

Southern African Water Conflicts: Are they Inevitable or Preventable?

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Abstract

The rhetorical question posed in the title to this paper reflects the concern felt by large numbers of individuals and institutions in southern Africa. In the past, several different types of conflicts and disputes have occurred in or near to water; there is little doubt that many of these conflicts will continue to occur in the future. However, despite the escalating demands and pressures that continue to be placed on our finite water resources, it is highly unlikely that full-scale military conflict – a so-called ‘water war’ – will ever occur in southern Africa.

The role of water in virtually all of the water-related conflicts that have occurred in southern Africa, has been secondary to considerations of territorial sovereignty. In most cases, these disputes have been driven by perceptions that the territorial integrity or sovereignty of one country, is compromised or threatened by the claims of a neighbouring territory. Many of the international boundaries in southern Africa are aligned with rivers and water courses; the locations of these boundaries are the legacies of surveys and treaties conducted by earlier colonial powers. However, because rivers

are dynamic systems that frequently change their courses in response to flood events, we can anticipate future disputes over the precise locations of international boundaries when rivers change their shape and configuration.

We can also anticipate that almost all future disputes or conflicts involving water, or concerned with some aspect of water, will tend to be local in scale. These conflicts will be amenable to institutional and government intervention, and the rights and responsibilities of individuals are well protected in national legislation. At the international scale of a water-based conflict or dispute between two or more countries, some principles of international law provide a solid foundation for negotiation and arbitration. However, it is clearly in the interests of individuals and societies that appropriate national and international institutions should jointly develop management plans for shared river basins, and also derive workable protocols that can be used to prevent water-based conflicts in the region.

Introduction

In recent years there has been a rapid worldwide increase in public awareness of the fact that the world's fresh water supplies are a scarce and limited resource which is extraordinarily vulnerable to human activities (Falkenmark 1989; Biswas 1993; Glick 1993; Homer-Dixon & Percival 1996; Delli Priscoli 1998). This awareness is coupled with the growing realisation that it is becoming increasingly difficult, and expensive, to provide sufficient supplies of wholesome water to meet the growing needs of communities and countries. These tensions are accentuated by widespread population growth, as well as increased rates of urbanisation and industrialisation (van Wyk 1998). As a result, there has been a dramatic increase in the level of competition for water between different water use sectors. Whilst it appears clear that the basic reasons for increasing water shortages are well understood by all participants, much of the debate is still coloured by strong national concerns over sovereignty and territorial integrity issues (*Business Report* 1998). As a result, the potential for 'water-based conflicts' to occur will continue to remain high, and tensions will be increase – possibly to critical levels – when such countries experience extreme climatic events, such as droughts (Hudson 1996; Glick 1998).

It is understandable that the potential for conflict over water is likely to be most acute in those regions where water is scarcest. Where conditions of

water scarcity happen to coincide with economic, ideological or other differences between countries, we can anticipate that tensions can rapidly reach crisis levels. Indeed, many small- and large-scale conflicts have been based on, or accentuated by, situations related to access to water in the arid regions of the world (Falkenmark 1994). However, there is also a rapidly growing public awareness that water interdependence is already, or will soon become, a fact of life in many countries. Consequently, there is a growing drive towards cooperative development of water resources in certain areas (Delli Priscoli 1998). It has been estimated that about 40% of the world's population live in approximately 200 shared river basins; five or more riparian countries share 13 of the world's major river basins. Whilst these situations provide ideal incentives for riparian countries to jointly develop collaborative actions to safeguard water supplies, such situations can also become the sites for escalating tensions between such countries (Rosegrant 1995; 1997; Wolf 1996).

Southern Africa is largely an arid to semi-arid region, where the basins of most of the larger perennial rivers are shared by between three to eight countries (SARDC 1994). Supplies of fresh water are finite and the existing demands for water in some parts of the region are fast approaching the limits of conventional technologies (SADC-ELMS 1996). Demands for additional supplies of fresh water will need to be met through the use of unconventional technologies, the exploitation of new or novel sources of fresh water, or through the long distance transfer of ever-larger quantities of water from regions that have ample supplies (Conley 1995, 1996). In the future, concerted attention will also have to be paid to reducing the demand for water, and to increasing the efficiency with which water is used (Hudson 1996).

Against this current background of rising demands for water, and the finite supplies that are available, it is important to remember that the national boundaries of all southern African countries seldom follow even a portion of the 'natural' boundary of river catchments (Pallett 1997; Fisch 1999). This last element represents part of the legacy of earlier colonial administrations, where the national boundaries of most countries appear to have been delimited or drawn up in an apparently arbitrary fashion (von Moltke 1977; Prescott 1979; Hangula 1993). Consequently, the extent to which the larger river systems are shared by more than one country has often resulted in intense rivalry between countries, as each strives to derive maximum benefits from the available water resources. Typically, 'downstream' countries are more vulnerable than their 'upstream' neighbours in such situations, and therefore derive the least benefit. This situation has been accentuated in



those situations where the downstream countries may be economically 'poorer' or politically and militarily 'weaker' than their upstream neighbours (van Wyk 1998).

Recent political developments in southern Africa have been accompanied by a wider, regional acceptance of the need for all countries to work together, to develop and implement joint strategies and protocols for the protection and management of regional water resources (SADC-ELMS 1996; Republic of South Africa 1998). However, whilst these welcome developments must be supported and promoted throughout the region, there remain several small- and large-scale issues that have already led to some form of conflict, or hold the potential to do so (Hangula 1993). In these situations, it would appear that despite the best intentions of politicians and water resource managers, some form of 'water-based conflict' is either inevitable or 'unstoppable'. Consequently, it is crucially important that water resource managers examine these situations closely to determine whether or not these conflicts are indeed inevitable, or if they are amenable to some form of preventive intervention.

The concept of 'water conflicts'

It is perhaps not surprising that the English words 'river' and 'rival' are derived from the same Latin root, *rivalis* — he who uses the same stream (Biswas 1993; Ohlsson 1995a). This is also reflected in the conscious realisation that various degrees of disagreement or conflict between individuals, communities and countries have arisen from, or are related to, competition for access to water (Ohlsson 1995b). Such animosities are ancient in origin and continue to the present day. Historical examples from Biblical times tell of how irrigation-based civilisations were vulnerable to invading armies; later, Crusader forces were defeated by Saladin, who denied them access to water. In more recent conflicts, desalination plants and irrigation water distribution systems were systematically targeted in the Gulf War (Delli Priscoli 1998).

Much of the recent debate around existing water conflicts, and perceptions of possible future conflicts, has been phrased in highly dramatised terms of 'water wars' or 'water crises', or other similar doomsday prophesies (Delli Priscoli 1998). Unfortunately, a considerable proportion of the debate has centred on existing or impending problems, whilst very little attention is paid to finding solutions to these problems. On a more positive note, however,

the resulting increase in public consciousness of the importance of water issues is to be welcomed. Nevertheless, it is also true that many of the emotively worded appeals or pronouncements often cause public fear or a pervasive sense of pessimism; the undertones of the debate are disturbing. In many cases, critics create the perception that government departments and water resource managers have either 'ignored the signs' (clearly visible to these knowledgeable and far-sighted individuals) or, worse, concealed them. Such critics sometimes also suggest that these officials have 'only just woken up' and realised that there may be a water-related problem in their area of jurisdiction. Such indictments of past actions or motivations, based on current knowledge, do not encourage constructive dialogue, nor do they promote or support a concerted search for effective solutions (Delli Priscoli 1998).

As already mentioned, water-related conflicts of varying degrees of intensity and spatial scale have existed for millennia; many of the contributing reasons or causes for these conflicts continue today and, undoubtedly, will continue to exist in the future. How we deal with these situations — and we will have to deal with them — will depend largely on the ways in which we interact with our neighbours, and the ways in which we, jointly, harness information and knowledge to derive appropriate, mutually-beneficial solutions. The responsibilities we face are enormous; a pervading sense of pessimism will not help us to achieve success. We simply cannot afford to sit back, wait, and do nothing, in the fatalistic anticipation that some improbable 'better option' will show itself. The scale and urgency of many of the water-related problems we face today demand that we implement proactive approaches now; any further delay will exacerbate these problems.

Our combined awareness of the social, economic, political and ecological causes and implications of these conflicts has improved gradually with time, as more and more information has become available. Globally, we are now in an ideal position to share our knowledge and understanding of these problems, and search for effective, long-lasting solutions. It is important to remember that the English word 'crisis', derived from the Greek root *krisis*, refers more to decision — a time of opportunity and decisive action — rather than a disaster. Consequently, the word crisis should rather be seen in the form of a 'wake up' call for decision and action (Delli Priscoli 1998). It is this form of the concept that should be the basis for our understanding and management of 'water crises' or 'water conflicts'.

In its simplest and broadest sense, the term 'water conflict' has been used to describe any disagreement or dispute over or about water, where



social, economic, legal, political or military intervention has been needed, or will be required, to resolve the problem. Clearly, this broad definition spans a wide continuum of possible circumstances and situations. The simplest example of these might involve the relatively low-intensity dispute over stock watering rights between two adjacent landowners. A structured process of problem-solving could easily resolve such a situation. At the other extreme, a typical example could consist of a relatively high-intensity interaction between two countries, both of whom dispute the 'rights' of the other to a particular proportion of the flow in a shared river basin. Here, failure to reach mutual agreement could result in military intervention, and may even require the involvement of an independent arbitrator. In both types of examples, geographical variations on the theme could also further complicate matters.

We have seen some of the elements of the broad range of possible types of conflicts that can be associated with, or driven by, water. It is important to understand that water is in fact 'incidental' in many of these conflicts and is not the primary cause, objective or 'driver' of the conflict. Perhaps this can best be explained by a series of three simple examples where the 'level' of conflict over water escalates from a situation where water is incidental to the conflict, up to a point where water is either the primary 'weapon of war', or the primary target of the conflict.

The first example would include a situation where a water course forms the national boundary between two countries. If a conflict occurs over territorial sovereignty, and this happens to result in military action in and around the 'border' waterway, this situation can be considered to be a water-related conflict, but not a 'water war'. In the second example, water supply infrastructure and hydraulic installations have often been considered as legitimate targets for aggressive action during conflict between two countries. Here, again, water is not the primary reason for the conflict, though the damage to water infrastructure may be used as a means to inflict hardship on an opponent. For our final example, we can define a 'water war' as one that is fought with the sole or primary purpose of gaining access to water, or where water forms the central weapon of offence in the arsenal of an aggressor. There is ample supporting evidence (e.g. Kirmani 1990; Khroda 1996; Wolf 1996; Pallett 1997; Turton 1999; 2000) that, despite the dire predictions of many authors (e.g. Homer-Dixon & Percival 1996; Hudson 1996), 'true' water wars appear to have occurred very rarely, if at all. Therefore, for our purposes, the broader term 'water conflict' is used to cover the wide range of water-related conflicts that have already been recorded; unfortunately, we also

should be in no doubt that many of these 'lesser' conflicts will continue to occur in the future.

Importantly, the term 'water conflict' is not meant to cover a situation of conflict that, by chance, happens to occur at or near a water source. As Delli Priscoli (1998) has noted, several people happened to 'have been killed around the water hole'. In reality, however, there seems to be a general reluctance to do this, since such incidents of interpersonal violence can rapidly escalate into a national or international issue. Somehow, a shared realisation of the fundamental value and importance of water in such situations of conflict, forces us to elevate ourselves from familiar interpersonal adversarial positions, into positions where our stance is based more on our awareness of, or is related to, the life-giving properties and values of water. In effect, this realisation seems to be based on an awareness that everyone suffers when water is used to make war.

The enormous volume of information available to us at the present time, provides us with a remarkable degree of understanding of the primary causes of water conflicts. Similarly, we are now far more aware of the options and actions that are available to prevent conflicts from happening, as well as how to resolve them peaceably once they have been initiated. To achieve this goal of preventing or resolving water conflicts in southern Africa, it is important that we first examine our understanding of the basic causes of water conflict.

Some causes of water conflicts

Water has long been recognised as critical for human health and well-being; social and economic development cannot take place without adequate supplies of wholesome fresh water (Falkenmark 1989; Delli Priscoli 1996). In the arid and semi-arid regions of southern Africa, fresh water supplies are widely seen as the one resource that has the greatest potential to retard or halt national development programmes (Falkenmark 1989; SARDC 1994; Conley 1995; Mutembwa 1996; Pallett 1997; Heyns et al 1998).

Water is a classical case of a 'fugitive' resource that moves naturally from one area to another, and is transformed rapidly from one state to another. In addition, whilst water is widely seen as a 'renewable resource', reality dictates that there is only a finite quantity of water available in the sub-continent (Conley 1995; 1996; Heyns et al 1998).

Water is also extraordinarily vulnerable to human activities. Both



ground water and surface waters are easily polluted when effluent is discharged; sometimes the adverse effects of such incidents can persist for decades. In turn, this can adversely affect both the integrity of the receiving (aquatic) system, as well as the degree to which other water users might make use of the water. Against this background, it is almost impossible to define the ownership of water, and water is now universally recognised as a 'common good' that should not be 'privately owned'. This principle forms the basis of newly promulgated national water resource management approaches in South Africa, which focus on all aspects of the water cycle within the geographical bounds of a river basin or catchment area (Asmal 1998; Republic of South Africa 1998).

The realisation that water is a critically important resource is not new; indeed, our increasing awareness of the strategic importance of water fuelled most of the water resource development activities of the last century. This has also driven attempts to 'trap' water, so as to provide assured supplies during seasons when water is not easily available. This increased awareness has also led to the transfer of water from areas of ample supply, to areas where water is in short supply (Ashton & Manley 1999). However, the current reality of southern Africa is one of expanding populations, with its accompanying escalation in urbanisation and industrialisation, as well as rapidly increasing demands for water to redress past iniquities. Given this set of circumstances, we cannot continue as we have done in the past and irresponsibly exploit the finite quantities of fresh water that are available in the region. Instead, we need to re-examine the ways in which we derive value from our use of water. Then we need to implement policies and practices that will ensure our use of water resources is equitable and sustainable. This philosophy is directly analogous to equating effective water resource management with good governance (Asmal 1998).

In its widest sense, water is a critical component of the national prosperity of a country. This is because water is inextricably woven into irrigation and food production processes, as well as the provision of energy and, occasionally, to transportation systems (van Wyk 1998). Access to adequate water supplies is usually seen as a 'life or death' issue; any threat to disrupt or prevent access to essential water supplies becomes an emotionally charged and volatile topic of intense debate (*Pretoria News* 1998; 1999a; 1999b). In extreme cases, the confrontation between competing parties can escalate to overt violence (in the case of individuals or communities), or to military confrontation and, more rarely, to armed conflict, in the case of countries

(Falkenmark 1994; Homer-Dixon & Percival 1996).

At a strategic level, five key geographical and geo-political characteristics influence the ease with which water can become a source of strategic rivalry or confrontation between neighbouring states. The first four of these have previously been stated by Glieck (1998); the fifth is added here as an important determinant in Africa:

- The degree of water scarcity that already exists in the region;
- The extent to which a water supply is shared by one or more states/regions;
- The relative power relationships that exist between water-sharing states;
- The availability and accessibility of alternative water sources; and
- The degree to which a particular country's international boundaries are aligned with, or located along, shared river systems.

The outcome of this situation is then framed within the context of the strategic goals and objectives that each country has set for itself. In particular, two closely interrelated aspects are important here:

- First, the degree of attention or effort that each country is willing to focus on actions designed to maintain its territorial integrity or national sovereignty, and the circumstances and costs that it is prepared to bear to achieve this aim; and
- Secondly, the political, social and economic lengths to which each country is prepared to go to achieve a state of national 'resource security' in terms of achieving national self-sufficiency of water, food and energy supplies, rather than developing a more pragmatic, regional, and shared perspective with its neighbours.

We are all keenly aware that a river knows no boundaries; whatever happens to a river at one point will be transported, transformed and expressed along its entire length, until it reaches the ocean. Where human activities divert or interrupt the flow of water, or cause degradation in water quality, the consequences are always attenuated, translated and transmitted downstream. As very few rivers – other than relatively small systems – are contained within the borders of a single country or state, access to wholesome supplies of water increasingly becomes a source of potential conflict whenever a river crosses an international boundary. This issue becomes particularly acute in southern Africa, where water resources are unevenly distributed, and where a



single river system may traverse or form several international borders (Pallett 1996; *Business Report* 1998; Heyns et al 1998). The potential for conflict in such situations is brought sharply into focus in the case of a country that obtains the major proportion of its fresh water supplies from outside its national borders. Botswana, for example, obtains 94% of its fresh water from neighbouring states; this undoubtedly contributes to Botswana's sense of vulnerability (SARDC 1994).

This type of situation is further compounded by large seasonal variations in flow, as well as periodic droughts and floods. In some cases, the uneven spatial distribution of water supplies has also promoted international trade in water; Lesotho is a case in point, earning valuable foreign exchange from the water it sells to South Africa. However, in the context of 'water trading', it is important to realise that there appears to be no shared understanding or agreement as to the value of water; it is usually treated as a 'migrant' resource with a variable value (van Wyk, 1998). The absence of an agreed system for valuing water also contributes to potential conflicts between neighbouring states. The value of water may also vary with its availability. During floods, for example, the unit value of abundant water supplies is considerably less than an equivalent unit of water that is available during a drought.

An additional complicating factor arises when a river system forms the boundary between neighbouring states. Seasonal changes in flow can alter the shape and position of a river channel within a river valley; this can result in year-to-year changes in the 'apparent' geographical position of a boundary. Where specific human activities are associated with the 'original' river channel (for example, traditional grazing rights on islands or the dredging of riverine mineral deposits), any alteration in the position of the river and its associated international boundary can lead to conflict.

To this 'international' dimension of the potential causes of water conflict, we can also add a wide variety of more local, inter- and intra-community conflicts over water that can occur within the boundaries of a single community or country. Perhaps the most frequently encountered of these smaller-scale conflicts relates to water quality problems that result from upstream activities. Problems of access to water during critical periods is another important example of a smaller-scale conflict. In addition, members of the public have expressed a growing need to be involved in decisions regarding water-related issues which may affect their lives and livelihoods (van Wyk 1998; *Pretoria News* 1999a). Failure to provide opportunities for appropriate levels of public

participation has led to several instances where the general public have openly expressed their dissatisfaction and, in extreme cases, rejected proposals for water infrastructure projects. Such cases can also be considered as 'water-related' conflicts.

The issues of scale

In the earlier descriptions of the varied causes of water-related conflict in southern Africa, we briefly touched on the issues of spatial and temporal scales. It is important to note that these (spatial and temporal) scales of water conflict can exert enormous influence on decision-makers who are searching for appropriate solutions (*Pretoria News* 1998, 1999b). Consequently, it is appropriate that we should consider them here, so that their importance can be properly contextualised in the debate surrounding the potential for water-based conflicts in southern Africa.

Clearly, scale issues should play an important role in the decisions taken by water resource managers and politicians. For example, a local-scale conflict between two adjacent landowners over access to water, would require far less strategic (government-level) intervention than another water access problem that may be confounded by a territorial dispute over the precise location of an international boundary. Nevertheless, it is important to remember that smaller, 'local-scale' conflict situations can develop very rapidly and require appropriately rapid responses. In contrast, most larger-scale, or 'international', conflicts tend to develop more gradually; and responses to these situations should also be appropriate to the scale of the problem confronted.

In terms of geographical scale, we can recognise four separate classes:

- Intra-community, where conflict over some aspect of water occurs between members of the same community;
- Inter-community, representing a slightly larger scale, where all or most of the individuals within each community presents a united front in their dispute or conflict with a neighbouring community;
- Inter-provincial, where groups of communities or local authorities within a single province or regional authority dispute the rights of a neighbouring provincial authority (in the same country) to water that is not located within the geographical area of jurisdiction (e.g. typical of inter-basin water transfers, where 'donor' catchments are



seldom compensated adequately, and 'recipient' catchments reap almost all of the benefits); and

- International, where one country may contest some, or all, of the rights to use water from an aquatic system that it shares with one or more of its neighbours. Typical examples of this type would include so-called riparian rights to rivers that are located on international boundaries, or the situation where a river crosses an international boundary and gives rise to disputes between 'upstream' and 'downstream' countries.

In addition to these strictly spatial scales, geo-political considerations can add a further dimension of conflict to those related to the spatial scales outlined above. Here, typical examples would include:

- Conflicts that arise between 'upstream' and 'downstream' countries as a result of specific activities or demands of one or both of the countries concerned;
- Conflicts that arise when countries dispute the precise location of the international boundaries that separate them and which also coincide with, or are aligned to, rivers or other aquatic systems; and
- Conflicts caused by the natural or artificial 'alteration' of river courses that constitute or demarcate international boundaries between two countries.

The scale of activities carried out by the individual countries concerned, often accentuates these problems of 'geographical' and 'geo-political' scale. For example, if an 'upstream' country operates a large impoundment, this will affect the timing, frequency, duration and quantity of water flow, as well as the corresponding silt loads and water quality that are received by the 'downstream' country. Similarly, effluents discharged by an 'upstream' country can have marked adverse consequences for water users in the 'downstream' country. In addition, natural, flood-induced flows can change the position or shape of a river channel, thereby 'altering' the theoretical position of an international boundary; this can 'benefit' one country, whilst adversely affecting its neighbour.

In order to fully appreciate the complexities that characterise actual and potential water conflicts in southern Africa – as opposed to those that may or may not occur elsewhere in the world – it is essential that we review some of the main geographical and geo-political realities of the region. This will

provide us with an overview of the major driving forces that shape national and regional water resource management policies, as well as the social, economic and political responses that are directed towards specific water conflict situations.

Geographical and geo-political realities

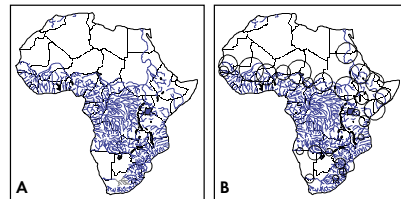


Figure 1. Diagrammatic maps comparing (A) the distribution of larger perennial rivers and lakes in Africa, with (B) the locations of actual or potential water-related conflicts. It is noticeable that rivers form the international boundaries between several African countries

We have already noted that water is unevenly distributed across southern Africa; this is expressed in both spatial and temporal (seasonal and inter-annual) terms. The primary driving forces for this are the steep East-West and North-South gradients in rainfall and evaporation (Falkenmark 1989; Conley 1995). This unequal distribution of rainfall and associated runoff is, in turn, reflected in a striking absence of perennial rivers and lakes in some parts of the sub-continent (Figure 1A). Namibia and Botswana are particularly poorly endowed with perennial rivers. Both countries have to rely almost entirely on the unpredictable supplies of water contained in many small, episodic and ephemeral rivers that flow only after rainfalls. The other alternative is to rely on

perennial rivers that rise outside their borders (Pallett 1986; Heyns et al 1998).

The areas where water-related conflicts have already occurred in Africa – or where local tensions are high and could lead to future conflicts – is shown in Figure 1B. There is a remarkable correspondence between the sites of actual or potential water conflict, and the absence or scarcity of perennial rivers or lakes in Africa. In this discussion, our attention will be focussed on southern Africa.

The so-called colonial 'scramble for Africa' which took place during the last half of the nineteenth century and early twentieth century (Packenham 1991), added yet another dimension to the potential causes of water-related conflicts. In particular, the failure of boundary surveyors to clearly define the exact locations of international borders located along river systems, has resulted in considerable confusion (Hangula 1993; Fisch 1999). This situation was further aggravated by the terms and conditions of border treaties and agreements drawn up by colonial powers as a means of partitioning the African continent, and resolving or satisfying their competing territorial claims. In particular, the Berlin Treaty, drawn up on 1 July 1890, redefined some of the geo-political boundaries between German colonies in southern and eastern Africa, and their neighbouring Portuguese, English and South African counterparts. As a result, the Treaty has left a legacy of problems for successive administrations (Hangula 1993).

With the exception of the Sedudu/Kasikili Island dispute which was recently settled in the International Court of Justice (ICJ 1999), this confusing situation continues to the present day along Namibia's north-eastern Caprivi border with Botswana, involving the Chobe River, as well as the adjacent section of its border with Zambia, involving the Zambezi River (Figure 3; Hangula 1993; Fisch 1999). On attaining independence in 1990, Namibia adopted the principles laid down in Article iii, paragraph 3, of the Charter of the Organisation of African Unity (OAU), which was signed by Heads of States and Governments in 1964. All (OAU) member states pledged to recognise and respect the national boundaries defined by earlier colonial administrations (Hangula 1993). Despite this ratification, border disputes continue to persist in the Caprivi region of Namibia (Hangula 1993; Fisch 1999). The judgement handed down by the International Court of Justice found that Sedudu/Kasikili Island forms part of the sovereign territory of Botswana (ICJ 1999).

A related issue, also involving Namibia, concerns the relocated, 'new' position of the international boundary between South Africa and Namibia,

along the lower Orange River. Here, the original agreement drawn up by Britain and Germany during the nineteenth century, confirmed that the entire lower reaches of the Orange River belonged to South Africa. Subsequently, and in conformance with generally accepted international practice for borders located along rivers, South Africa agreed to 'relocate' this border to the *Thalweg* (the centre of the deepest portion of the river channel). Whilst this move resolved Namibia's problems of access to the Orange River, the action resulted in several unanticipated disputes around alluvial mining rights, grazing rights and offshore fishing rights. These contentious issues, though not strictly 'water conflicts', have arisen as a result of water conflict and remain unresolved to date. Some of their implications are described briefly in the next section of this paper.

The guiding legal principles that underlay the choice of the *Thalweg* as the position of an international boundary, are firmly accepted in international law (ILC 1994; ILA 1996). Nevertheless, it is important to recognise the fact that rivers are dynamic, 'living' systems which continually change the shape and location of their channels over time. Thus, it is inevitable that the precise geographic position of the *Thalweg* will also change with time. This important feature of rivers carries with it the seeds of potential future conflicts between countries where their mutual border is defined solely by the position of the *Thalweg*. A closely related issue is one where the *Thalweg* has not been included in the definition of the border and, instead, the border is merely described as 'the centre of the main river channel'. In such situations, the potential for conflict between countries is greatly enhanced by each natural change that the river undergoes.

Some southern African examples of water-related conflicts

Against the background descriptions and information provided above, it is appropriate that we review a few southern African examples of actual water-related conflicts that have occurred, or potential water conflicts that could soon occur. The few details available for each of the three examples given below have been gleaned from very scanty published information and personal experience in each area. Whilst the information available for each example is clearly incomplete, it does provide us with sufficient insight into the scale and complexities of the respective problems. Specific solutions to each of these three problems will only be attained if all the parties concerned



demonstrate a great deal of tact and diplomacy, as well as a high level of mutual understanding and patience.

Water abstraction from the Okavango River (Angola, Namibia and Botswana)

The Namibian Department of Water Affairs has faced considerable public pressure to relieve the water shortages caused by recent droughts in Namibia. One potential option involved abstraction of some 17 Mm³ of water per year from the Okavango River at Rundu, and its transfer via a 260 km pipeline to the head of the Eastern National Water Carrier (ENWC) at the town of Grootfontein (Heyns 1995; Heyns et al 1998). The general location of the proposed pipeline, and its position relative to the catchment of the Okavango River and Okavango Delta, are shown in Figure 2. A total of three countries comprise the catchment of the Okavango Delta: Angola, Namibia and Botswana. Zimbabwe is part of the subsidiary Nata River system which flows into the Makgadikgadi Pans, and is not considered to form part of the Okavango Delta catchment; consequently, Zimbabwe should not be involved in discussions concerning actions or activities that may affect the Okavango Delta (Figure 2).

The international border between Namibia and Angola is located along the Okavango River, over the deepest portion of the river channel (the *Thalweg*). Thus, both Namibia and Angola maintain that they have a 'riparian right' to abstract water from this section of the Okavango River. However, the proposed water abstraction scheme has raised concern in both Namibia and Botswana. Both countries believe that the scheme could have adverse consequences for the Okavango Delta in Botswana. As a result, it was important to all the countries concerned that the potential environmental impacts of the proposed water abstraction scheme be assessed (Ashton 1999).

Detailed hydrological evaluations of the proposed water abstraction scheme have shown that the scheme represents a reduction of approximately 0.32% in the mean annual flow of the Okavango River at Rundu. The abstraction will also represent 0.17% of the mean annual flow at Mukwe, downstream of the Cuito River confluence. Both quantities are very small when compared with the average annual volume of water that flows down the Okavango River each year (10,000 Mm³ per year; Ashton & Manley 1999). The adverse effects of the scheme would be insignificant along the Okavango River in Namibia, whilst outflows from the lower end of the Okavango Delta to the Thamalakane River in Botswana would be reduced by some

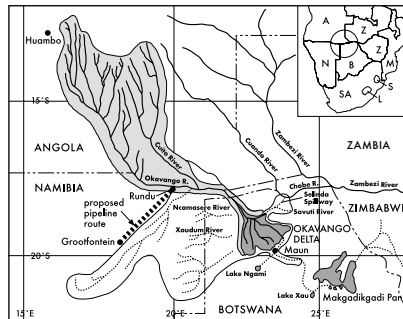


Figure 2. Sketch map of the Okavango River catchment. Detailing the locations of principal rivers and neighbouring countries in relation to the Okavango Delta. The proposed route of the water abstraction pipeline in Namibia is also shown. The shaded portion of the catchment represents the zone which provides surface run-off; the area indicated by the unshaded portion of the catchment appears not to have provided surface run-off in living memory. The subsidiary, seasonal Nata River system flowing into the Makgadikgadi Pans from Zimbabwe is located to the east of the Okavango Delta. (Redrawn from Ashton & Manley 1999)

1.44 Mm³/year (11%). Additional studies have shown that these effects could be reduced by some 10-13% if water abstraction was confined to a six-month period during the falling limb of the hydrograph, instead of continuous (year-round) withdrawal (Ashton & Manley 1999).

Hydrological simulations have shown that the maximum likely loss of inundated area in the Okavango Delta would amount to approximately 7 km²



out of a total area of about 8,000 km². This potential loss in inundated area would be concentrated in the lower reaches of the seasonal swamps grasslands, specifically in the lower reaches of the Boro, Gomoti, Santantadibe and Thoage channels. However, these effects would be expressed as a shoreline effect, with the loss in area spread out along the shoreline and islands, and would not be restricted to a specific area. This anticipated loss in inundated area is unlikely to have measurable impacts on environmental components in any specific area (Ashton & Manley 1999).

In both Namibia and Botswana, the initial public perceptions of the proposed water transfer project were strongly negative (Ashton 1999). The proposed water abstraction was seen as having the potential to adversely affect the tourism industry along the Okavango River in Namibia, and in the Okavango Delta in Botswana, with a possible loss of income for local residents. However, the environmental assessment study found no 'fatal flaws' that would prevent the water abstraction scheme from proceeding. Whilst the anticipated effects are more likely to be seen in the Okavango Delta in Botswana – rather than along the Okavango River in Namibia – the anticipated ecological implications of the scheme were small in spatial extent, and would not be perceptible against the natural year-to-year variability in inundation of the Okavango Delta or outflows to the Thamalakane River (Ashton & Manley 1999).

The overall outcome of the 'technical' evaluations of the anticipated scale, as well as the severity of possible impacts, clearly indicates that the impacts would be very small and, in most areas, would not be measurable by conventional measurement techniques. However, it was also clear to the study team that the public perceptions were shaped by personal opinions, and that there was a relatively widespread rejection of the technical findings (or a refusal to 'believe the facts') which were presented to the public. Therefore, if a decision is finally taken to proceed with the proposed water abstraction scheme, the public are likely to attribute to the project any and all adverse situations or circumstances that may arise, whether these may be caused by the project or by some other set of circumstances, such as global climate change. Clearly, if this project, or any other water abstraction project, does indeed proceed, the governments of each of the basin countries (Angola, Namibia and Botswana) will have to openly demonstrate their support for the project.

Disputed ownership of Sedudu/Kasikili Island in the Chobe River (Namibia and Botswana)

The ownership of Sedudu/Kasikili Island in the Chobe River has been the

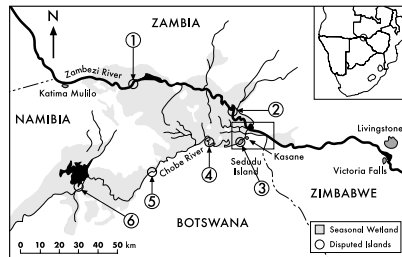


Figure 3. Sketch map of the Eastern Caprivi region of Namibia with the neighbouring territories of Zambia, Zimbabwe and Botswana. The general area of Sedudu/Kasikili Island in relation to the extensive wetland areas is shown. Numbered arrows indicate the locations of the six islands whose ownership is disputed: 1 = Mantungu; 2 = Impalila; 3 = Sedudu/Kasikili; 4 = Kavula; 5 = Lumbo; 6 = Muntungobuswa. The inset box outlines the area around Sedudu/Kasikili Island that is shown in Figure 4

subject of a formal dispute between the governments of Namibia and Botswana since 1996, when both governments agreed to submit their claims for sovereignty of the island to the International Court of Justice (ICJ) in The Hague (ICJ 1999). Prior to this formalisation of the dispute, the 'ownership' of Sedudu/Kasikili Island had been disputed by local residents in Namibia and Botswana, as well as preceding colonial governments. Dispute over the island's ownership dates back to the Berlin Treaty of 1 July 1890 (Hangula 1993; Fisch 1999). A brief outline of the grounds for the dispute has been drawn from the official press communiqué, which announced the International Court of Justice's decision to recognise the territorial claims of Botswana (ICJ 1999). Two sketch maps show the geographical position of Sedudu/Kasikili Island, as well as the locations of other islands whose



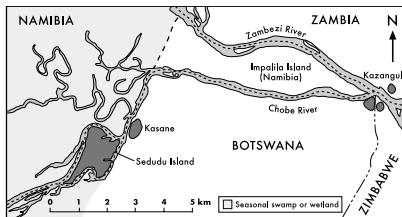


Figure 4. Expanded view of a portion of Figure 3, showing the position of Sedudu/Kasikili Island in relation to the Chobe and Zambezi rivers, as well as the locations of the 'northern' and 'southern' channels of the Chobe River flowing around Sedudu/Kasikili Island

ownership is also disputed (Figure 3). Some details of the local terrain and the positions of river channels surrounding Sedudu/Kasikili Island also feature (Figure 4).

The island known as 'Sedudu' in Botswana and 'Kasikili' in Namibia, is approximately 3.5 km² in area and is located in the Chobe River (Figure 4). The Chobe River divides around the island, flowing to the north and south, and the island is flooded to varying depths for between three and four months each year (usually beginning in March), following seasonal rains (ICJ 1999).

On 29 May 1996, both Namibia and Botswana jointly submitted their cases for territorial sovereignty of Sedudu/Kasikili Island to the ICJ, asking the Court for a ruling based on the principles of International Law (ICJ 1999) and the Anglo-German Berlin Treaty of 1890.

The historical origins of the dispute are contained in the Berlin Treaty of 1890, when the eastern boundaries of the Caprivi Strip were defined in very vague terms as 'the middle of the main channel' of the Chobe River. The Treaty was instituted to separate the spheres of influence of Germany and Great Britain. In the opinion of the ICJ, therefore, the dispute centred on the precise location of the 'main channel'. Botswana contended that this is the

channel running to the north of the island, whilst Namibia contended that the channel to the south of the island was the main channel (Figure 4). Since the terms of the Berlin Treaty did not define the location of the channel, the Court proceeded to determine which of the two channels could properly be considered to be the 'main channel' (ICJ 1999).

In order to achieve this, the ICJ considered both the dimensions (depth and width) of the two channels and the relative volumes of water flowing within these two channels, as well as the bed profile configuration and the navigability of each channel. The Court considered submissions made by both parties, as well as information obtained from *in situ* surveys during different periods of seasonal flow. Against the background of the object and purpose of the Berlin Treaty, as well as the subsequent practices of the parties to the Treaty, the Court found that neither of the two countries had reached any prior agreement as to the interpretation of the Treaty, nor had they reached agreement regarding the application of its provisions (ICJ 1999).

In reaching its verdict, the Court also considered Namibian claims that local Namibian residents from the Caprivi area had periodically occupied Sedudu/Kasikili Island since the beginning of the twentieth century. The Court considered that this occupation could not be seen to reflect the functional act of a state authority, even though Namibia regarded this 'occupation' as a basis for claims of 'historical occupation' of the island. The Court also found that this so-called 'occupation' of the island by Namibian residents, was undertaken with the full knowledge and acceptance of the Botswana authorities and its predecessors (ICJ 1999).

The final Court ruling was given in favour of Botswana, with the ICJ indicating that the northern channel around Sedudu/Kasikili Island would henceforth be considered as the 'main' channel of the Chobe River. Accordingly, the formal boundary between Namibia and Botswana would henceforth be located in the northern channel of the Chobe River. Botswana and Namibia have agreed that craft from both countries will be allowed unimpeded navigation in both the northern and southern channels around Sedudu/Kasikili Island (ICJ 1999).

The ICJ ruling is very welcome after a relatively long period of protracted debate and intermittent threats of military action, including formal military occupation of the island by the Botswana Defence Force. The Sedudu/Kasikili Island dispute provides an excellent example of a water-based conflict situation that reached a high level of tension, preventing resolution of the problem by the disputing parties, thus requiring an



independent third party (the ICJ) to be called in to arbitrate the dispute. However, it is important for us to note that, like all other rivers, the Chobe River is a dynamic system where the shape and position of its channels will change over time. Natural processes of sediment deposition and erosion will continue to occur, each depending on the flow patterns in the river. Consequently, it is inevitable that the Chobe River will continue to gradually alter the position and configuration of its main channel in the future. Future changes in the position or shape of the main channel could possibly become a source of future dispute between the two countries.

In this example, the primary dispute between the two countries is one of territorial sovereignty, rather than one of access to water or water-dependent resources. However, water is the physical driving force for changes to the aquatic system that forms the territorial boundary. Unless these two countries jointly develop a formal protocol to address this type of situation, similar cases of 'water-related conflict' are expected to occur in future.

There are still five islands in the Caprivi sector whose territorial sovereignty or 'ownership' is contested; three of these islands are in the Chobe River and two are in the Zambezi River (Figure 3). Without wishing to pre-empt any options that may be considered by the countries concerned, we can anticipate that the legal principles upon which any decision will be based are likely to follow the same principles and logic used to resolve the dispute over Sedudu/Kasikili Island.

Disputed territorial and other ancillary (water-related) rights along the lower Orange River (Namibia and South Africa)

The dispute between Namibia and South Africa over the lower reaches of the Orange River (Figure 5) has many similar elements to the Sedudu/Kasikili Island dispute between Namibia and Botswana. Once again, the primary issue is territorial sovereignty linked to the precise position of an international boundary, together with the historical 'trajectory' that the boundary dispute has followed.

However, there are several additional problems that centre on access to, or ownership of, resources derived from the Orange River. These are further confounded by the fact that the position of the marine offshore territorial boundary between Namibia and South Africa is dependent on the precise position of the land-based boundary at the river mouth. The Orange River undergoes regular flow cycles, where the river mouth first tends to silt up during low flows, and is then later opened when floods arrive. In the process,

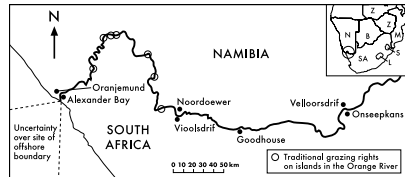


Figure 5. Sketch map showing the lower reaches of the Orange River that forms Namibia's southern boundary with South Africa, together with the locations of towns and the Atlantic Ocean coastline. Circles indicate the approximate positions of islands in the Orange River, where grazing rights are now contested. The scale of uncertainty around the precise location of the offshore (marine) boundary between Namibia and South Africa is also shown

the precise location of the river mouth can change by up to two kilometres in response to the timing or size of both large and small flood events. Clearly, such a situation can pose enormous problems for officials tasked with demarcating national boundaries. Deciding the positions of prospecting leases for the exploitation of offshore minerals such as oil, gas and diamonds, can also be hampered, as well as delimiting the catch areas of commercial fisheries.

Additional complicating factors are provided by the presence of important mineral deposits in the present bed of the river and in alluvial terraces marking earlier positions of the river bed, together with the traditional use of islands in the river as grazing grounds for stock owned by local residents. Since the discovery of diamonds at around the beginning of the twentieth century, large quantities of diamonds have been recovered from mining leases located on alluvial deposits in the present bed of the Orange River, as well as on gravel terraces marking former positions of the riverbed. This situation was considered to be 'manageable' because the boundary between Namibia and South Africa had been set by earlier colonial administrations as the high water mark on the north (Namibian) bank of the Orange River. In effect,



therefore, the entire Orange River formed part of the territory of South Africa.

The lower reaches of the Orange River flow through a region that is predominantly desert or semi-desert, and form a 535 km long linear oasis that also demarcates the boundary between Namibia and South Africa (Figure 5). Very few residents occupy the extremely arid country to the north and south of the Orange River. Those who do manage to live in this relatively inhospitable area are predominantly nomadic pastoralists, who rely heavily on seasonal grazing areas along the riverbanks and on islands located in the river. Expanding mining activities and the development of associated infrastructure in this region have led to dramatic changes in the lifestyles of local residents.

The original colonial powers (Germany and Great Britain) were never able to reach agreement as to the precise location of the territorial boundary between the two countries (Hangula 1993). Great Britain insisted that the boundary should be formed by the 'high water level of the north (Namibian) bank', whilst Germany (naturally) preferred the boundary to be located 'in the centre of the main river channel'. This boundary dispute persisted for decades, despite repeated attempts by both of the original colonial powers and, by the South African Government since 1910, to reach an agreement (Hangula 1993). Local residents on both sides of the river continued to exercise traditional grazing rights and South African miners continued to exploit alluvial diamond deposits in the riverbed. It was only in 1991, shortly after Namibian independence, that South Africa agreed to alter the position of the boundary from the north bank to the centre of the main river channel, to a position overlying the *Thalweg*. Both governments appointed teams of specialists to define the precise position of the boundary line along the river bed (Hangula 1993).

This decision follows the general principles of International Law which govern the position of international boundaries located along river systems. Furthermore, the decision has allowed Namibia to claim its fair share of the resources (water, minerals, land) provided by, or linked to, the Orange River. However, the decision has also resulted in considerable confusion as to the validity of existing alluvial mining leases in the bed of the river, and has denied some local (South African) residents the right to graze their livestock on islands that now form part of Namibian territory. These facets of the dispute will need to be resolved fairly and speedily if the problem is not to become a lingering administrative nightmare. Similarly, it will be essential for the governments of both countries to reach consensus as to the geographical position of the Orange River mouth, so that a mutually acceptable position for

the offshore marine boundary can be demarcated. The rational exploitation of important offshore deposits of oil, gas and diamonds, as well as the important pelagic and benthic fishing grounds, will depend on the successful outcome of these negotiations.

In this example, the primary dispute between the two countries is again one of territorial sovereignty, though it also includes aspects that concern access to water, or resources located within or next to a waterway. Yet again, water is a physical driving force for change (particularly regarding the mouth of the Orange River). This change influences the position of the territorial boundary. Both countries must now jointly develop a formal protocol to address this specific situation, so as to prevent prolonging the present uncertainties.

Are water conflicts inevitable ?

In the preceding discussion we have seen the degree of influence exerted by current geographical and geo-political realities – together with prevailing social and economic trends – in providing conditions that promote water-based conflicts in southern Africa. We have also seen how natural patterns of change in aquatic systems can lead to conflict, or can accentuate existing conflict situations. We should now seek answers to the question: 'Are all or some of these potential water conflicts inevitable?'

Given the evidence presented earlier, the simplest direct answer is an unequivocal 'Yes'. However, this answer depends on several factors which will be expanded on in the next section of this paper. Simply put, and without being pessimistic, water conflicts are inevitable if we continue to do nothing to prevent them from occurring. Whilst this response may appear to be rather simplistic, one must remember the fact that the finite fresh water resources available in the sub-continent cannot continue indefinitely to support the escalating demands that we make of them. Competition for the available water supplies will continue to increase to a point where radical interventions are required. In addition, water conflicts linked to the positions of international borders will still occur in those places where the countries concerned have not yet reached joint agreements.

Whilst water is very unlikely to be the direct *casus belli* of a war in southern Africa (van Wyk 1998; Turton 2000), it is very likely that water will become a contributing factor to regional instability, as demands for water



approach the limits of the available supplies. Inevitably, water conflicts will first occur in those areas where water is in shortest supply; these will then tend to spread further afield, as more and more of the scarce water resources are used directly or transferred further afield to meet rising demands.

In all likelihood, any adverse effects associated with possible global climate changes, such as decreased rainfalls or increased temperatures, will exacerbate the situation. In this context, it is important to understand that these remarks refer principally to the 'minor', smaller-scale forms of water-based conflicts, where few individuals or relatively small spatial areas are involved. In the case of more 'extreme' forms of conflict – such as interpersonal disputes resulting in the death of individuals, or where military intervention escalates to the point where war is declared between two competing countries – they are unlikely to occur as a direct or indirect result of water. If war was declared in such circumstances, water would probably remain a contributing or subsidiary issue, rather than the main cause or 'driving force' of the war. Nevertheless, each country in southern Africa remains concerned about issues of territorial sovereignty and resource security. This is reflected in the recent return of water to state control, as opposed to ownership by individuals (Asmal 1998; Republic of South Africa 1998). However, whilst this trend may reflect the growing strength of individual national governments, the same cannot be said for regional institutional structures. For example, the SADC was unable to resolve the Sedudu/Kasikili Island dispute between Namibia and Botswana, despite specific provisions for dispute resolution contained within the SADC Protocol on Shared River Systems (SADC 1995; van Wyk 1998).

In the light of these observations, we now need to consider some of the potential preventive approaches available to us, so we can properly formulate and implement suitable policies, strategies and actions to avoid the prospect of water-based conflicts, and their consequences, in southern Africa.

Possible preventive measures

We are all aware of the old adage that 'prevention is better than cure'. This common sense statement provides us with a perfect outline of the goals and objectives that should direct our actions when we seek to deal with the complex issues of water-related conflicts. However, despite its apparent simplicity, it seems that this ideal often eludes us in practice. A large part of

the reason for this lies in the diverse, and often contradictory, ways in which we attach value to water, and the ways in which we strive to derive both individual and collective benefit from our use of the resource. Too often our objectives have a short-term focus aimed at meeting objectives and solving problems today, rather than a longer-term goal focussing on the sustainable and equitable use of our water resources.

Clearly, if our demands for water outstrip our ability to manage water as a focus for cooperation and the achievement of common goals, we run the risk of entering an ever-tightening spiral of poverty — the social, economic and environmental consequences of which will threaten the fabric of society. In contrast, if we are able to attain an equitable balance between the demands we make for the services and goods that we derive from the use of water, and our ability to exercise our custodianship of water, we will be able to achieve a far more harmonious and sustainable situation. The second of the two visions outlined above, is clearly one that should have a far greater appeal to wider society. However, in order for us to achieve this, all our policies and actions concerning water must be guided by the values of sustainability, equity, mutual cooperation, and the attainment of optimal benefit for society (Asmal 1998).

Within this philosophical framework based on the concepts of sustainability, we can now briefly outline four of the most appropriate approaches for preventing water conflicts and, in those situations where conflicts have already occurred, approaches that can help to resolve these conflicts before they escalate to unmanageable levels.

Water resource management on a whole-catchment basis

Modern approaches to water resource management recognise that water resources can only be managed effectively and efficiently when the entire river basin or catchment forms the basic management unit. Furthermore, because surface water and ground water are inextricably interlinked, they must be considered and managed together as a single resource. These principles form the foundation for integrated catchment management (ICM), and are rapidly gaining wider acceptance throughout the world (Ashton & MacKay 1996).

Most southern African countries have recognised the fundamental importance of catchment management, and have already drawn up policies, implemented the required legislation, and initiated a series of actions designed to achieve this objective (Asmal 1998). Whilst it will still take some time for the full benefits of these activities to be realised, a promising start



has been made. The cases of water resource management in river basins which are shared by more than one country, and the issue of water transfers between river basins within the same country or between neighbouring countries, still require additional attention.

The thorny issue of river basins shared by more than one country has been central to many water-related conflicts which have occurred in southern Africa. Part of the problem relates to the existence of different political, economic, and social structures within each country; another component of the problem relates to differences in the legal and legislative systems of different countries. Importantly, a critical aspect of the problem also relates to the relative economic and political 'strengths' of each state. Nevertheless, it is inevitable that all countries which share a single river basin will have to jointly decide on appropriate management goals, as well as an equitable basis for allocating water to meet the needs of each riparian state. Clearly, it will then be the responsibility of the individual riparian states to communicate the conditions of such an agreement to all their citizens and water resource managers. If this can be achieved at an early stage, then the joint agreement will provide considerable assistance in preventing or avoiding water-related conflicts. Failure to achieve this will prolong any existing conflicts, and will create conditions that could favour or promote the water 'rights' of one country over another.

In its ideal form, catchment management provides both a guiding philosophy and a practical framework for action which, in turn, promotes cooperative decision-making and responsible management of water resources. A basic tenet of catchment management is the principle that all water users within a catchment must take responsibility for determining the short-, medium- and long-term objectives of water resource management, whilst ensuring that water allocation is both equitable and fair (Asmal 1998).

Consequently, water transfers and linkages within a catchment and, where necessary, between neighbouring catchments, are guided by the decisions made by all stakeholders (Basson et al 1997). Clearly, this represents an ideal that may not yet be attainable because of a variety of problems. Perhaps the most important of these are: ineffective or non-existent water legislation, inappropriate institutional structures, a lack of suitable information and thus an absence of empowerment amongst stakeholders, and finally, a lack of understanding of available participatory approaches for obtaining consensus and resolving disputes. Each of these aspects hold opportunities that can help us prevent or resolve water conflicts. They are described briefly below.

Legal and legislative principles

Each southern African country has legislative frameworks and laws which guide and control the development and management of society. Many of these policies and laws have been inherited from previous colonial administrations, where a form of centralised command and control of key resources (such as water) was of great importance. For the purposes of our discussion, the most important items of legislation in each country are the laws relating to the protection, development, control, use, and management of water resources. Many of these southern African 'water laws' have been modified from their original (colonial) form and now share several common features. Particularly important are those aspects of these laws that recognise water as a common good, denote each state as having a custodial responsibility for water, and replace previous situations of water 'ownership' by individuals with a common 'right to the fair and equitable use of water'.

Whilst some of the principles contained within these legal systems represent a dramatic departure from previous water law, they now provide a far more equitable basis for water allocation and management (e.g. Asmal 1998; Republic of South Africa 1998). Therefore, when the laws are applied effectively by designated officials and agents of the respective governments, the national water legislation within each southern African country provides individuals and communities with an appropriate legal framework within which to seek suitable options to prevent water-related conflicts and disputes.

However, at the international level, matters are somewhat less straightforward. International water law is organised around a core, comprising four main doctrines that attempt to define and delineate the rights of river basin states to use water from a shared river system (Pallett 1997; van Wyk 1998). These principles and laws have evolved at different times and reflect responses to the suites of different claims which have been received from riparian states. Each of the four doctrines reflect different historical and judicial approaches to solving the problems experienced by riparian states (ILA 1966; ILC 1994; van Wyk 1998), and also reflect an important change in emphasis from the rights to ownership of water, to one which strives to ensure that the interests of all parties are met equitably. The four main doctrines of international water law are briefly outlined below.

- *The doctrine of absolute territorial sovereignty*

Also known as the Harmon Doctrine, this consideration maintains that the portion of the water which flows through the sovereign territory of a riparian state is subject to the exclusive sovereignty of that riparian



state. Application of this doctrine within a shared river basin empowers an 'upstream' country to use or modify all of the river flows that originate in, or flow through, its territory, without consideration of the needs or rights of 'downstream' countries. Clearly, the principles of this doctrine must be regarded as being inappropriate, and they certainly do not reflect the realities of international law or whole catchment management.

- *The doctrine of absolute territorial integrity*

The principles of this doctrine instruct riparian states not to interfere with any portion of the natural flow of a river which passes through their territory, if such interference is likely to impact adversely on the flows of water to a 'downstream' country. In addition, 'upstream' countries are not to interfere with any prior use that the 'downstream' country may have made of such flows. This doctrine has particular relevance to those cases where a 'downstream' country relies heavily on flows originating in an 'upstream' country. A classical example of the application of this doctrine is reflected in the demands that Egypt makes of Ethiopia: that Ethiopia should not undertake any water development or use that would reduce flows in the lower Nile River (Smith & Al-Rawahy 1990). If applied, the principles of this doctrine confer an enormous advantage on 'downstream' countries which have already 'developed' their water use. However, the same application will simultaneously cripple 'upstream' developments.

- *The doctrine of limited territorial sovereignty*

The principles of this doctrine assert that the water of an international river cannot be exclusively appropriated by one riparian country; rather, all riparian states must be allowed a reasonable and equitable level of utilisation of an international river. In practice, the application of these principles are considered to be contentious (van Wyk 1998), since the principles of 'equitable apportionment' have been vaguely formulated and no guidance is given as to determining the hierarchy of water users in a shared river.

- *The doctrine of community interest*

The principles of this doctrine attempt to remedy drawbacks that have occurred within the doctrine of limited territorial sovereignty. This is done through expanding the issue of community interest and by

improving the definition of equitable utilisation. This doctrine represents a more balanced approach which seeks to contribute to the joint development of riparian countries within a shared basin. This is achieved through equitable division and sharing of benefits. At the same time the management of water within that basin is also improved.

An unfortunate characteristic of international water law is that it lacks the compulsory jurisdiction and enforcement that normally characterise domestic legal systems. Rather, it relies on its acceptance by the affected states, as well as the world community. The non-navigational use of river systems (e.g. for domestic and industrial consumption), has focused considerable attention on the need for cooperative sharing of water resources throughout the SADC countries (Pallett 1997). This was further emphasised during recent meetings of the SADC Ministers (Heyns 1995).

The basis of modern international water law has developed over many decades, and the most notable achievement was the establishment of the Helsinki Rules on the uses of international rivers (ILA 1996). The principles embodied in these Rules have been expanded into a set of 33 Draft Articles, which assist each basin state in negotiating a reasonable and equitable share of the available water resources (ILC 1994). The Helsinki Rules concentrate on the water rights and obligations of states located within a shared river basin, and contain important principles apply:

- Each basin state, within its own territory, is entitled to a reasonable and equitable share in the beneficial uses of water within an international drainage basin;
- The interests of each basin state should be satisfied, without causing substantial injury to another basin state;
- One basin state may not deny another state the reasonable use of water in an international drainage basin for the purpose of reserving the water for itself; and
- An existing reasonable use may also continue, unless it can be shown that it needs to be changed or stopped to accommodate a more beneficial and urgent use.

The Draft Articles drawn up by the International Law Commission promote the concepts of prior consultation between basin states, and the mutual sharing of data and information in reaching consensus (ILC 1994). An interesting aspect of these Draft Articles is that, in the event of two states



coming into conflict, the obligation not to cause harm to another state prevails over the concept of equitable use, which is stated in the Helsinki Rules. This is based on the argument that the use of water by one state cannot be equitable if it causes harm to another state (ILC 1994).

The Draft Articles further advocate that all states sharing an international river basin should jointly form a river basin management authority or organisation which can equally represent the interests of each state (ILC 1994). This approach has been adopted with great success elsewhere in southern Africa (Pallett 1997), and is the basis for the OKACOM agreement between Angola, Botswana and Namibia (OKACOM 1994).

Development of appropriate institutional structures

At an international level, extensive cooperation exists between southern African states which share international river basins. This has usually taken the form of river basin commissions or Joint Permanent Technical Commissions, where the interests and concerns of each state are presented and debated before decisions are taken. However, whilst these formal commissions and committees are to be welcomed, full regional cooperation and coordination are still inadequate (van Wyk 1998).

In 1995, all but three of the SADC Heads of State signed the SADC Protocol on Shared Watercourse Systems (Heyns 1995). One more country has ratified the protocol, leaving only Mozambique and Zambia. This is an important development, and signifies widespread heightened awareness of the critical importance of water resources to the entire southern African region. The SADC Protocol was followed by a November 1995 meeting of the SADC Ministers responsible for Water Affairs. A new SADC Water Sector was established at the meeting. All of these developments are to be welcomed and it is anticipated that SADC will eventually become a strong regional force in the prevention of water conflicts.

At a national level, catchment management approaches require the formation of institutional structures which can promote the empowerment of participants and allow meaningful participation by all stakeholders. Whilst many of these structures are still in their infancy and have not yet begun to function properly, we can anticipate that they will provide an essential process for defusing conflict situations and preventing water conflicts.

Development of participatory, consensus-seeking approaches

A central component of conflict prevention is a need for the prior development

of suitable participatory processes designed to seek consensus and agreement. In the case of water conflicts, it is important for institutions and countries to have a mutual framework of criteria and agreements to provide the basis for decisions. This also requires widespread agreement on the sharing of information and data, rather than each participant retaining (hoarding) the information it considers to be important (Turton 1999). In turn, this openness will help all participants to understand the sets of rules and constraints within which they need to work, and will also facilitate the joint development of alternative options or solutions to a particular problem or concern. This ability to generate new options is one of the most important keys to successful negotiations (Delli Priscoli 1998).

We are all aware of how important it is for participants in a dispute to reach consensus or agreement wherever possible. However, sometimes this is not possible, since the differences between the parties concerned may remain too far apart to be bridged by a single solution, or a combination of solutions. Whilst this type of situation may be driven by economic or ideological standpoints, rather than differences of opinion over water, the end result is the same: failure to reach joint agreement. In such situations, conflicts can be prevented if an agreed process for independent arbitration to cover this eventuality, has already been selected. Possible solutions in the case of disputes between two or more countries include the International Court of Justice at The Hague, as in the case of the Sedudu/Kasikili Island dispute (ICJ 1999).

Inevitably, individual countries which share the same river basin will have to continue to coexist and use their shared water resources in the future (Ashton & MacKay 1996). It is therefore extremely important for these countries to ensure that suitable institutional structures and administrative processes are in place. This will help them maintain cordial relations with one another, and will also prevent the need to use the rather dissatisfying option of an independent third party or arbitrator to resolve their water conflicts.

Participatory decision-making processes that seek to reach consensus are equally important at the level of individuals and communities. Here, it is also important to ensure that all participants fully understand their roles and responsibilities, and that they are sufficiently empowered to exercise their responsibilities through the provision of information. Ultimately, each person or community has to 'own' and implement the solution that has been derived from their joint deliberations and interactions. This is only possible when each individual also 'owns' the process used to derive these solutions.



Concluding Remarks

In this overview, we have examined some of the factors that cause or promote water conflicts, and we have reviewed a few examples of existing water-related conflicts in southern Africa. Based on the available evidence, we have seen that water conflicts in southern Africa are inevitable, unless we can take appropriate preventive actions. The opinion behind this assertion is fuelled by the continual increase in demands for water, which has a resource base that cannot support indefinitely.

Some of the preventive measures mentioned above have been briefly outlined. These centre primarily on processes of joint decision-making, within suitable institutional and legislative frameworks. It is important to note that the possible options for conflict prevention are generic in nature, but these will have to be customised to make them site-specific, to suit the individual needs of the communities and countries involved.

The issue of the scale of actual or potential conflict is important, as well as the specific circumstances that have given rise to the problem. For example, a river boundary that coincides with, or forms, the international boundary between two countries, has the real potential of becoming a cause of conflict whenever the river changes its position. Similarly, it is clear that 'downstream' countries and communities will always be more vulnerable than 'upstream' countries. In turn, the degree of vulnerability felt by a 'downstream' individual, community or country would be determined by perceptions of the relative economic, social and military strengths of the different parties.

All of the larger-scale southern African examples of water conflict share the characteristic that water may have contributed to the conflict, (for example through the erosive action of a river changing the position of its channel), though it has not been the primary focus for the conflict. Some of the examples also comprise situations where access to other resources (e.g. oil, gas, minerals, grazing land) is compromised by the proximity of these resources to a national boundary whose precise position is disputed. The relatively smaller-scale situations of water-related conflict consist mainly of intra-community and inter-community disputes over access to water, or to services associated with water. These disputes occur usually within a small geographical area and seldom escalate to involve communities from neighbouring countries. Whilst these small-scale conflicts are very real to those involved, and often result in the death of individuals or their livestock, they are not considered to be true water wars in the widely accepted sense of a

military conflict between two or more countries. Their smaller scale makes them more amenable to resolution by peaceful, negotiated means, and the resulting solutions tend to persist because each individual is involved in the resolution process.

We can also conclude that 'true' water wars comprise only those extreme cases where the primary focus is to secure access to water, or where water is the primary offensive weapon. Despite the dire predictions of many authors, the available evidence suggests very strongly that it is highly unlikely that 'true' water wars will ever occur in southern Africa. However, this is no reason for complacency on our part. We all share the responsibility of ensuring that water wars never occur in southern Africa, or elsewhere. We now need to jointly identify those so-called 'hot spots' where water conflicts could arise in future. Then we need to develop joint strategies to defuse these situations. Military confrontation between Namibia and Botswana has already occurred in the case of Sedudu/Kasikili Island; we must ensure that this situation is not repeated.

This responsibility requires each of us to promote the principles of equity and sustainability in all our dealings with water users and water resource managers throughout the southern African region. Similarly, we should seek new ways to influence the relevant water management institutions and authorities to focus their efforts on those longer-term policies, plans and actions which will prevent water conflicts, rather than retaining only a short-term focus and then trying to resolve conflicts after they have occurred. Failure to achieve this is likely to result in an increased number of water-related disputes, with the strong likelihood that their intensity may escalate progressively over time to intolerable levels of conflict between communities and, even worse, between countries.

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Hydropolitical Hotspots in Southern Africa: Will there be a Water War? The Case of the Kunene River

Richard Meissner

'Whiskey is for drinking but water is for fighting over.'

Mark Twain

Introduction

During the 1980s and 1990s, much was written and said about the impending water wars which are expected in semi-arid and arid regions across the globe during the twenty-first century. The hype about this type of conflict has been instilled in the minds of hydropolitisists, and has been made popular by Boutros Boutros-Ghali's statement that: 'The next war in the Middle East will not be over politics but over water'. This led to an escalation of research projects regarding conflict over water resources in the Middle East. Thomas Naff and Ruth Matson (1984), and John Cooley (1984) did the first pioneering studies on the subject of water as a source of conflict and cooperation. Cooley (1984), a news correspondent by profession, looked specifically at the connection between water and conflict. Subsequent studies and articles