urban agriculture in Zimbabwe because of loss of formal employment. According to him, male perceptions and attitudes towards urban agriculture are changing and becoming more favourable and there is a danger that women might be displaced from an activity they have engaged in for many years.

For Hasna (1998), the existence of many women in urban agriculture is an indication of limited opportunities for them outside the home. Women tend to be marginalized in other forms of employment in formal sectors of the urban economy. Some attribute this to a lack of education and training opportunities. Many recognise these deficiencies as gendered and structural in nature. Urban agriculture, therefore, becomes a possible and viable source of income, employment, household security and female empowerment (Ratta, 1993).

10.8.2 Evidence from Dangamvura

Women dominate all aspects of urban farming in Dangamvura. They are involved in on-plot and off-plot cultivation. Women constitute the majority in poultry rearing and street vending. Women do most of the cultivation, irrigation, planting and harvesting. From focus group discussions conducted with women in Dangamvura, it became clear that the vast majority of them are involved in urban agriculture on a full time basis, working virtually single-handedly, although they get occasional help from their children and spouses who come to the fields during weekends and after work. Urban farming for the husbands remains a form of leisure and time to relax when not at work. One man stated: *“Kurima ibasa remadzimai”* (Farming is a woman’s job). Another said: *“I buy the seed and fertilisers and that is my cultivation”*. Reasons given for practicing urban agriculture by women are generally economic. The following are representative of the kinds of answers we received from women to the question ‘Why do you practice urban agriculture?’:

- *“I grew up in the rural area where we did farming so I have to continue farming”.*
- *“I am not employed and the only way to feed my family is growing crops”.*
- *“My husband’s salary is not enough for the family food requirements”.*
- *“ Food commodities are very expensive here”.*
- *“My husband who was the bread winner was retrenched so I cannot sit and watch my family dying of hunger.”*

Women make decisions on what to plant and what to sell but in most cases they need to consult their husbands because of the need to purchase seeds, fertilisers and agro-chemicals. Women are responsible for deciding what the family should consume and what to sell on the market, although one man boasted: *“All the produce is mine because I buy the seeds and fertilisers”*.

The land used for crop cultivation belongs to the City of Mutare. In Zimbabwe, women generally have no security of tenure. Yet, several female respondents said that they were not concerned about owning the land but wanted somewhere to plant their crops. Many stated worries about the lack of a clear policy on urban farming.

10.8.3 The Need for Policy Change

The participation of women can be enhanced if they are given the necessary support through gender sensitive policy measures. For effective policy changes the following questions and issues need to be addressed:

- What are the priority problems identified by men and women?
- What are the problems identified by different age groups based on age and ethnicity?

- How are people coping and what is the gender implication of the current household food security strategy?
- How will proposed solutions/approaches change the gender dynamics?
- How will women's lack of access to resources be resolved?

At the same time, research into urban agriculture must take the following three steps:

- Emphasise gender research in urban agriculture
- Identify the importance of women in city farming
- Consult women in decision making

10.9 Observations and Policy Recommendations

Urban agriculture is used primarily for subsistence food production. It also improves household food security and family real income. Thus urban agriculture saves money on food expenditure and requirements that is then used to buy other goods. Current urban planning, bylaws and concepts regard urban agriculture as an inappropriate urban land use and farming is discouraged. However, our study proposes the following nine recommendations for urban farming to be viable in urban centres. As with the previous case study of water supply and sanitation, a demonstrated lack of political will mitigates against these policies being implemented.

- **Legalization and Recognition of Urban Agriculture**

Informal urban farming should be recognised as an important part of urban and peri-urban socio-economic activity. All unsubstantiated legal and policy restrictions must be removed.

Farmers must be allowed to grow crops and keep livestock in designated areas. This entails a revision and relaxation of urban bylaws to enable sustainable urban farming.

- **Develop Guidelines on How Urban Agriculture Should Occur**

Urban agriculture is viewed as having negative health and environmental impacts. If the authorities remove legal restrictions they should however set flexible guidelines which residents should follow. The authorities are responsible for setting up zones where urban agriculture should be carried out and also the crops that should be grown. This will minimise the negative health and environmental impacts that have been for so long used as an excuse to stop urban farming.

- **Set aside land for urban agriculture**

Urban agriculture normally exists as an unplanned activity in many cities especially in developing countries. Authorities do not set aside land for agricultural activities. It is important for city authorities to include informal farming in the demarcation of land use zones. This entails the revision of the zoning bylaws and indication of zones where urban agriculture may be carried out and those where it is not allowed due to special reasons such as vulnerability to land degradation. Urban agriculture also should be used as a temporary utilisation of vacant public and undeveloped land. The availability of land should be supported by a reasonable form of non-gender specific

land tenure and user rights – say, something in the order of 5 year leases at affordable costs.

- **Access to Water**

Water is probably the second most important resource after land in urban agriculture. Most of the off-plot cultivation is rainfed and seasonal. Those who are fortunate enough to have water for irrigation complain about the high water charges. In most areas farming all year round would be possible if water was available. City authorities should establish water points in the off-plot fields for irrigation. This can be made possible by sinking boreholes and recycling wastewater. In the absence of such water points, illegal connections and vandalism will continue.

- **Promote Utilisation of Wastewater and Organic Waste**

The utilisation of organic waste and wastewater for urban agriculture proved to be very important in some cities. This has multiple benefits to the city and residents. Organic wastes can be collected and decomposed for use in agriculture as fertilisers. Wastewater can be recycled to provide cheap and unlimited water for irrigation. However, efforts should be made to make sure that the treatment conforms to acceptable global standards to avoid health and environmental hazards.

- **Provision of Extension Services and Information**

Extension services should be provided to urban farmers. This will help them to implement proper farming methods and also choose the right crops to grow. City authorities, along with the Ministry of Agriculture, should provide information jointly. Information about marketing should also be available to farmers for them to improve from subsistence farmers to commercially oriented farming.

- **Access to Inputs and Farming Implements**

Urban farmers lack access to inputs and farming implements. Efforts should be made to make sure that retail outlets and distribution networks of seeds, fertilisers and implements are put in place. The authorities can start input facilitating schemes to help farmers. This has proved to work with other government departments operating in rural areas.

- **Access to finance**

Farmers lack adequate finance to purchase inputs. This has been attributed to lack of tenure rights on land that could otherwise act as collateral security for securing loans from financial institutions. City authorities together with the government should help farmers to obtain credit from financial institutions. Residents should be organised to form community banks and savings clubs. This collective approach will help alleviate individual and individually shared financial problems.

- **Gender Consideration in Policy**

The role of gender in urban farming cannot be over-emphasised. Women must be included at policy level. At the same time, more effort should be expended at all levels of government to ensure that the needs of all women are addressed.

CHAPTER 11:

GENERAL CONCLUSIONS

11.1 Introduction

This project has focused on the place of water in the theory and practice of ‘security’. It has argued strongly for new approaches to thinking about water resources management in the Southern African region. Specifically, it has argued that locating thinking and future planning about water resources within the ambit of the self-regarding state is deeply problematic, particularly when the dominant framework used is ‘national security’. In a region with an abundance of shared water resources, this is a recipe for trouble.

At the same time, we recognize that states are the dominant social forms in the region and the only likely locus in the short term for globally recognized laws and other enforcement mechanisms. We are therefore forced to work with states, not against them.

11.2 New Thinking

To this end, this project has presented a number of novel ways of thinking about water resources management – what we would like to think of as constructive interventions that help move the regional dialogue away from its current fascination with ‘water wars’, ‘ingenuity gaps’, ‘over-population’ and other such ungrounded truth claims and power-masking ‘facts’.

We have argued, for instance, in favour of a discourse which uses the **river basin** as the fundamental unit for integrated resources management – not just water. We have also argued in favour of thinking about environmental issues in terms of **ecosystem sustainability** as opposed to environmental security. We have argued for placing **human security** at the center of our thinking, not state security. We have highlighted the importance of thinking locally, acting regionally – that is, in pursuing **transnational solutions** to issues that defy state boundaries. We have highlighted the importance of language in the framing of issues and challenges: in this project we have taken a deliberately optimistic stance on possibilities for sustainable water resources management – a position we think is supported by the evidence put forward in the case studies. In our opinion, words matter: you should choose yours carefully.

11.3 Critique as Method

In terms of technique and method, we have argued strongly for a constructivist approach which employs critique and reflexivity. In practice this means rereading history, unpacking accepted ‘wisdoms’, questioning dominant episteme-methodologies and ontologies, asking difficult questions, and approaching ‘old’ issues in highly unconventional ways. It also means recognizing that we, as ‘experts’, do not have a monopoly on knowledge. We should approach our topics humbly and be willing to accept the uncomfortable truth that we may in fact be wrong. We must, as we have

said above, acknowledge that knowledge is power, and that as such water resources management is much more than simply getting the institutions or the science ‘right’.

11.4 Working Hypotheses

Our case studies have generally borne out the first two of our three main working hypotheses:

- Resource scarcity is, in the first instance, more likely to lead to cooperation before it will lead to conflict.

Despite incredibly difficult circumstances throughout the research area, be it on the commercial farms, in the communal areas, in Sakubva or Dangamvura, we found very few instances of unresolvable conflict over water resources. As highlighted in the first case study above, even where fast track resettlement and land invasion had upset the apple-cart of decision making, members of the Save Catchment Council acted in a very practical and determined way to accommodate these changes.

Moreover, in the cases of water supply and sanitation in Sakubva and urban agriculture in Dangamvura, the evidence provided suggests that conflicts there are, as predicted by Homer-Dixon and colleagues, likely to remain diffuse, protracted and sub-national. They are by and large non-violent as well.

At the same time, City Council is actively seeking ways to address the various grievances people have around water and land use.

Lastly, the Pungwe-Mutare water project is, itself, testimony to collective decision making taken in the wake of a very difficult situation – the drought of 1990-2 where the city basically ran out of water. Whether we feel the Pungwe project was the right project is subject to further investigation. The point to be made here, however, is that severe drought led to collective cooperative action, not conflict.

- Changes in information and the way that information is framed can change the strategic climate for decision-making; so, framing issues in terms of securing, say, ‘South Africa’s water’ encourages exclusion and privileges confrontation, whereas securing ‘regional water supplies through integrated water resources management’ encourages inclusion and privileges cooperation.

Assisting in this effort, it seems to us, is the general direction of the discourse about water resources management in the region. Unlike certain global trends which seem fixated on ‘water wars’, ‘environmental conflict’ and ‘looming scarcities’, regional policy makers are actively addressing these issues in the context of integrated water resources and river basin management. Clearly, progress is fitful. But, as highlighted above, there are numerous international activities under way which suggest that state-makers think positively and act cooperatively, rather than negatively and exclusively.

- Post-Westphalian forms of governance which emerge around specific issues can be institutionalised and lead toward broader forms of cooperation at sub-, inter-, and trans-national levels.

This hypothesis has, however, not been confirmed by observable practice. While the cooperative behaviour demonstrated by members of the Save Catchment and Odzi and Pungwe Sub-Catchment Councils suggest that it may be possible for subsidiarity principles to envelope and empower communities, resource use decisions remain overwhelmingly top-down and state-centred. At the same time, evidence there also suggests that we should not ignore the wide variety of power dynamics – from the structural to the personal – that manifest themselves in these ‘issue oriented’ forums. Cooperation for wider social benefit, however that social form is defined or at whatever level it is undertaken, is never easily achieved, let alone institutionalized. Thus, the third hypothesis remains more of a hope or a feeling than a demonstrated reality.

11.5 Observations and recommendations

Numerous conclusions, observations and recommendations emerged out of the case studies and these have been articulated above so will not be restated here. Perhaps by way of conclusion, however, we might make the following recommendations.

With regard to institutional reform:

1. Catchment councils remain a good idea and should not be discredited because of early setbacks.
2. Participation on these councils, however, overwhelmingly reflects the dominant interests and ways of thinking in society. They should, like any other institution, be regarded not as a panacea but as a possible improvement on past practice. Checks and balances should be put in place to ensure the broadest base of stakeholder participation.
3. Governments, in the context of debt and political instability remain very unwilling to devolve real power to these new institutions. Those interested in seeing IWRM really work, must acknowledge the presence of this difficult fact.
4. Donors have their own visions of these institutions and too often impose their ideas/ideals upon ‘recipients’. Space must be made for these river basin organizations to develop organically. Templates should be resisted at all costs, no matter how attractive they appear to be or cost effective they are.
5. Perhaps the most important activity that must continue is research – both the collection of hard data regarding the natural resources base, and social scientific investigation into a wide variety of areas: e.g. stakeholder use patterns; consumer willingness to pay for resource developments; the dynamics of intra- and inter-institutional decision-making; the ways in which specific resource ‘sectors’ are integrated into and affected by wider social, economic and political factors, forces and actors. The list is virtually endless.

With regard to water and sanitation in urban/peri-urban areas:

1. While it is a good thing that the World Summit on Sustainable Development chose to focus on water supply and sanitation issues, the predilection for cost-recovery mechanisms in poor places will no doubt fail.

2. Assured access to potable water does not equal 'human security'. Poverty, food insecurity, health risks, among other things may undermine the best efforts to provide equity, sustainability and efficiency in water supply.
3. Blend prices and state cross-subsidies, therefore, must continue if poor people are to have access to water resources and sanitation.
4. In situations where there are vast disparities in wealth in a shared urban space, as is the case with Mutare/Sakubva, and where a tradition of militancy has been developed by people in the high density suburbs, it will take great creative energy to find the proper forum and language through which to solve what are virtually intractable problems.
5. Community participation of resource management at all levels of decision making (including involving local people on the City Council) is essential.
6. Training programmes (e.g. for self-employment programmes like pipe repair), too, are essential if local people are to be made partners in the management of their own resource base.
7. The active involvement of youth, women and (I)NGOs in the management of the community, particularly in the common block areas where resource use most closely resembles open access, is also a viable policy option.

With regard to urban agriculture:

1. Rapid urbanization is unavoidable, as current trends throughout the developing world show no signs of abatement. In a context of a down-sizing state, it is unreasonable to think that people will adhere to what are largely Western/Northern models of urban planning.
2. As a result, creative ways and means must be sought to make the best of the reality of urban agriculture: it is a realistic, viable and sustainable means for household security and should be embraced.
3. Zimbabwe's current turn toward recognition and legalization of urban agriculture is an important starting point.
4. Guidelines should be developed regarding how and where urban agriculture is to be facilitated. A great deal of work in this area has been conducted in the Asian world and a variety of state and non-state actors could be approached for advice and assistance.
5. Land should be regazetted to maximize off-plot cultivation
6. Water points for off-plot cultivation should be developed, otherwise illegal connections and vandalized water points will proliferate
7. Wastewater and organic waste use should be promoted
8. Agricultural extension services and other inputs traditionally reserved for the rural areas should be made available to urban farmers
9. Access to credit and finance should also be made available
10. Given the central role played by women in water resources management and urban agriculture, policy must put gender issues front and center if it is to be sustainable.

In general:

1. How conflicts manifest and are resolved differ across political cultures. African traditions of consensual and patrimonial political practice help

- facilitate collective decision making at elite level but create particular barriers to participation – beyond simple acquiescence – below that level.
2. History forms an important back drop. Not only the history of state-making and maintaining, but a variety of other narratives and foci as well: liberation struggles; sub-national struggles for land rights; migration; wealth-creation. All of these help frame the context of and possibilities for sustainable water ‘sector’ management.
 3. It is a mistake to consider national, sub-national, intra-basin but international case studies outside of broader regional and global contexts. Regional protocols, institutional forms, policy frameworks, global trends, IGO and NGO activities, donor state policy frameworks all have a meaningful impact on ‘local’ issues.
 4. Aggregate data can be misleading. Population dynamics, ‘water stress’ measures and human development index indicators are all subjective representations of select ‘facts’. As such, they can be manipulated to tell a wide variety of sometimes contradictory stories.
 5. Different analytical frameworks yield new insights. Shifting the focus from states to ecosystems, or river basins, or from state-security to human-security and/or gender inequality, shifts our understanding of the place of water in social and biological systems. It is therefore important to revisit our analytical frameworks/theories and interrogate underlying assumptions.
 6. A variety of social forms and institutions are necessary for the successful management of water resources. Communities, international (non)governmental organisations, urban/rural organisations, states and (international) laws, to name several, all must be made partners in a clearly articulated project.
 7. Outcomes are not necessarily what they seem. Too often, donor projects pre-explain ‘failure’ via, for example, ‘limited human resource capacity’. Yet, ‘failure’ at donor level may in fact equal ‘success’ for powerful local social forces intent on maintaining the status quo.
 8. Given that there are likely to be numerous unintended consequences of policy and project implementation, projects must be flexible. What must remain inflexible, however, is the answer to the question: Who is the intended beneficiary of this project?

11.6 Concluding Remarks

11.6.1 Water Wars?

In this project we have identified a wide variety of uses of and inequalities of access to the natural resources of the Southern African region, the Zimbabwe and Mozambican states, and the Pungwe and Save River basins. We have also highlighted various conflicts (intra-urban, intra- and inter-sector) but also a good number of cooperative activities. We have argued that the region demonstrates a historical pattern of inter-state cooperation, and that many international actors contribute to this climate of cooperation (but also contribute toward conflict as well). Even in the case of a land revolution in Zimbabwe, this process has been remarkably peaceful especially when placed in global historical context. While there is great wealth in the region, the vast majority of the people resident there are poor.

As Bernard Brodie observed, in the modern era ‘the predisposing factors to military aggression are full bellies, not empty ones’. The poor and wretched of the earth may be able to deny an outside aggressor an easy conquest, but they are themselves a minimal threat to outside states. (Deudney in Conca and Dabelko, 1998: 312)

Try as they might, those who are convinced of the ‘water wars’ hypothesis are hard-pressed to find evidence that would support such thinking. This fact has, in our estimation, led many of the early doomsayers away from retrogressive geopolitical frameworks toward more progressive forms of analysis. ‘Water’ is increasingly located where, in our estimation, it belongs: in discourses of human security, ecosystem sustainability, health and development. Clearly, the arguments will continue but they will be set within more supportive frameworks and constructive languages. In the Southern African context, for example, the annual meeting of Warfsa/WATERNET, now into its fourth year, is testimony in this regard.

11.6.2 Security?

In terms of security, it is clear that some have it and some do not. While this project has been centrally concerned with enhancing human security, including equitable access to water resources, it reveals the many contradictions embedded in the term ‘security’. For example, a ‘secure’ water supply for the City of Mutare creates special insecurities for the poorer residents there. It may also lead to the build up of animosity between the City and other user groups within the river basin. Institutions designed to enhance national water security lead, instead, to a deepening of extant unequal social relations. In the context of wider societal insecurity – as exists in both Zimbabwe and Mozambique – it is perhaps understandable how reforms result in resource capture by those already empowered and further economic marginalisation of the poor. No amount of free fresh water will lessen the inequalities between those in the state house and those in Sakubva. To be sure, access to copious amounts of freshwater in the HDS around Mutare does assist in household security, particularly in the increasingly common practices of urban agriculture and water-dependent informal sector manufacture (of, for example, tombstones, cinder blocks, bricks). But these activities themselves are testimony to the heightened levels of insecurity felt by the poor in Zimbabwe (see Gogwana, 2002; Makwanise, 2002).

11.6.3 Water Resources Management as Symptom

This leads us to our last point. In terms of analytical and/or theoretical frameworks, river basin security – which lies quite comfortably with both IWRM and IRBM – is compelling. It encourages us to consider using resources within their natural system, an idea that stretches back to Aldo Leopold’s notion of a biotic community. It also counsels subsidiarity: that those closest to the resource will take decisions regarding its use, so implying a wide variety of social goods: sustainability, equity, efficiency, good governance and the like. These are very seductive assumptions. But we would do well to listen to Newson (2000: 211):

The ‘river basin ideal’ spans many centuries, from the pre-historic civilizations of, e.g., the Nile, the Indus and the Tigris/Euphrates. It is tempting to idealize the coordination and sustainability of resource use

inherent in these units... In the modern world, notably in the twentieth-century, basin-scale river management (and land development) through river basin institutions has become popular beyond its proven record of success... [I]t must be admitted that the model has faced arduous circumstances with its unmodified application to drylands (the focus of the current 'water crisis') and to the many basins shared by more than one nation state.

As we have seen above, the attempt to operationalise river basin management through Catchment Councils has faced many socio-political obstacles. Nevertheless, in our estimation, river basin analysis adds sophistication to our thinking about the ways in which society, economy, polity and ecosystems interact within a specific geographical setting. In something of a paradox, however, this attempt at analytical integration within a delimited geographical space masks the fact that water, natural resources, and the basin itself are fragmented elements within greater regional and global circuits of power. Water resource use is a manifestation of and is embedded within a complex series of sub-national, national, regional and global power relations. These relations interact in various ways with only one of many results being *inequity*, *inefficiency*, and *unsustainability* of water resources management. It is therefore no accident that the anti-globalisation campaign has latched onto water resources management as a flagship issue, for inequalities of access are symptoms of both local and global causes (Bond, 2002).

Security and insecurity are manifest at different levels in different ways. Thus, while a necessary component of river basin security involves working toward an understanding of how resources are used, and how different systems overlap and interact, this can only be a partial solution. The basin itself must be located within a wider theoretical framework – one that critically interrogates the political economy of development and underdevelopment in a simultaneously globalising and fragmenting world (Mittelman, 1997; Hettne, 1995). A critical perspective grounded in social theory may not immediately lead us to clear policy options. It does, however, help us toward, for example, a better understanding of the relations between water resources management, the land crisis in Zimbabwe, and regional and international responses. In other words, it helps reveal the social relations of power – a difficult but unavoidable step if we are seriously concerned with improving human security.

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APPENDIX 1:

DETAILS OF FIELDWORK INCLUDING RECRUITMENT OF STUDENTS

1.0 Scoping Exercises

The project principals – Van der Zaag, Thompson, Swatuk – undertook three separate scoping exercises in July 2000, September-October 2000, and in June-July 2001. The last of these also included the field work portion of student participation.

1.1 23-27 July 2000: Upper Pungwe River Catchment/City of Mutare

The initial scoping exercise was carried out over the Zimbabwe/upstream portion of the Pungwe River, including the areas surrounding the off-take pipeline, and the City of Mutare including its high density suburb of Sakubva. Intensive interviews were held with a large number of people there.

City of Mutare

- Engineer Nyatoti, Chief Engineer, Department of Works
- Engineer Marunga, Water Engineer, Dept. of Works
- Dr. D. Maclean, Director, Health Department
- Mr. Chirau, Environmental Health Officer, Sakubva Clinic

Dept. of Water Development, Manicaland Province

- Eng. T. Murinye, Provincial Water Engineer and Save Catchment Manager
- Eng. G. Pazvakavambwa, Water Engineer
- Eng. E. Nhidza, Water Engineer

Agritex

- Mr. Sithole, Chief Provincial Extension Officer, Manicaland
- Mr. T Gondo, Extension Officer, Mutasa North
- Mr. Samson, Extension Officer, Mutasa North

Mtarazi Irrigation Scheme

- Mr. C Nbava, Chairperson

Africa University

- Prof. Tagwira

This scoping exercise helped project principals gain perspective on the kinds of water-resource related issues that were important to this part of the Basin. Site visits were also conducted to the Pungwe Water Scheme off-take point and to the Rhodes-Nyanga National Park which lies in the upper-catchment of the Pungwe River.

1.2 27 September – 4 October 2000: Lower Catchment/Mozambique/City of Beira

As part of our scoping exercise, the project principals (Van der Zaag, Thompson, Swatuk) visited various sites, people and organisations in Beira. In the main, it was our intention to (I) get a feeling for the kinds of issues and concerns revolving around water scarcity, plenty, and provision particularly in Beira but also among all stakeholders in the Pungwe River Basin (e.g. large and small scale agriculture, industry, national parks) and (II) to identify partner institutions or individuals with whom we might work in future.

To this end, we held meetings with the following people:

- Bernardino D. Novela, Director, Administracao de Aguas do Centro (ARA)
- Antonio G. Melembe, Hydrologist, ARA
- Pereira da Silva, Director Regional, Aguas de Mocambique
- Gregory Saxon, Consultoria Pecuaria e Agro-Pecuaria
- Roberto Zolho, Natural Resources Manager conducting research in Gorongosa National Park
- Various faculty members at Catholic University, Beira

Following the field trip, the project principals held formal meetings back in Harare on the evenings of 1/10/00 and 2/10/00 to discuss ways forward. Attending these meetings were Tabeth Matiza, GWP, and Jennifer Katerere, an environmental lawyer, both of whom we hoped, at that stage, to involve in the project – Matiza to focus on environmental health and Katerere to focus on international law and river basins. However, due to a variety of constraints, these individuals were not directly involved in the project, though they were consulted informally from time to time.

Following these scoping exercises, a number of papers were written (see section 4 below) and students were brought into the project.

2. CAPACITY BUILDING AND THE ROLE OF STUDENTS

2.1 *Recruitment of Students*

In early October 2000, and shortly following the Mozambique field visit, an advertisement for 6 student scholarships was placed in the *Mail & Guardian*. Among other things, the advert stated that the award was open to citizens of SADC. A total of 20 applications were received, most of them from South Africa but several from Kenya, Swaziland, Zambia and Zimbabwe as well. Closing date for applications was end-November.

Decisions regarding the award of scholarships were made during 9/12/00 and 15/12/00. Swatuk came to Cape Town and he and Thompson closely vetted all applications. In our opinion, there was only one first-class applicant, **Barbara Tapela**. All of the others were in the 2.ii range. While some candidates seemed more likely to perform well in the programme than others, final decisions were taken on the basis of a number of capacity-building oriented criteria: e.g. applicants who were not in full-time employment were privileged over those who seemed to be on a 'career-track'; younger applicants were privileged over older applicants. There were three female applicants, two of whom were very strong. We had decided to award

scholarships to two of the females, but one of the applicants, **Weziwe Ncame**, took up full-time employment prior to receiving the award.

Following is a list of the 6 M.Phil. candidates, including a bit of their academic background:

- Dumisani Dube, B.A., Vista; B.A. (Hon.), RAU, geography/psychology and public administration, grades in courses on environment were very good
- Makhosi Gogwana, B.A. and B.A.(Hon.), UWC, geography and social anthropology, worked for DWAF on Fynbos project
- Moses Makwanise, B.Sc. (Hon), U. Zimbabwe, economics, hails from Dangamvura, Zimbabwe
- Gilbert Mosupye, B.A. and B.A. (Hon.), Vista, geography and psychology, did several courses in environment
- Azidowi Mukheli, B.A. (Hon.), Venda, M.P.A., UWC, public administration
- Barbara Tapela, B.A., U. Zimbabwe, B.A. (Hon.), Venda, M.A. (Pretoria), natural resources management, worked for Department of Natural Resources in Zimbabwe, focussed on river pollution for her Honours paper at Venda, has several publications in academic journals

Five are either South African (Dube, Gogwana, Mosupye, Mukheli) or resident in South Africa (Tapela). One is from Zimbabwe (Makwanise). All six began their programme in early February 2001, were resident at UWC and were registered as M.Phil. students in the School of Government.

2.1.1 Course Work

As per regulations, students completed **5 modules** and prepared **thesis proposals**. Three modules were completed in February, one in April, and one in August following the field trip. All modules were open to registered students in the post-graduate programme of the School of Government. A list of modules follows:

- Water and Politics (taught by Swatuk in February)
- Basic Hydrology with a special focus on the study area (taught by Van der Zaag in February)
- Research Methods (taught by Hara, Thompson, Swatuk)
- Political Economy of Southern Africa (taught by visiting Professor Tim Shaw of the University of London)
- Gender and Development (taught by Thompson)

The research proposal exercise built on the Research Methods course and was overseen by Hara. Student research proposals were, however, discussed by all project

principals and all students made at least one significant revision before undertaking field work. Remedial methodology classes were held in field.

2.1.2 Preparations for Field Work

It should be noted that, aside from Tapela, all students came to the project with weak research skills and little demonstrated capacity for critical thinking. As a result they required an enormous amount of supervision, including feed back and editing of written work, and numerous one-on-one sessions regarding conceptual frameworks, findings and the like – both pre- and post-field work. At the same time, it should also be noted that all students performed exceptionally well over the course of the project.

To be fair, these students were hand-picked not merely as a capacity building exercise, but to assist directly in a pre-designed research project. As a result their research topics were pre-determined. Research proposal formulation, therefore, was a bit of a blind exercise since students were proposing to conduct research in an area totally alien to them (save for Makwanise who hails from Mutare). However, Van der Zaag's module was organised specifically around the Pungwe/Save River Basins.

Each student has shown remarkable growth as a scholar. Below are short summaries of their projects.

- **Tapela:** Institutional performance in the water reform process in Zimbabwe with a specific focus on the Save Catchment and its new and existing structures. The theoretical frame here is how institutional reform based on catchments may enhance human security.
- **Dube:** Stakeholder participation in the water reform process in Zimbabwe with a specific focus on the Save Catchment, but also drawing on the experiences of other Catchment (Mazowe, Manyame) exercises. The study draws on various theories of participation.
- **Mukheli:** Water and sanitation management in peri-urban areas with a focus on Sakubva, a high-density suburb of Mutare. The theoretical frame here is one of achieving 'human security' through institutional reform focused on 'lowest appropriate levels' of management.
- **Mosupye:** Water and sanitation management in peri-urban areas with a focus on Sakubva, a high-density suburb of Mutare. The theoretical frame here is one of stakeholder participation and the creation of adaptive institutions in the management of natural resources.
- **Gogwana:** Urban agriculture for food security, with a focus on Dangamvura, a high-density suburb of Mutare, Zimbabwe. The theoretical frame here combines an ethnographic approach to urban agriculture with Putnam's notion that building social capital strengthens communities and enhances participatory democracy.
- **Makwanise:** Urban agriculture for food security, with a focus on Dangamvura, a high-density suburb of Mutare, Zimbabwe. The theoretical

frame here is how urban agriculture contributes to achieving ‘human security’. His research focuses more specifically on the gendered aspects of urban agriculture and food security in Dangamvura.

Taken together, these projects -- with their theoretical focuses on participation, adaptive institutions, and human security, and issue areas of food security, gender, water and sanitation provision, stakeholder participation – contribute centrally to our broader overall topic of ‘*Contesting the Water Wars Hypothesis in Southern Africa*’.

As might be expected, a great deal of logistical effort went into organising the field work. None had flown in an airplane before; none had passed through airport customs before. Hara accompanied the students to Harare from Cape Town where there were minor glitches.

2.1.3 Field Work

The field work involving students was divided into **three segments**:

2.1.3.1 Harare 18-23/6/01

The first week was organised around orientation, primarily for the students. Group interviews/lectures were organised (e.g. with Zeb Murungweni, a consultant for GTZ, and a central figure in Zimbabwe’s Water Resources Management Strategy; Jim Latham, a member of the Lower Manyame Sub-Catchment Council) as were visits to various resource centres (Institute for Water and Sanitation Development; IUCN; Southern African Research and Documentation Centre; Centre for Applied Social Science; ZERO; SARIPS). Students and core researchers also conducted several interviews with various people involved in the water reform process in Zimbabwe.

2.1.3.2 Mutare 23/06/01 – 17/07/01

The project principals paid visits to the ZINWA offices, the Catchment Manager, various departments at the City Council and to Africa University as part of a scoping exercise to determine how best to structure the short month in the field.

It was decided that students would work in pairs.

- **Dube and Tapela**

Dube and Tapela would concentrate on the formal institutions of the Catchment and sub-Catchment Councils. In addition to attending meetings of the CC and the SCCs, this entailed interviewing all relevant stakeholders in the water reform process: City Council, Rural District Council, Provincial Administration, NGOs, donors, among others. To this end, they had the use of a project vehicle loaned to us by IHE-Delft at the University of Zimbabwe. On several occasions one or more of the project principals accompanied them to these meetings and/or formal interviews. Daily debriefings were held.

With regard to the other four students, it was decided that their time would best be used if **home-stays** could be organised for them in the high-density suburbs. Through

the Departments of Health and Housing, permission was granted to do this. Home stays were facilitated through a **Peer Education programme** run by the City Council, overseen by the Department of Health and located in Sakubva.

- **Mukheli and Mosupye**

As Mukheli and Mosupye were working on water and waste management, it was decided to locate them in the homes of peer educators (drawn from unemployed youths under 20) in Sakubva – a high-density suburb originally designed for up to 8,000 men but now housing close to 60,000 people, often in very dire conditions. Mukheli stayed in the Muchena area of Sakubva in a ‘shack’ for two weeks. Mosupye stayed in the New Zororo area in a privately-owned home. Originally it was thought that they would undertake separate, ethnographic-style studies based on the very different living conditions. Ultimately, it was decided that they would work together – assisted by their homestay ‘brothers’ – and focus their work on all of Sakubva.

- **Gogwana and Makwanise**

Similar arrangements were made with Gogwana and Makwanise. But as they were working on urban agriculture, it was decided that they be located in a different township – Dangamvura – which is some few kilometres away from Sakubva along the road to Chimanmani. Unlike Sakubva, there is much more open space and less general peri-urban congestion in Dangamvura. Urban agriculture is widespread. Their research was conducted together and facilitated by their homestay ‘brothers’.

The home stay period lasted two weeks. Clearly this was only enough time to provide (a great deal of) mostly anecdotal evidence; however, given that there are so few studies of any kind regarding these sorts of issues, the value of the home stay experience cannot be over-estimated.

2.1.3.2.1 General Methodology Followed by Students

This is discussed in detail in Chapter 4 of the report.

2.1.3.2.2 Project Principal Input

During the home stay period, one of the project principals conducted his own research, following up many of the leads provided by the students, but also ‘covering the tracks’ of them, so that a complete picture of water access and usage in the Save catchment area was obtained.

2.1.3.2.3 Contextual Exercises

Group visits were undertaken to the Pungwe Water project off-take point, and to the major water supply dams in the area. This exercise was very valuable as it helped build team-spirit and give a real texture to many of the issues students had only read about.

2.1.3.3 Harare 17/07 – 21/07/01

The last portion of the field trip was designed to provide time for follow-up. Students and project principals now armed with a more precise focus paid return visits to the organisations listed above. Some also conducted interviews with donors, members of ZINWA, the Department of Water Development, and the National Action Committee.

2.1.4 Interviews

All researchers conducted numerous formal structured and semi-structured interviews with the people identified below.

- Mr. Chindawande (Asst. Provincial Administrator, Ministry of Local Government, IRWSSP Local Coordinator)
- Chirawu, J. (Environmental Health Officer, City Council of Mutare).
- Mr Chereni (Gender Officer, IRWSSP, Ministry of Youth, Gender and Employment Creation).
- Mrs. Goromonzi (Programme Manager, NAC (IRWSSP: National))
- Latham, J (Commercial Farmer's Union Representative and PhD candidate at Department of engineering at University of Zimbabwe)
- Latham, R (Chairperson, Save and Odzi CC and SCCs)
- Mr. Mapondera (Pungwe SCC Deputy Chairperson)
- Marunga, A. (Engineer, City Council of Mutare)
- Mr. Middleton (Pungwe SCC Chairperson)
- Mr. Mudege (Director, IWSD (IRWSSP Management))
- Mr. Mupingo (Provincial Administrator)

- Murinye, T. (Catchment Manager, Save River Catchment Council, Mutare).

- Ms. Muriri (Pungwe SCC Councillor)

- Murungweni, Z. (Advisor to GTZ on Water Sector Reforms, Harare)

- Mr. Muzaqana-Sithole (Save CC, Training Officer)

- Muskwe, G. (Water and Sewerage Engineer, City of Mutare).

- Mr. Nyikaramba (Provincial Officer, Department of Natural Resources)

- Mrs. Nyakutombwa (Pungwe SCC Councillor)

- Mr. Schonbauer (Consultant: CC/SCC Training Manual, IWSD)

- Tagwira, F. (Professor, Faculty of Agriculture and Natural Resources, Africa University, Mutare).

- Mrs Tsinakwadi (Ministry of Gender, Youth, and employment creation)

- Other interviewees include Tombstone-makers, Lease-holders, Executive members of Mutare Residents Ratepayers' Association and residents of Sakubva.

2.1.5 Post-Field Work

2.1.4.1 Student Research Projects

- August-December 2001

To facilitate the completion of this project – including the writing of student theses (60-100 pages), Swatuk was granted a research leave from the University of Botswana for the period August 16-December 31. He was also awarded a Ford Foundation fellowship to help finance his work on this project and related research. While resident at UWC, Swatuk assumed primary responsibility for supervision of the students.

Five of the students and two of the principal researchers presented papers based on field work at the *2nd WARFSA/Waternet* conference hosted by UWC on 30-31 October 2001. The occasion of this meeting provided the ideal opportunity for students to set down formally what amounted to a miniature version of their envisioned theses.

In the run-up to this meeting, four of the students presented draft versions of their papers in roundtable format to the School of Government's Occasional Seminar Series. These meetings provided invaluable feedback for the larger thesis projects.

In addition, Tapela, as part of an exchange programme between Uppsala University and the School of Government, UWC, went to Sweden for two weeks (end September-beginning October) to attend a workshop where her preliminary research findings were presented.

By the December/end of year break all six students had completed at least 3 chapters of their theses.

- January-April 2002

Completion of Theses

Swatuk returned to the University of Botswana in early January. Hara resumed primary responsibility for the students from that point, although they continued to work in tandem.

All student theses were completed to the satisfaction of the co-supervisors (Hara and Swatuk) by the beginning of April 2002.

Core Objectives

A wealth of primary and secondary data was collected during the three research trips (July 2000; Sept-Oct 2000; June-July 2001), and, as can be seen in Appendix 3 below,

a large number of research papers were written, presented at a wide variety of international forums, and published.

As per item 2.7 of the original project proposal (*Outcomes of this project*), it is clear that the core objectives have been achieved:

- A *corps of graduate students* have been trained. Each show a demonstrated capacity to carry out a directed research project and to think creatively and constructively about the ways and means of resource use and management.
- A wide variety of *inter-institutional linkages* have been built in the region as the direct result of this project. Through the Centre for Southern African Studies at UWC, we have developed a working relation with identified partners at Africa University, the University of Zimbabwe, and the Catholic University of Beira. In addition, as a direct result of this research links have been made to several international NGOs, and one international research project organised by Queen's University in Canada. It has also resulted in the formation of a Save River Catchment working group that will meet for the first time in June 2002.
- We also managed to establish linkages with a number of *community based organisations*, in particular the Peer Educator programme in Sakubva. Swatuk has continued to work with faculty at Africa University, so maintaining linkages with CBOs in Sakubva and Dangamvura.
- We have also worked toward identifying a number of *strategies for cooperation and conflict resolution* regarding water resource use. All student research papers and theses include policy recommendations. The June 2002 meeting in Harare of the Save River Catchment working group was specifically policy oriented. The edited collection that will emerge from this project, too, will be specifically policy oriented.

In the original project proposal, item 2.7, we identified six specific products. As can be seen in Appendix 2, we have managed to stay relatively faithful to this vision.

APPENDIX 2:

OUTPUTS

1.0 Papers presented at academic meetings

University of the Western Cape, School of Government, *Occasional Seminar Series, Bellville, South Africa*, 5 October 2001:

- Dumisani Dube and Larry A. Swatuk, 'Stakeholder participation in the new water management approach: a case study of the Save Catchment, Zimbabwe'
- Makosa Gogwana, 'The role of urban agriculture in food security: a case of low-income dwellers in Dangamvura, Zimbabwe'
- Azidowi Mukheli, Gilbert Mosupye and L.A. Swatuk, 'Is the Pungwe Water Supply Project a Solution to Water Accessibility and Sanitation Problems for the Households of Sakubva, Zimbabwe?'

University of Stellenbosch, Department of Political Science, *Occasional Seminar Series, Stellenbosch, South Africa*. 24 October 2001:

- L.A. Swatuk, 'Liberal peace and the price of (human) security: the new water architecture in Zimbabwe'

2nd Waternet/WARFSA Symposium entitled *Integrated Water Resources Management: theory, practice, cases, University of Western Cape, Bellville, South Africa*, 30-31 October 2001:

- Dumisani Dube and Larry A. Swatuk, 'Stakeholder participation in the new water management approach: a case study of the Save Catchment, Zimbabwe'
- Makosa Gogwana, 'The role of urban agriculture in food security: a case of low-income dwellers in Dangamvura, Zimbabwe'
- B. Gumbo and Pieter Van Der Zaag, 'Water losses and the political constraints to demand management: the case of the City of Mutare, Zimbabwe'
- Azidowi Mukheli, Gilbert Mosupye and L.A. Swatuk, 'Is the Pungwe Water Supply Project a Solution to Water Accessibility and Sanitation Problems for the Households of Sakubva, Zimbabwe?'
- L.A. Swatuk, 'Liberal peace and the price of (human) security: the new water architecture in Zimbabwe'

- Barbara N. Tapela, 'Water resource management: the challenge of integration in Zimbabwe's water sector reform process'

42nd annual meeting of the International Studies Association, **New Orleans, Louisiana**, 23-27 March 2002:

- L.A. Swatuk, 'The Liberal Peace and Water Security: the new water architecture in Zimbabwe'

Koordination Südliches Afrika (KOSA e.V.) International Workshop entitled *Das Gold der Zukunft? Nachhaltige Wassernutzung im Südlichen Afrika und in Deutschland*, **Bonn, Germany**, 3-5 May 2002:

- L.A. Swatuk, 'The New Water Architecture in Southern Africa: reflections on current trends'

Municipal Services Project meeting entitled *Services for All? The 'New' South Africa and the World Summit on Sustainable Development*, Wits University Graduate School of Public and Development Management, **Johannesburg, South Africa**, 15-18 May 2002:

- L.A. Swatuk, 'Subsidising Insecurity? Commercialisation and Privatisation in the Water Reform Process in Southern Africa'

Centre for Applied Social Science meeting on *Water Reforms in the Save River Catchment*, University of Zimbabwe, **Harare, Zimbabwe**, 23-24 June 2002:

- L.A. Swatuk, 'Water for All? An early assessment of the water reform process including ten ways to go forward'

43rd Annual meeting of the International Studies Association, **Portland, Oregon**, 25 Feb-2 March 2003:

- L.A. Swatuk, 'River Basin Security: Theory and Practice'

2.0 Papers published in *Security, Ecology, Community* working paper series

- Lisa Thompson and L.A. Swatuk, 'Gender and Ecosystems: Reframing Southern African "Security"', SEC working paper 1.
- L.A. Swatuk and Peter Vale, 'Swimming Upstream: Water and Discourses of Security', SEC working paper 2.
- L.A. Swatuk, 'Environmental Cooperation for Regional Peace and Security in Southern Africa', SEC working paper 3.

- Lisa Thompson, Barbara Tapela and Azidowi Mukheli, 'Engendering Security: lessons from the Pungwe River Basin, Zimbabwe', SEC working paper 4.
- L.A. Swatuk, 'Barking Up the Wrong Tree: violent conflict and deforestation in Africa', SEC working paper 5.

3.0 Papers published in academic journals

- Dumisani Dube and Larry A. Swatuk, 'Stakeholder participation in the new water management approach: a case study of the Save Catchment, Zimbabwe', *Physics and Chemistry of the Earth*, (special issue on water, vol. 27, 2002).
- L.A. Swatuk, 'The New Water Architecture in Southern Africa: reflections on current trends in the light of Rio +10', *International Affairs*, vol. 78, no. 3.
- Azidowi Mukheli, Gilbert Mosupye and L.A. Swatuk, 'Is the Pungwe Water Supply Project a Solution to Water Accessibility and Sanitation Problems for the Households of Sakubva, Zimbabwe?', *Physics and Chemistry of the Earth*, (special issue on water, vol. 27, 2002).
- B. Gumbo and Pieter Van Der Zaag, 'Water losses and the political constraints to demand management: the case of the City of Mutare, Zimbabwe', *Physics and Chemistry of the Earth*, (special issue on water, vol. 27, 2002).
- L.A. Swatuk, 'The Liberal Peace and Water Security: the new water architecture in Zimbabwe', *New Political Economy*, forthcoming.
- B.N. Tapela, 'Institutional Challenges in Integrated Water Resources Management in Zimbabwe: A case study of the Pungwe Sub-Catchment Area', (special issue on water, vol. 27, 2002).

4.0 Papers published elsewhere

- L.A. Swatuk, 'Environmental Cooperation for Regional Peace and Security in Southern Africa', in Ken Conca and Geoffrey D. Dabelko, eds, *Environmental Peacemaking*, (Washington: Johns Hopkins University Press in association with the Woodrow Wilson Centre, 2002).
- L.A. Swatuk, 'Barking up the wrong tree: violent conflict and deforestation in Africa', in Abe Ken-ichi, Deanna Donovan and Wil de Jong, *Extreme Conflict and Tropical Forest Loss*, (Kyoto: Kyoto University Press, 2003).

- L.A. Swatuk, 'The New Water Architecture in Southern Africa: reflections on current trends', forthcoming as a Koordination Sudliches Afrika (KOSA e.V.) occasional study, (Bielefeld: World House).
- L.A. Swatuk, 'Water Reforms and Privatisation Processes in Southern Africa, *Yearbook of African Affairs* (University of Bremen, 2003).
- L. Thompson, 'Discourses everywhere and not a drop to drink: water as a lens on environmental security', in Tor Arve Benjaminsen, Ben Cousins and Lisa Thompson, eds, *Contested Resources: Challenges to the Governance of Natural Resources in Southern Africa*, (Bellville: Programme for Land and Agrarian Studies, 2002).

5.0 Student M.Phil. Theses (deposited with the School of Government, UWC)

- Dumisani Dube, **Stakeholder Involvement in Water Resources Management: the case of the Save River Basin**
- Makhosi Gogwana, **The role of urban agriculture in food security: a case of low-income dwellers in Dangamvura, Zimbabwe**
- Gilbert Mosupye, **Is the Pungwe Water Supply Project a Solution to Water Accessibility and Sanitation Problems for the Households of Sakubva, Zimbabwe?**
- Azidowi Mukheli, **Managing Water for Human Security in Zimbabwe: the case of Sakubva**
- Moses Makwanise, **Urban Agriculture on the Policy Agenda: a case study of Dangamvura, Zimbabwe**
- Barbara N. Tapela, **Institutional Challenges in Integrated Water Resources Management in Zimbabwe: A case study of the Pungwe Sub-Catchment Area**

6.0 Forthcoming

- Larry A. Swatuk, **Water and Human Security in Southern Africa** (under discussion with publishers).

APPENDIX 3:

REFLECTIONS ON THE PROJECT

1.1 The Evolution of the Research Area

While the working hypotheses of the project never varied, the locus for empirical research changed as the research team evolved. It quickly became clear that we were over ambitious in casting the original project in a comparative framework. Originally, we envisioned a comparative analysis of three river basins – the Okavango, the Limpopo and the Save. As it became clear that resources would not stretch as far as originally anticipated, and that career changes meant certain individuals would no longer be able to participate, we first shifted focus to two – the Okavango and Save – then one – the Save (wherein we also included the Pungwe) – wherein we could comparatively examine, among other things, the performance of sub-catchment councils, important water resource use issues, the ways in which issues were framed and addressed. Even here, however, due to financial restraints, we were only able to conduct a limited number of empirical studies in the Zimbabwe portion of the basins. While the scoping exercise in the lower half of the Pungwe gave us a very good sense of the entire Pungwe Basin, and while a number of desk studies and secondary materials augmented our understanding of both the Save and Pungwe, a major lacunae of the project is a detailed study of similar issues facing people, communities and institutions downstream.

1.2 Methodology with a specific look at approaches to capacity building

As stated above, one of the central aims of this project was capacity building. More specifically, the enlisting of 6 graduate students in the completion of this project, each of whom would earn an M.Phil. for his/her efforts at the end of this project (assuming successful completion of stipulated criteria).

It seems to us that the capacity building exercise was an unmitigated success. Indeed, all six students finished their requirements, including the preparation of mini-theses, within 18 months. In the absence of certain key institutional supports, however, it is unlikely that such a process may be easily replicated in future.

There was a steep learning curve in all aspects of the project involving students. As highlighted above, from the beginning it was clear that they were, with the exception of Tapela, weak in terms of methodology and basic research skills. Performance in the course modules was alright, but glaring weaknesses were made apparent following presentation of draft thesis proposals.

Clearly, we were presented with a problem: to train students in basic research skills while trying to use those same students to assist us centrally in the collection and analysis of data. Part of the problem was created by us in that we devised the project and then sought to slot students into various aspects of it. Although the Van der Zaag module on hydrology introduced students to the research area, and although we attempted to guide their project formulation, it was clear that the students were grasping at straws: there was very little published literature on the research area and

there was no way to give tangible meaning to it until the actual fieldwork period began.

Most of these problems fell away as the project shifted to field work. However, other problems arose: student capacity to undertake independent research, particularly in a foreign country about a topic they knew very little of, meant that countless hours were spent in preparatory and remedial endeavours – hours that, in the hands of more capable students, would have been used more profitably and that would have yielded more information for the project. As stated several times in this report, these observations do not apply to Tapela who was quite comfortable with the entire process. Indeed, her presence was a steadying and positive influence throughout. This is a specific observation we return to make again in a more generalised way below.

We were also faced with the problem of trying to devise manageable research topics for them *in situ*. Given their aforementioned limitations, the challenge became how to create a project small enough for them to handle, but big enough in the sense that it helped achieve the aims of the wider topic of inquiry.

We settled on an ethnographic approach to resource use and management. We also settled on a participant observer approach involving ‘home stays’ – a common enough strategy used in development circles, particularly where student exchange programmes are concerned. While Swatuk through his work with World University Service Canada has quite a lot of experience in this regard, Van der Zaag was familiar with the area and the sorts of on-going programmes to which we might become attached. The Peer Educator programme on HIV/Aids awareness was the ideal vehicle.

As stated earlier, we were ground breaking at every turn. This did not seem to deter the students. In fact, they seemed to take quite readily to the task. It did, however, mean that a large amount of what might have been research time was given over to supervisory and organisational tasks carried out by project principals. Were we to follow up this research, however, these networks are now in place and would no doubt smooth the path of another group of students.

Would a more accomplished group of students have achieved more? The answer is an unequivocal yes. The weekly debriefings and accompanied transect walks revealed a relatively haphazard approach to collecting data. The point of the debriefings was, of course, to try and give form and focus to data gathering. But, the point is, a more capable group of students would have collected data in a more systematic way. Whether their results would have been any different than those revealed in the student theses is hard to say – while weak on quantitative markers, the student research was, in our opinion, strong in qualitative analysis. Yet, the wide research capability gulf between Tapela and all the other students leads to the obvious conclusion that the project underachieved during the fieldwork portion. This raises the more generalisable point regarding intake of students: should there be an M.A./M.Sc./M.Phil. pre-requisite for entry into such a pre-defined project?

It is also apparent to us that were it not for a timely coincidence of events – Swatuk’s research leave from University of Botswana combined with the post-field work portion of the project – the students probably would not have finished on time or, in

some cases, at all. The August-December period was very much a 'hands on' time. Obviously, neither Hara nor Thompson would have been able to devote such time to the project given existing commitments to the University and demands on their time. This raises the valid question of replicability of the project: given the same sort of mix of students, would they be motivated enough to complete their theses without almost daily feedback? Perhaps a future project of this sort could be organised in such a way as to take advantage of principal researcher winter holidays, for example. Or perhaps fewer students could be taken, so as to reduce time pressures on already over-burdened staff. Or, if entry requirements into such a combined scholarship/capacity building pre-defined research project were raised, making a Master's degree a pre-requisite, then perhaps it could also be managed successfully.

In any event, as a one-off experience the project yielded surprising results. All six students have completed their requirements. All demonstrated capacity for critical and analytical thinking. The findings contained in their theses are meaningful and form a strong basis for expanded research in these areas.

2.0 Future Research

As stated above, limitations of time, financial and other resources, led us to concentrate efforts on only one part of the Pungwe and Save River Basins (i.e. the Zimbabwean side) and to focus on very clearly defined and delimited aspects of water resources management therein (rural and (peri-)urban '**human security**' – water, waste, food – issues, **institutional reform** and **stakeholder participation**).

An obvious area for future research is the Mozambican side of the catchment areas. Thus, it is our hope that we might have a two-pronged follow-up project: (I) one element that continues to focus on the issues identified above; and (II) one that begins to look more substantively at the Mozambican side of the Basins, perhaps treating the same issues and using the same methodology (e.g. institutional reform in the water sector in Mozambique; water and sanitation issues, urban agriculture in and around Beira).

In terms of item (I): The water reform process is at an early stage of implementation. It would be logical to monitor the situation for two more years. In an earlier iteration of the project proposal we stated our intention to undertake a *comparative study* of water resources use and management, including the Okavango River Basin in our second stage. (Some of the theoretical background for this is to be found in SEC working paper #3.) However, we are now given to reconsider this position for two reasons. The first reason has already been stated: the Save Catchment Council experience should be continuously followed so as to build on, inter alia, formal and informal institutional links developed, and our comparative strength in data gathering and analysis. The second reason has to do with comparative advantage. The IUCN is beginning a large multi-basin study of water resources use, with a particular focus on demand management. They do not include the Save River Basin; they do include the Okavango. It seems to us that we will better contribute to the state of knowledge on water resources usage in Southern Africa by building on our formative links in Manicaland. This does not rule out linkages with the IUCN and other related projects (like that funded by the European Commission in the Okavango River Basin).

In terms of item (II): The glaring lacunae in our project is the Mozambican downstream perspective. Some of the issues surrounding international cooperation on basin usage are treated in the Van der Zaag and Swatuk papers highlighted above. But a detailed understanding is far beyond our present capacity. It begs for sustained analytical attention.

End: 10/3/3