

Communicating integrated water resources management: From global discourse to local practice – Chronicling an experience from the Boteti River sub-Basin, Botswana

Larry A. Swatuk^{a,*}, Moseki Motsholapheko^b

^a University of Waterloo, 200 University Avenue West, Waterloo, Ontario, Canada N2L 3G1

^b Harry Oppenheimer Okavango Research Centre, University of Botswana, P Bag 285, Maun, Botswana

ARTICLE INFO

Available online 8 July 2008

Keywords:

Project management
IWRM
River Basin
Botswana
Ngamiland
Boteti River

ABSTRACT

The Boteti River is an ephemeral outflow of the Okavango River. It lies in the north-western part of Botswana where about 25,000 people reside across a number of widely scattered villages and informal settlements. The river, with its seasonal streams and pans, is vital to the livelihoods of these people, their livestock, and the wildlife that share this physical space. A combination of factors has led to widespread degradation of the physical resource base – both in the river bed itself and in the wider environment. As part of its outreach role, the Harry Oppenheimer Okavango Research Centre has undertaken a multi-year project along the Boteti River to assist people there with the rehabilitation of their resource base. The globally influential concept of integrated water resources management (IWRM) provides the analytical framework, in particular its emphasis on dialogue and stakeholder participation. The project has three primary aspects: facilitation of a dialogue platform; action-research; outreach and information dissemination. After two years of implementation, the project has collected a good deal of data and established a River Basin Forum with a common vision. However, the project continues to face difficulties in implementation: participation is limited; myths regarding resource degradation are difficult to dispel; meaningful communication among differently empowered actors is hard to achieve; and there are numerous human, financial and technological limitations. The primary researchers continue to alter their methods in the hope of achieving a functioning River Basin Committee (RBC), but observe that the globalized ideals of IWRM are, in this particular case at least, of limited use when attempting to alter localized management practices in basins with deeply embedded social and cultural practices.

© 2008 Elsevier Ltd. All rights reserved.

1. Introduction

In order to effectively conserve, protect, develop, manage and utilize this vital resource [water] it is essential to encourage and strengthen multi-stakeholder, multi-disciplinary and cross-sectoral exchange and dialogue... [A]ll perspectives need to be considered in on-going reflection and debate to ensure a water-secure future for the world.

- World Water Council. <http://www.worldwatercouncil.org/index.php?id=88&L=0> (accessed 28.09.07.).

We don't seem to grasp the issues very well. We don't know whether we are going to have water. How are we going to improve livelihoods here without water? ...It seems we are

going to say the same things. We don't understand the issues of natural resources very well.

- Boitshoko Molomemoi and Diphtuti Ndonyama (Makalamabedi Central *kgotla*¹ meeting, 21/2/2007).

Over the course of the last 35 years – i.e. since the 1972 United Nations Conference on the Human Environment held at Stockholm – concerns regarding water resources use and management have steadily risen up global development and security agendas. A steady stream of media reports concerning floods and droughts, abnormal and irregular weather events (cyclones, hurricanes, el nino, la nina), rising seas, and global ice melt – some or all of it linked to fears over climate change and global warming – have seeped into popular consciousness such that 'water wars' are considered real possibilities and a 'world water crisis' is widely accepted as fact.

* Corresponding author. Tel.: +1 902 406 5188.

E-mail address: swatukinthebushes@yahoo.com (L.A. Swatuk).

¹ A Setswana word (an official language of Botswana) meaning 'formal community gathering'.

Such fears and perspectives have helped mobilize human, technical and financial resources worldwide, perhaps best symbolized by the creation of the multi-stakeholder World Water Council and the Global Water Partnership in 1996, and the holding of the biannual World Water Forum, last held in Mexico City in 2006.

As the opening epigraph attests, it is generally agreed among the world's water experts that effective communication among as wide and inclusive a network of 'stakeholders' as possible constitutes a central pillar of sustainable water resources management at all levels of social organization: local, national, regional, and global. Disseminating both this message and the tools available for its actualization is facilitated through an endless array of water and related resource organizations worldwide (see <http://www.cap-net.org/CapLinksBrowse.php> and <http://www.gwptoolbox.org>).

But as the second epigraph suggests, achieving sustainable and equitable water resources management where it is most needed – among the poor, in densely populated peri-urban settlements, in sparsely populated remote rural areas – remains an exceedingly difficult task. Not only are human and financial resources limited, the ways and means of effectively communicating with people are made more difficult by key factors such as geography, language and culture. How to get there; what to say; and how to say it are not self-evident processes in such cases.

2. Methodology

This paper undertakes a critical and reflexive exercise in project analysis. The paper describes and reflects on the process of attempting to facilitate the creation of a River Basin Forum (RBF) and, ultimately, an empowered and effective River Basin Committee (RBC) in the Boteti River Basin of Botswana (see Fig. 1). The project has been underway for more than two years and is slated to end in December 2009. The project combines action-research (i.e. research undertaken in direct response to perceived local needs; research that will facilitate decisions toward best practice) with the facilitation of a dialogue platform for equitable, efficient and sustainable resource management at the River Basin scale. As shown below, the project faces several hurdles if it is to be successful, with success being described variously as the creation of a functioning River Basin Committee (the ideal outcome), and as a process that fosters sustained, fruitful discussion among relevant

stakeholders, the outcome of which will be determined by the actors themselves (a more realistic outcome given the human resource, time and financial limitations of the project).

To adequately reflect on the progress of the project in light of IWRM goals, it takes several deliberate steps. The paper proceeds as follows: the third section describes the analytical framework – integrated water resources management (IWRM) – underpinning the project. The fourth section briefly describes the project. Section 5 outlines the project area, i.e. the Boteti River Basin in Botswana. Section 6 provides a critical reflection on the project methodology, focusing on, among other things, technological, physical and cultural aspects of communication. The final section links the practice of the project to its analytical framework and makes several suggestions regarding improved performance.

3. IWRM: dominant paradigm, discursive space

In a recent discussion paper, Allan (2003) suggested that IWRM – integrated water resources management – had become a 'new sanctioned discourse' marking a 'fifth paradigm' in the history of water management. IWRM, as defined by the Global Water Partnership, 'aims to ensure the coordinated development and management of water, land and related resources by maximizing economic and social welfare without compromising the sustainability of vital environmental ecosystems' (Solanes and Gonzales-Villareal, 1999, p. 2). In this rendering, IWRM is described as a process, a means to the end of using water without 'compromising vital ecosystems' but still 'maximising economic and social welfare'.

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

The rise of IWRM to the centre of global water management is nothing short of remarkable (see Conca and Ken, 2006 for a detailed discussion). It marks the apex of more than three decades of discussion and debate by an increasingly inter-linked network of experts, interested parties and influential decision-makers. Expressed in terms of their web-pages, IWRM marks the discursive centre of activity among 'dot org', 'dot com' and 'dot gov' (Allan, 2003).

General agreement among 'the converted', however, is not the same as having marshaled an effective force for meaningful change. In time, this may be so. Yet, given the intensely political nature of water development (Postel, 1999), it has proved possible to both support IWRM and to continue to 'push rivers around' (Conca and Ken, 2006). After all, water does not necessarily obey the laws of gravity; it flows toward money (Reisner and Marc, 1993).

Allan (2003) argues that worldwide approaches to water management have passed into a fifth paradigm wherein IWRM constitutes its core. Briefly stated, the first paradigm is associated with pre-modern communities with limited technical and organizational capacity. The second paradigm is that of industrial modernity where the state and private sector activities, assisted by

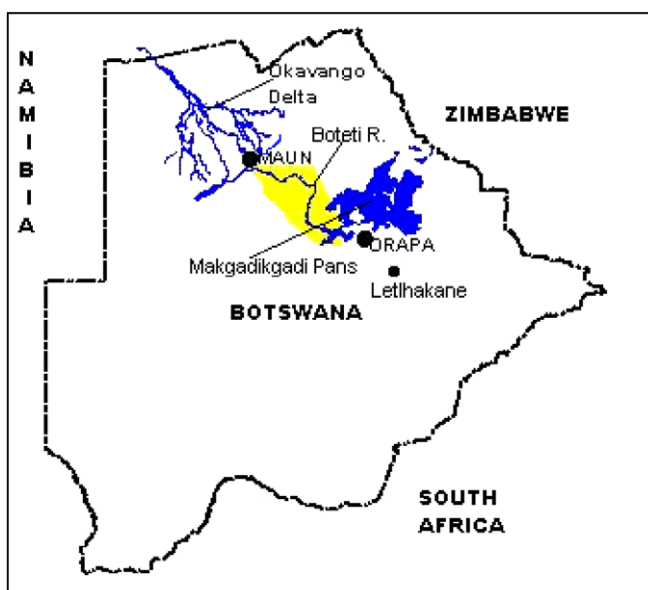


Fig. 1. Map of Botswana, with the Boteti River in North-Central Botswana.

developments in science and technology, gave shape to the 'hydraulic mission' (i.e. harnessing water resources for human needs as typified by the era of 'big dam building'). Allan argues that the next three paradigms resulted from society-wide skepticism in the North regarding the ability of science to find solutions to problems deriving from human activity, an era Beck (1995) and others have labeled 'reflexive modernity'. The third paradigm reflects the interests of environmentalists in reducing the human impact on the natural world. The fourth paradigm 'was inspired by economists who had drawn the attention of water users in the North to the economic value of water and its importance as a scarce economic input' (Allan, 2003, p. 11). 'The environmental and economic phases are still in train . . . [T]hey are being supplemented by a new fifth paradigm, which is based on the notion that water allocation and management are political processes' (Allan, 2003, p. 11).

Whereas other paradigms were pushed by partial interests (i.e. civil society, government, social movements, business), the fifth paradigm argues that all of these actors are central to the policy making discourse. An important observation made by Allan (2003, p. 15) is that, whereas the 'semi-arid plural North' can be seen to have accepted most of the ideas of the reflexive modern period, 'the South, where about five-sixths of the world's population live, is still very much involved in its hydraulic mission – the second paradigm'. Thus, '[t]he water policy discourses in the North and South are different. Those "outsiders" from the North who insist on preaching the environmental and economic values of water have little impact on the "insider" Southern water management discourses'.

This paper directly addresses this claim. Unlike Kuhn's distinction between normal and revolutionary scientific paradigms, approaches to water resources management at the level of the resource (as opposed to the level of conceptualization) reflect the uneasy coexistence of each of Allan's five so-called paradigms (perhaps better termed 'preferences'), with high-modern management approaches continuing to dominate approaches to water. This is why, for example, there has been so little impact of IWRM specifically on inter-state water sharing agreements where high political interests (e.g. water for hydro-power, cities or irrigated cash crops) often sideline IWRM-style considerations (Conca and Ken, 2006; Gupta and van der Zaag, 2006).

4. The project

Our project, formally titled 'Sharing Temporary Flood Waters in Southern Africa: Ephemeral River Basins-SADC (ERB)' (henceforth, ERB), is a multi-year activity designed to see whether river basin management committees are feasible in ephemeral river basins, where surface waters are extremely limited, where blue water may flow for only a few days per year in only part of the basin, and where the vast majority of people are dependent upon relatively accessible groundwater (either through boreholes or shallow wells) for their household needs and livelihood practices. Partner institutions are located in three different Southern African Development Community (SADC) countries – the Desert Research Foundation (DRFN, Namibia), the Harry Oppenheimer Okavango Research Centre (HOORC, Botswana), and a consortium from South Africa – the Surplus Peoples Project (SPP), the University of Cape Town (UCT), and the Agricultural Research Council (ARC) of the Western Cape.

ERB is funded by the Government of Norway through its embassy in Pretoria. Effective communication is at the heart of the project, as stated in the project document:

The active participation of local communities in shaping their own development agenda is key to effective and sustainable management of natural resources. Service delivery by govern-

mental institutions, international and local service organisations, non-governmental organisations (NGOs) and donors will be more efficient and effective if channeled through an organised local forum according to identified needs. A forum constituted by all parties involved and/or interested in the resources will further facilitate integrated planning and management of both natural and financial resources in the community.

Such a framework for river basin management draws directly on the stated preferred participatory and democratic methodologies of powerful 'water bodies' such as the World Water Council (through its World Water Vision), the European Union (through its EU Water Directive), and the Global Water Partnership. All SADC member states have, either in principle or in practice, adopted this 'new water architecture' (Swatuk and Rahm, 2004). In the case of Namibia, a functioning, empowered, multi-stakeholder River Basin Committee has been put in place in the Kuiseb River Basin. The ERB project seeks to replicate this recent success (see Botes et al., 2003; Manning and Seely, 2005 for details). 'Is the methodology fungible?' was a key question asked.

The project, steeped in 'fifth paradigm' IWRM values, is being implemented in a setting where 'participating stakeholders' hold a wide variety of (differing, competing) values reflecting their particular socio-economic, political, geographical and cultural settings. As may be expected, these differing values mirror vastly different actor capabilities. While these capabilities are often a consequence of power relations within a specific socio-political economy (e.g. government bureaucrats; semi-autonomous scientists; peasant farmers), it is important to note that actors wield different sorts of power – none is therefore 'powerless', not even those with the fewest material resources.

Also, following from Keck and Sikkink (1998) explication of 'norm localisation', our experience shows Allan's dichotomy of 'Northern outsider' and 'Southern insider' to be too 'hard and fast'. Clearly, most state-makers, particularly those in the low-consumption global South, continue to view water through a 2nd paradigm/high-modern lens: dams, pipelines, multiple-uses with minimal concern for the poor or the environment. They therefore make particularly good partners with high-consumption Northern donors, banks and engineering companies. Water experts outside the bank-government-business nexus, however, are more inclined toward 3rd or 4th or 5th paradigm frameworks. And, in areas such as the Boteti River Basin, people at the level of the resource at best aspire to 2nd paradigm practice: the deliberate and systematic use of technology to deliver more water for a better life. Those involved in our project often hold simultaneously to more than one of these perspectives (see Swatuk, 2005a for details).

5. Project area

5.1. The Boteti River sub-Basin

The Boteti River is a distributary of the Okavango River Basin. It begins at the Thamalakane River in the southern-most fringe of the Okavango Delta and stretches over a distance of about 300 km creating a sub-Basin covering an area of more than 29,000 km² (Republic of Botswana, 2002; see Fig. 2).² Historical trends for Lake Ngami and associated rivers, documented by Shaw (1985), indicate that the Boteti River used to flow perennially with intermediate periods of drying lasting only a few years except in the late 1920–1940s. Currently the Boteti appears to be going through a long dry span and has not received any flow through its entire length since the early 1990s. It currently has a wetter or perennial upstream up to 50 km

² Estimate derived from the Ground Water Resources study area, which excludes parts of Makgadikgadi Pans.

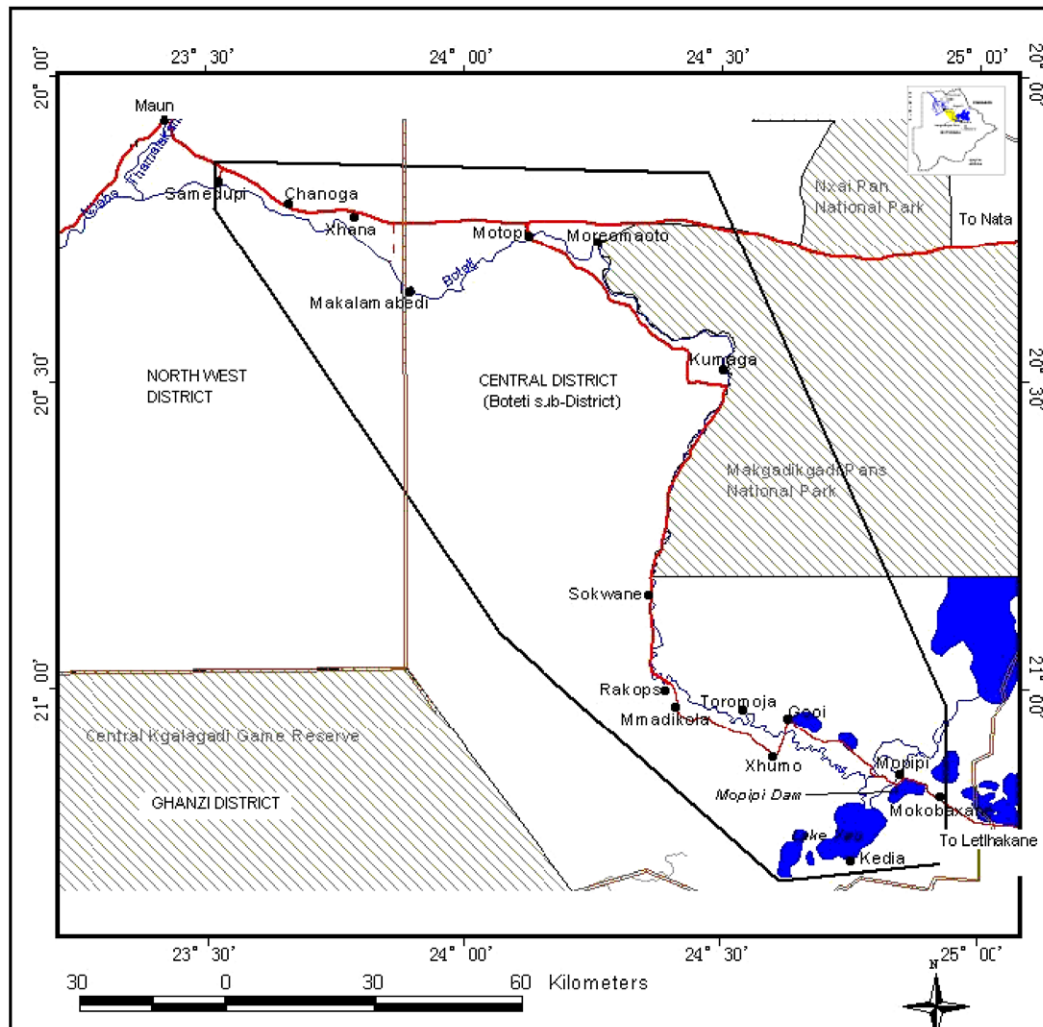


Fig. 2. Map of the Boteti Basin showing the project area (Harry Oppenheimer Okavango Research Centre, 2006).

from its source and a drier or ephemeral downstream spanning approximately 250 km. Overall, the Boteti River has since “been flowing at different occasions”, such flow being described as “erratic and unreliable” (Republic of Botswana, 2001: 10).

The Boteti River sub-Basin receives average annual rainfall of about 354–450 mm/year and it is highly unreliable with frequent periods of drought (Republic of Botswana, 2001; Vanderpost, 1995; Arntzen et al., 1994). Given the extremely high evaporative demand of the region, approximately 85–90% of all rainfall is either lost to evaporation or transpired by existing vegetation. The area is mainly covered by the Kalahari sands with associated woody vegetation of acacia and open grasslands with strips of riverine vegetation (Republic of Botswana, 2001).

5.1.1. Settlement distribution

The entire Boteti sub-district has 15 main settlements or villages, and numerous other smaller settlements. Each village is made up of numerous smaller settlements, or associated localities, of arable lands and cattle posts for livestock keeping (Republic of Botswana, 2001). Most settlements are found along the Boteti River from Makalamabedi (Central) in the north to the sub-district capital, Letlhakane, in the southern part of the district. Of the 15 main settlements 14 are found in the project area. Fig. 2 below shows the extent of the study area, settlements and location of the Boteti River sub-Basin.

5.1.2. Population

The Boteti sub-district of the Central District has a population of about 48,000 people, 2.9% of national population, sparsely settled with a density of 1 person per km² (Central Statistics Office, 2002; Republic of Botswana, 2002). Settlement along the river itself constitutes a population density of five persons per km² (Arntzen et al., 1994). The population of this sub-district has doubled in the 20 year inter-censal period 1971–1991 (Arntzen et al., 1994), while the mid-Boteti (part of the project area) population was reported to have increased by 52%, in the same period (Vanderpost, 1995). According to Arntzen et al. (1994) there is a long history of settlement along the Boteti River possibly dating back to AD700, mostly Kalanga, Bateti/Wayei, Herero, Basarwa and other ethnic groups. Of the total sub-district population more than half is found in the project area, i.e., 25,872 (Central Statistics Office, 2002). Table 1 below shows the population of Boteti sub-district, percentage annual growth rate and the percentage contribution of the sub-district population to Botswana rural in the period 1971–2001 (the date of the last census).

Past studies have documented general dispersal of population in the Boteti sub-district, and away from the Boteti River in the 1970s, and a reversal of this trend in 1980s and 1990s (Arntzen et al., 1994; Vanderpost, 1995). In the latter studies the authors noted that the dispersal may have been due to availability of water away from the river due to good rains as well as the introduction of

Table 1

Population of Boteti sub-district as percentage of "Botswana rural" in the period 1971–2001

Population	Botswana rural	Boteti	%
1971	530,228	^a 16,000	3.0
1981	781,413	26,406	4.9
1991	720,468	35,459	4.9
2001	770,383	48,057	6.2
Growth rate 1991–2001	2.4 ^a	3.0	–

Source: Central Statistics Office (2006).

^a Arntzen et al. (1994).

borehole technology. The population concentration in the 1980s was explained by the prolonged drought and related drought relief programmes, as well as the availability of social services, including village water supply in the major villages of Rakops, Mopipi and Letlhakane (Arntzen et al., 1994; Vanderpost, 1995). The effects of this concentration were the increased pressure on local resources, due to overstocking, overgrazing and over-harvesting, reductions in wildlife numbers, denudation of vegetation and the resultant exposure of the soil to wind erosion (Vanderpost, 1995). By the 1990s out-migration was noted as resulting from lack of opportunities that resulted from the above environmental challenges. Worthy to note regarding water resource use, at the household level, is that the sex ratio for the mid-Boteti declined in the 1990s due to out-migration and this led to a rise in the number of female-headed households.

5.1.3. Livelihoods

Livelihood activities along the Boteti River include livestock farming, dryland and *molapo* (flood recession) arable farming, veld products collection, fishing, formal and elementary employment and tourism related activities (Arntzen et al., 1994; Vanderpost, 1995; Republic of Botswana, 2001, 2002). Other supporting livelihood activities include beer brewing, remittances and social protection schemes.

Livestock farming is the predominant economic activity along and further away from the Boteti River (Republic of Botswana, 2002). The most dominant animals kept are cattle followed by goats, donkeys and horses. In 2005, the number of cattle was estimated at 150,276, a number much more than other types of livestock (Republic of Botswana, 2005).

The (perennial or seasonal) availability of surface water in the river results in higher concentrations along the river, while the availability of ground water sources, mainly from boreholes, has resulted in expansion of livestock rearing away from the river even to areas never before reached by settlements (Arntzen et al., 1994; Vanderpost, 1995; Republic of Botswana, 2002). Some cattle posts are found even deeper into the Kalahari sands, near the Central Kgalagadi Game Reserve. Livestock farming has had an impact on traditional hunting and gathering, through its impact on vegetation, as well as increased competition, with wildlife, for grazing pastures (Vanderpost, 1995; Republic of Botswana, 2002). Other key challenges to livestock farming include animal diseases, drought, predation by wildlife, saline water and limited livestock market.

Dryland arable farming is another useful activity in the Boteti area. It is practiced mainly away from the river where open fields are made by the removal of vegetation. It relies on the availability of rainfall. However, rainfall in the Basin is often unreliable (Arntzen et al., 1994; Vanderpost, 1995; Republic of Botswana, 2002, 2003, 2004). *Molapo* or flood recession cultivation of crops is conducted along the flood plains and is reliant upon the availability of flood water. Both types of crop farming serve as complements for livestock farming in a "diversified subsistence package" (Vanderpost, 1995). In the agricultural lands areas, farmers depend on

shallow wells, boreholes and village water supplies, for their potable water.

5.1.4. Use of river water

The main economic activities in the sub-Basin are livestock farming, arable agriculture and tourism. The river, and its associated pools and pans, is the main source of surface water used to water livestock, wildlife and in some parts *molapo* cultivation. *Molapo* farming and fishing are found mainly in the wetter parts of the sub-Basin, closer to the Okavango Delta. River water is in some cases used for construction purposes as in the case of major construction of roads such as the Mopipi–Rakops road. Water from the river also recharges ground water aquifers making it possible to obtain water from shallow wells and boreholes. Groundwater available from boreholes and wells is also used for the same purposes except *molapo* farming and fishing. Additionally, groundwater is used for domestic purposes.

A study on ground water resources conducted by Hydrogeo (Pty) Ltd. and Water Surveys (Botswana) consultants, in 2001, estimated that there were about 649 boreholes in the Boteti area (Republic of Botswana, 2001). However, this number may be higher since it excludes the area between Samedupe and Xhana which fall in the neighbouring North West District. The same study estimated domestic water demand at 650,000 m³/annum (1781 m³/day) and supply at 584,000 m³/annum (1600 m³/day), and that it exceeded supply by 66,000 m³/annum (180 m³/day). Livestock and wildlife water demand were estimated by the Ministry of Agriculture at 4350 m³/day and 1900 m³/day, respectively (Republic of Botswana, 2001).

A decade ago, the main environmental and socio-economic challenges facing the residents of the sub-Basin were found to be overstocking, overgrazing, deforestation and denudation of vegetation, wind erosion, drought, drying of wells, prolonged drying of the Boteti River and widespread poverty (Vanderpost, 1995; Arntzen et al., 1994). Vanderpost (1995). Key drivers leading to some of these problems, such as population growth, inappropriate management and commercialization of resource exploitation, have only gotten worse in the intervening years (ODMP, 2005). Local people are only too well aware of these problems, hence the perceived relevance of our project.

6. Reflection on project implementation methodology

6.1. Implementation

As stated above, the project goal is to assist in the creation of a River Basin management committee. Short of that goal, it is hoped that the process toward formation of this committee will enable more equitable, efficient and sustainable resource management in the area (i.e. IWRM as defined above). Toward this goal, the project is structured around three primary practices:

- Facilitation of committee formation.
- Action-research (information gathering).
- Outreach and feedback (information dissemination).

The project team is composed of three primary researchers, one full-time research assistant and others drawn in on a needs-basis. The partners in Namibia, Botswana and South Africa meet twice yearly to review work-plans, gauge progress, compare notes, brainstorm and trouble-shoot.

6.1.1. Facilitation

The method for facilitation combines direct one-on-one visits to all key stakeholders (in the project area and in the capital city,

Gaborone, where all key decision-makers are located), the organization of workshops (to establish a common vision; to constitute a basin-wide forum; to determine needs; to build consensus), the staging of field-visits (to facilitate learning) and stakeholder exchange-visits (to further build consensus and determine needs). The project works with gazetted villages within the Basin and works through two nominated persons from each village. These persons attend workshops, field- and exchange-visits. The project team, however, addresses all stakeholders in the basin regularly at *kgotla* meetings (formal community gatherings).

6.1.2. Action-research

The project deliberately seeks to avoid conducting pure research, though it is clear from the literature reviews conducted by project scientists that there are numerous gaps in knowledge of basin-level natural and social processes and dynamics. At the same time, much of the existing knowledge is out of date. In arriving at a sustainable resource management structure, however, the research team conducted numerous fact-finding and opinion-gathering exercises both in the basin and among key decision-makers.

6.1.3. Outreach and feedback

To build a committed constituency the project generates information about the basin itself and about the activities of the project. These materials are designed also to assist nominated members from each village to inform village and settlement residents regarding the project and the resource base itself.

6.2. Getting 'buy-in', building consensus

Typical of 'development projects' in general, implementation is far from a straightforward process. In our case, the perceived value of the project itself reflects a consensus among scientists directly involved in its implementation (nine people based in three different Southern African countries), the donor state (Norway), and support partners in southern Africa (DRFN in Namibia, HOORC in Botswana, and SPP/UCT/ARC in South Africa³). Getting 'buy-in' from key local stakeholders depends on how much the project speaks to their direct interests – be they short, medium or long term. As these interests vary across actors, buy-in is not easy – especially as the project seeks to alter settled social practices, specifically how water resources are managed at the basin level.

In eliciting government support, and among other factors, the relevance, form and effectiveness of communication strategies deployed by project implementers are key to achieving 'critical mass' in support of the project. In Namibia, government fully supports – with human and financial resources, through progressive legislation – the reformation of water management along IWRM lines (Amakali and Shixwameni, 2003; Bethune et al., 2005). The government of Botswana, in contrast, remains reluctant to widen the decision-making circle for a resource as critical as water (Swatuk and Rahm, 2004; Swatuk and Kgomo, 2007). This is not to say that there are no government supporters of either the specific project or the IWRM perspective. Nevertheless, to widen the net of support for the project we chose to frame its goals somewhat differently in presenting the project to government officials. Rather than try to sell it as a project seeking to alter or amend legal frameworks for water management (thereby both blaming government for 'deficiencies' and challenging their authority), we instead framed it as a natural resource rehabilitation project (which government, if they so chose, could interpret this to mean that local

people's practices were to be altered, thus shifting 'blame', and not challenging authority).

To gain legitimacy for our activities and to build government support for our project we deliberately sought to locate it as a pilot-project under the auspices of the government-supported, inter-departmental, donor-backed Okavango Delta Management Plan project (see http://www.iucn.org/themes/cem/documents/ecosapproach/esa_gbf_ramsar_okavango_2002.pdf). The HOORC is a key scientific-backstop in the development and implementation of the ODMP (see <http://www.orc.ub.bw>). The ODMP is located within the ambit of the Ministry of Environment, Wildlife and Tourism (MEWT) whereas water resource issues are under the purview of the Ministry of Mines, Energy and Water Resources (MMEWR). MEWT is a new and junior Ministry, in contrast to the senior and powerful MMEWR. In addition, MEWT is staffed by people who widely hold to 5th paradigm perspectives on water resources (as demonstrated by the framing of the ODMP project using an 'ecosystem approach'), whereas MMEWR is staffed primarily by old-guard, primarily 2nd paradigm men who regard water largely as a means to drive mining and energy sector development (with the multi-billion dollar, national North-South Water Carrier project being a good example of this). In response to global pressures, however, the MMEWR has designated a limited number of staff persons to concentrate on IWRM-style issues (e.g. the water conservation desk). Thus, our strategy has been to inform all relevant government actors of the project and to build a network of support among like-minded individuals across ministries. Given limited human and financial resources, we also linked with two key local Non-Governmental Organisations (NGOs).

6.3. Reflections

However, very often, a specific project morphs into a discursive space where actors reproduce settled social practices, thereby recreating old habits in new settings (Broch Due, 2000). Because of this, the actual outcome of the project may differ markedly from that originally intended by those who designed and supported it financially (see Swatuk, 2005b for an examination of this phenomenon in relation to natural resources management). In our case, we have seen most support for the project from (i) those most in need of its intended results, i.e. people resident in the Basin downstream of Maun, the district capital; (ii) like-minded actors, i.e. those in the Department of Environmental Affairs (DEA) tasked with implementation of the ODMP and local NGOs; and (iii) traditional allies in conservation research, i.e. the Ngamiland office of the Department of Wildlife and National Parks (DWNP). These groups were present at the inaugural workshop and together established the Boteti River Forum with the following vision:

- A protected and conserved Boteti River for ever!
 - o Empowered knowledgeable communities.
 - o Sustainable and healthy ecosystems.
 - o Secured livelihoods for all.

In Setswana, the official African language of Botswana (English is also an official language), the vision translates as

- Noka ya Boteti e e babalesegileng go ya bosaeng kae!

However, without government support, such proclamations are hollow. Unfortunately, we have had least support for the project from those actors with the most influence locally and nationally, i.e. the two District Councils (Ngamiland and Central), the Land Boards, and the MMEWR. While willing to meet with us one-on-one and to listen, their absence from the inaugural workshop

³ DRFN: Desert Research Foundation of Namibia; HOORC: Harry Oppenheimer Okavango Research Centre; SPP: Surplus Peoples Project; UCT: University of Cape Town; ARC: Agricultural Research Council, Western Cape.

was telling. Silence through absence is a common form of the exercise of power where influential actors either fail to perceive the utility of changing current practice or feel threatened by it. As a steering committee member in the ODMP process, one of us regularly experienced this type of ‘stone-walling’ by one or more government departments. In the particular case of our project workshop, when an explanation for absence was requested by us of a member of District Council, we were informed, ‘The legislation is in place. There is no need for a new committee. If people want to improve their resources, the forms are there for them to make an application to the appropriate authority’ (pers. comm.).

Interpreting the specific meaning of this response is difficult. Taken at face-value, it may be true. However, there are numerous unstated factors at play whose influence should not be underestimated.

- Standard operating procedures (SOP) are perceived to be sufficient for poor people in remote areas, most of whom are members of subordinate tribal groups.
- Changing SOP will not affect the economic or political status of dominant actors so incentive is lacking.
- The HOORC is often perceived by government as an organization standing in the way of ‘progress’ (in Allan’s terms, a 5th paradigm entity seeking to influence 2nd paradigm preferences).

At the same time, the research team itself is hampered by several factors:

- Limited mobility (the basin is small by River Basin standards, but the limited road network and availability of project vehicles hinders regular access to key actors; in addition, the most important decision-makers are located 1000 km away from the project site, in the capital city Gaborone).
- Local preferences for face-to-face communication (as opposed to haphazard and sporadic email linkages with government offices; and occasional telephone contact with relevant actors in the basin).
- Need to use Setswana as the primary language of meetings (many villagers do not speak English at all, so making all meetings slow and cumbersome).
- Low levels of education in the area limit the utility of specialized scientific language and methods of information dissemination, e.g. graphs, tables, GIS imaging (so making it harder to influence thinking with empirical evidence).

These factors, taken together, hinder the ability of the research team to build, strengthen and maintain a consensus among all relevant stakeholders as to the utility of a River Basin Committee (RBC). Popular misconceptions (e.g. regarding the change in the river’s flow regime through time) are difficult to displace with scientific explanations. The persistence of these misconceptions (e.g. that people upstream are taking the water) makes it difficult to overcome abiding prejudices. Local actors from the villages lack time, money, communications technology, and mobility so dialogue among residents in the basin is more difficult than that between the research team and individual villages and settlements. Villagers are also used to being consulted through the ODMP process, but have low expectations regarding results because government has a long history of ignoring their expressed interests and using the *kgotla* as a means not to discuss but to inform (see Kgomosto and Swatuk, 2006).

Local government officials, based in Maun, are under-resourced and over-worked. They therefore have particular preferences for action, among which is not included anything that seeks to alter SOPs. The project, thus, has moved in a start-stop-start fashion through its first two years, and the artificial end-point as set out

by the donors (external to the region altogether) suggests that time is too short to achieve the ideal outcome of a functioning empowered RBC.

6.3.1. Making necessary adjustments

As an iterative activity with a four-year time-frame, the project relies heavily on constructing an appropriate dialogue framework. Planned activities include cooperating with the DEA, and NGOs to take Boteti River Forum representatives into the upstream Okavango Delta in an effort to dispel myths of upstream water off-takes or deliberate flow blockages. Many of the villagers have memory of river flow two or three decades ago and continue to hope that government will dredge the Delta such that water will flow again throughout the Boteti River. Given Central Government’s commitment to maintaining the Okavango Delta as a ‘wetland of international importance’ (through adherence to the Ramsar Convention), this simply will not happen. People will have to get used to the idea of living better within their resource base and accepting abiding limitations. This means improving the management of the resources that they now have. It is not the intention of our project to tell them how they must do this; rather, it is the project’s intention to assist them to find their own way forward.

The project continues to pursue action-research in the hope that having better information regarding the state of the resource base may lead to better resource management practice. The project will continue to ‘move people around’ (to twist Conca’s observation regarding managing rivers) in the hope that facilitated dialogue will help build a sense of common purpose throughout the Basin and among all stakeholders (key government actors in Maun and Gaborone included).

7. Conclusions

There remains a powerful disjuncture between the globally-derived and disseminated ideals of IWRM as formulated by a privileged cohort of experts and interested state/non-state actors and the realities of water management at the very local level of the resource itself. The GWP IWRM toolbox offers little guidance for those of us active both at village level, and at the interstices of competing sites and forms of political, economic, cultural and social power. In moving forward with this particular project, we cannot help but conclude that the ideal of IWRM, hammered out at global level, has been parachuted into and rests lightly upon a complex local setting with nested social practices not easily given to amendment or displacement. It is clear that the globally accepted notion of ‘subsidiarity’ (management at the lowest appropriate level) resonates well with rural people at the level of the resource: they aspire to more and better control over their resource base. However, it is not clear how to involve disinterested, and/or overwhelmed and under-resourced regional and national actors where either their own needs are unaffected, or their social status and power is challenged by new practices. Nevertheless, we remain supportive of both IWRM goals and the specific objectives of the project. To move forward we make the following recommendations:

- Project managers must demonstrate adaptive capacity – i.e. an ability to alter methods when and where necessary.
- Rather than adopt an ‘IWRM template’, project managers must be ready to pursue IWRM ‘in parts’, moving forward when and where possible (cf. Swatuk, 2005c; Funke et al., 2007).
- Funding agencies must be willing to set reasonable short-term goals and provide financial support for the long term – positive change is difficult to achieve in the short term, particularly in remote rural social settings.

- Project managers much remain in constant contact with key basin actors, building trust and reaffirming goals.
- Project managers must resist the desire to engage in ‘interesting research’; rather, research should complement the goals of the project and strengthen local people’s capacity for positive outcome decision-making.

Lastly, this project is not unique (see Manning and Seely, 2005; Amakali and Shixwameni, 2003; Botes et al., 2003); neither are the challenges it faces restricted to the Boteti River. It is the feeling of the authors that the lessons learned in the Boteti will have relevance to similar projects undertaken throughout river basins in the developing world.

References

- Allan, T., 2003. IWRM/IWRAM: a new sanctioned discourse? Occasional Paper 50, SOAS Water Issues Study Group, University of London, April.
- Amakali, M., Shixwameni, L., 2003. River basin management in Namibia. *Physics and Chemistry of the Earth* 28, 1055–1062.
- Arntzen, J., Chanda, R., Nkambwe, M., Ringrose, S., Sefe, F.T.K., Vanderpost, C., 1994. Desertification and possible solutions in the mid-Boteti River area: a Botswana case study for the intergovernmental convention to combat desertification (INCD). Final report volume 1: the desertification process and its impacts. Ministry of Agriculture, Gaborone.
- Beck, U., 1995. *Ecological Politics in an Age of Risk*. Polity Press, Cambridge.
- Bethune, S., Amakali, M., Roberts, K., 2005. Review of Namibian legislation and policies pertinent to environmental flows. *Physics and Chemistry of the Earth* 30, 894–902.
- Botes, A., Henderson, J., Nakale, T., Nantanga, K., Schachtschneider, K., Seely, M., 2003. Ephemeral rivers and their development: testing an approach to basin management committees on the Kuiseb River, Namibia. *Physics and Chemistry of the Earth* 28, 853–858.
- Broch Due, V. (Ed.), 2000. *Producing Poverty and Nature in Africa*. Uppsala, NAI.
- Central Statistics Office (CSO), 2002. National population and housing census 2001. Ministry of Finance and Development Planning, Gaborone.
- Central Statistics Office (CSO), 2006. Statistics update: a selection of the latest statistics. Central Statistics Office, Gaborone. <<http://www.cso.gov.bw/statsup/foremar06.html>> (accessed 24.03.07.).
- Conca, Ken, 2006. *Governing Water*. MIT Press, Cambridge.
- Funke, N., Oelofse, S.H.H., Hattingh, J., Ashton, P.J., Turton, A.R., 2007. IWRM in developing countries: lessons from the Mhlatuze catchment in South Africa. *Physics and Chemistry of the Earth* 32, 1237–1245.
- Gupta, J., van der Zaag, P., 2006. Inter-basin water transfers and integrated water resources management; where engineering, science and society interlock. *Geophysical Research Abstracts*, 8 (paper unpublished).
- Margaret, Keck, Sikkink, Kathryn, 1998. *Activists Beyond Borders: Advocacy Networks in International Politics*. Cornell University Press, Ithaca.
- Kgomotso, P.K., Swatuk, L.A., 2006. Access to water and related resources in Ngamiland, Botswana: toward a more critical perspective and sustainable approach. *Physics and Chemistry of the Earth* 31, 659–668.
- Manning, N., Seely, M., 2005. Forum for integrated management (FIRM) in ephemeral basins: putting communities at the centre of the basin management process. *Physics and Chemistry of the Earth* 30, 886–893.
- ODMP (Okavango Delta Management Plan), 2005. Okavango Delta Management Plan: Executive Summary. mimeo, Gaborone.
- Postel, Sandra, 1999. *Pillar of Sand: Can the Irrigation Miracle Last?* Worldwatch Institute, Washington.
- Reisner, Marc, 1993. *Cadillac Desert*. Penguin, Harmondsworth.
- Republic of Botswana, 2005. *Agricultural Statistics*. Department of Animal Health and Production, Ministry of Agriculture. Government Printers, Gaborone.
- Republic of Botswana, 2003. National development plan 9, 2003/04–2008/09. Ministry of Finance and Development Planning. Government Printers, Gaborone.
- Republic of Botswana, 2002. Environmental appraisal for the construction of game proof fence around Makgadikgadi Pans National Park. Draft final Report. Department of Wildlife and National Parks.
- Republic of Botswana, 2001. Ground water resources investigation in the Boteti area. Draft inception report. Ministry of Minerals, Energy and Water Affairs, Department of Water Affairs, Gaborone.
- Shaw, P., 1985. The desiccation of Lake Ngami: an historical perspective. *The Geographical Journal* 151 (3), 318–326.
- Solanes, Gonzales-Villareal, 1999. The Dublin Principles for Water as Reflected in a Comparative Assessment of Institutional and Legal Arrangements for Integrated Water Resources Management. GWP Technical Paper. GWP, Stockholm.
- Swatuk, Larry A., 2005a. ‘Whose values matter most? Water and resource governance in the Okavango River Basin’. In: Sigfried Demuth, Peter Croll (Eds), *The Value of Water – Different Approaches in Transboundary Water Management* (Bonn and Koblenz: BICC and IHP/HWRP, 2005), pp. 57–70.
- Swatuk, Larry A., 2005b. From ‘Project’ to ‘Context’: community based natural resource management in Botswana. *Global Environmental Politics* 5 (3), 95–124. August.
- Swatuk, L.A., 2005c. Political challenges to implementing IWRM in Southern Africa. *Physics and Chemistry of the Earth* 30, 872–880.
- Swatuk, L.A., Rahm, D., 2004. Integrating policy, disintegrating practice: water resources management in Botswana. *Physics and Chemistry of the Earth* 29, 1357–1364.
- Swatuk, L.A., Kgomotso, P.K., 2007. ‘The challenges of supplying water to small, scattered communities in the Lower Okavango Basin, Ngamiland, Botswana: an evaluation of government policy and performance. *Physics and Chemistry of the Earth* 32, 1264–1274.
- Vanderpost, C., 1995. Population change and environmental problems in the mid-Boteti region of Botswana. *Geo-journal* 35 (4), 521–529.