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; Gleick 1993; Homer-Dixon & Percival 1996; Delli Priscoli 1996). 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 1996). 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 1990). As a result, the potential for 'water-based conflicts' to occur will continue to remain high, and tensions will be increased – possibly to critical levels – when such conflicts experience extreme climatic events, such as droughts (Hudson 1996; Gleick 1996).

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 1996). 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 delimitated or drawn up in an apparently arbitrary fashion (von Molke 1972; Prescott 1976; 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 1996).

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 (SAIG-ELMS 1996; Republic of South Africa 1996). 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 (Hunegda 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, *rivale* — 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 prophecies (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, mutually-beneficial solutions.

The responsibilities we face are enormous; a pervasive 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 'crises' 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
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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 those 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; Khoeda 1996; Wolf 1996; Bault 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 Deli 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, Deli 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 1993; SARDC 1994; Conley 1995; Mubombu 1996; Bault 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; Heyns et al 1998).

Water is also extraordinarily vulnerable to human activities. Both
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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 lead 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 reduce past injustices. 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; Homes-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 Glick (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
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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 present 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
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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 interannual) 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...
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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 boundary 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 northeastern 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 underlie 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
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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 Mm$^3$/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 Goodfontein (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 Mm$^3$/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 1.4 Mm$^3$/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 km$^2$.
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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 ownership is disputed:

1 = Mantungu; 2 = Impalila; 3 = Sedudu/Kasikili; 4 = Kavula; 5 = Lumbo; 6 = Munungobuswa. The inset box outlines the area around Sedudu/Kasikili Island that is shown in Figure 4.

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

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, Gumeti, Santantadibe and Thaoge 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.
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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 km
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 should 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 operation 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, 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 riverbed. 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,
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therefore, the entire Orange River formed part of the territory of South Africa.
In this example, the primary dispute between the two countries is again
of territorial sovereignty, though it also includes aspects that concern
water as a physical driving force for change (particularly, 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, as well as anticipating and preventing the
present uncertainties.

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 higher water level of the north (Namibian)
bank, whilst Germany (naturally) preferred the boundary to be located ‘in the
centre of the main river channel’. The original boundary dispute persisted for
decades, despite repeated attempts by both of the original colonial powers
to prevent them from occurring. Whilst the evidence presented earlier
implies that the simple direct answer is an unequivocal ‘No’, 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
simple, one must remember the fact that the finite fresh water resources
available in the sub-continent cannot continue indefinitely to support the
current geographical and geo-political realities – together with prevailing
social and economic trends – in providing conditions that promote water-
and, by the South African Government since 1910, to reach an agreement
on islands that now form part of Namibian territory. These facets of the
boundary will need to be resolved fairly and speedily if the problem is not toecome 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 this specific situation is reached.

In the preceding discussion we have even the degree of influence exerted by
current geographical and geopolitical realities – together with prevailing
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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 rainfall 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 in those situations where conflicts have already occurred, approaches that can help to resolve these conflicts before they escalate to unmanageable levels.

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 focusing 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 risk 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 from 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 (ILC 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
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• 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 (Heyne 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.

References


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Introduction

During the 1960s and 1970s, 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 hydropoliticians, 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...
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International political interaction

In international politics, three patterns of interaction can be identified between actors. Firstly, politics may be characterised by competitive interactions. In such a situation, the achievement of goals by one actor is incompatible with the attainment of goals by other actors. The action that can arise from this may vary from a breakdown in communication to outright military confrontation. Secondly, politics may be a reflection of cooperative contact, in which goal achievement is facilitated or promoted by the complementary actions of different political actors. This is usually reflected in collaborative agreements between states and non-state entities. Finally, and most realistically, politics may follow a mix of both cooperative and competitive interactions, in which actors pursue multiple goals, some of which are incompatible and thus give rise to contention, while others are compatible and are sought through complementary endeavours (Puchala 1971:5). In a similar vein, Soroos (1986:6) contends that “world politics is a rich and perplexing mixture of trends and counter-trends”. What this means is that, for any given period of time, conflict and military confrontation can occur alongside cooperation and accommodation (Soroos 1986:6). This is true not only for world politics, but also for the interaction between states in a river basin. The three patterns of interaction that occur within a riparian context – with the third model being the most important – will always be discernible within the dynamics of any river basin.

By analysing the dynamics of the hydropolitical game in a river basin, one is able to measure, over a period of time, the nature and degree of conflict and cooperation within a riparian context. The nature and degree of conflict and cooperation over water varies constantly and is not the same at any given point in time. The sharing of the Orange River by South Africa and Lesotho, for example, caused a great deal of conflict before 1986. The degree of cooperation today is greater than before and may increase further in the immediate future (Meissner 1999). However, there is a flip side to the coin. The overall international relations between states sharing the waters of a river basin, however, offer an indication of the nature and degree of interaction within the riparian context. If state A does not maintain a very good relationship with state B, then it generally follows that their relationship will be found wanting when it comes to the sharing of water resources. Therefore, it follows that in analysing the hydropolitics of a given river – in this case the Kunene River – one should also look at the nature of the relationship between
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themselves have an influence on water resource scarcity, producing either an acute conflict or a cooperative relationship (Elman 1999:6). The physical characteristics of a river basin and the countries sharing it, also explain the relationship between Homo sapiens and the way they utilise their environment. Every political community occupies a geographical area which has a unique combination of location, size, shape, climate and natural resources. These variables influence the behaviour of states. Human activity is affected by the uneven distribution of human and non-human resources in the system (Dougherty & Pfalzgraf 1990:67). Consequently, it is necessary to briefly study the physical characteristics of the Kunene River basin to see why the actors in the basin behave in a certain way.

Physical characteristics of the Kunene River Basin

The Kunene River rises in the central highlands of Angola near Nova Lisboa, where the annual rainfall is in the region of 1,500 millimetres (mm). The river is 1,050 km long and has a catchment area of 110,000 km². Physical characteristics of the Kunene River Basin as well as the countries sharing it. This is important because many intervening variables – like the geographic, climatological and hydrological characteristics of a riparian system and river basin – can themselves have an influence on water resource scarcity, producing either an acute conflict or a cooperative relationship (Elman 1999:6). The physical characteristics of a river basin and the countries sharing it, also explain the relationship between Homo sapiens and the way they utilise their environment. Every political community occupies a geographical area which has a unique combination of location, size, shape, climate and natural resources. These variables influence the behaviour of states. Human activity is affected by the uneven distribution of human and non-human resources in the system (Dougherty & Pfalzgraf 1990:67). Consequently, it is necessary to briefly study the physical characteristics of the Kunene River basin to see why the actors in the basin behave in a certain way.

On the other hand, Angola, with its mostly tropical climate, has a more

bordering states with regard to shared water resources.

As noted above, there are three types of interaction between states in the international political arena. There are also three schools of thought on the issue of water wars: there are those who say that water will one day lead to violent conflict; there are those who say that water will, only on occasion, lead to conflict between states; and there are those who say that water could lead to greater cooperation within and between states. Those who argue that a water war will, in all likelihood occur in semi-arid and arid regions, base their statements on the assumption that water scarcity, the improvement of living standards coupled with population growth, and global climatic changes will contribute to tension and violent conflict between states (Gleick 1995:84). This is the main realist argument by observers writing on the subject of water wars. However, this is not universally accepted. It is easy to exaggerate the importance of natural resources as an object of conflict. A dispute over natural resources seems so frequent, that it can become tempting to regard the competitive demand for water as the single most important cause of conflict and war. This seems to be the case with water resources throughout the world. A dispute or military conflict which involves resources is not necessarily a struggle over resources (Brock 1991:409-410). Water resource depletion is seldom, if ever, the only cause of major conflict within or among states (Holst 1990:126). Interstate conflicts can be caused by a great variety of factors, including ethnic antagonism, ideology, border disputes, expansionist aspirations by states, religion and so on. Therefore, water can be part of the conflict, but not the overriding motive for starting a war. Further, there exists the possibility of cooperation over water as a means to strengthen the overall international relations between nations sharing this resource (Brock 1991:413) Gleick is in concert with this when he says that not all water disputes will lead to war, "indeed most lead to negotiations, discussions, and non-violent solutions". Analysing the water politics of the Kunene River will show that water has never led to violent conflict, and the likelihood that it will, will never occur. An analysis of the hydropolitics will shed some light on the kind of interaction that has historically occurred in the Kunene basin, and which continues to take place.

Before tackling the dynamics of hydropolitics in the Kunene River basin, however, it is important that we first look at the physical characteristics of the river basin, as well as the countries sharing it. This is important because many intervening variables – like the geographic, climatological and hydrological characteristics of a riparian system and river basin – can...
stable rainfall pattern than Namibia. Rainfall decreases from north to south, and also as one moves farther away from the coastal areas. Angola is therefore more water-rich than Namibia. The total water source is about 138 billion cubic meters. However, Angola is only using 0.3% (50 m^3 per capita per year) of its available water resources. It is the lowest abstraction rate in the SADC region (Du Toit & Jacobs 1995:30-31). The country's 26-year-long civil war is solely to blame for this. Having expended all of its resources on the civil war, the government does not have the financial capabilities to develop the country's water sector. Also, much of the water infrastructure has been damaged during the conflict and repairs cannot be made. This is the milieu which forms the background to the hydropolitical game in the Kunene River basin.

The dynamics of water politics in the Kunene River Basin

Owing to the fact that Namibia is not very richly endowed with water resources, the states that had control over Namibia in the past — as well as the present legitimate government — came up with a number of coping strategies which followed adaptive behaviour. Adaptive behaviour is defined as a manifest response to water scarcity and can take any one of a number of forms, perhaps the best example being the undertaking of large water projects to alleviate water scarcity. A coping strategy can be defined as the output of the decision-making elite, usually in the form of some coherent policy or set of strategies such as water demand management, which seeks to manage the water scarcity in some form or another (Tufton & Ohlsson 1999:3). Adaptive behaviour and coping strategies were part of the dynamics of water politics in the Kunene River during the previous century and continue to remain a part of the scenario, usually taking the form of large-scale water projects to step up the supply of water and electricity in different areas of Namibia. For instance, at around the turn of the nineteenth century, the German colonists, Brincker and Gessert, first suggested damming the Kunene River to supply water to Deutsch SüdwestAfrika. Later, when South Africa held sway over Namibia, the development of the Kunene River was undertaken in order to facilitate the overall development of Namibia (Christie 1976:31). Dirk Mudge, South African MEC and acting administrator of Namibia in 1976, held the following view regarding the development of the Kunene River and what it meant for Namibia: "The Kunene scheme is very important, for one just cannot develop these territories without water and electricity. ... We need a strong economy to provide jobs in the southern sector for people from the native homelands. One cannot have a strong economy without infrastructure" (Christie 1976:40, personal interview with D. Mudge).

Owing to the fact that the Kunene River is an international river, it was necessary for the previous entities which controlled Namibia and Angola — as well as for those who do so at present — to come up with some agreement regarding the sharing of the river's water. International agreements and cooperation regarding the waters of the Kunene River formed part of the coping strategies envisaged by Namibia and Angola. However, it was not always plain sailing to develop the Kunene River, because international political factors had (and still have) a profound impact on these projected plans.

From cooperation to conflict: 1926-1988

Cooperation regarding the joint management of the Kunene River can be traced as far back as 1926, when the Union of South Africa and the Republic of Portugal signed an agreement to regulate the use of the Kunene River waters for the purposes of generating power, irrigation and irrigation in the mandated territory of South West Africa (SWA) (Agreement 1990a; Christie 1976:31). Ernest Oppenheimer envisaged that one of his companies would build a dam on the Kunene River to supply the mining industry in SWA/Namibia. At that time, Jan Smuts tried to redraw the Angolan border to include the dam site at Calueque within the territory of South Africa, but he did not succeed. No substantial infrastructural developments were undertaken after the 1926 agreement. However, the Kunene Water Commission undertook a survey in 1927 to investigate the possibility of damming the Kunene and diverting its water into Owamboland (Welling et al. 1931:26). The reason why no development took place at that time was that SWA and Angola were in no great need of water. The ground was, however, prepared for future cooperation.

In 1962, the South Africa government established the Odendaal Commission to investigate a report concerning the socio-economic potential of SWA and the measures to be taken to stimulate the rate of development in that country. The final report of the commission was published in 1964. One of the commission's conclusions was that the waters of the Kunene River should be utilised for the generation of electric power. This kind of development could provide a substantial economic contribution to the accelerated
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In the same year, a second agreement was reached between South Africa and Portugal regarding rivers of mutual interest to both Angola and SWA — the agreement included the involvement of the Kunene River scheme. In 1969, a third agreement was reached between South Africa and Portugal regarding the construction of supply-side management projects on the Kunene River. This development included the following: a dam at Gové in Angola to regulate the flow of the Kunene River; a dam at Gauaque (upstream from the Ruacana Falls), for further regulation of the river in conjunction with the requirements of the power station to be built at Ruacana; a hydro-electric power station at Ruacana, with a capacity to generate 240 MW of electricity; and a pumping station at Gauaque for irrigation purposes in Owamboland. A fourth dam, at Matala in Angola, was built outside the agreement with the view to generating 40 MW of electricity. In other words, four dams are at present in existence on the Kunene River (Conley 1995:14). A Permanent Joint Technical Commission (PJTC), which is still functioning today, was established within the agreement to oversee the implementation of the different projects along the river (Olivier 1977:126; Best & de Blij 1977:300).

After the infrastructural projects neared completion, it was realised that the Kunene River had further untapped hydropower potential because of several cataracts and waterfalls along its course. After the completion of the Gové and Gauaque Dams, the Kunene River was more easily regulated, and it was therefore technically viable to continue with the development of the power potential of the river downstream from the Ruacana hydro-power plant. In the late 1970s, SWAWEK estimated the future potential of the river to be 1,560 MW of electricity, which could be generated at eight sites along the river (Olivier 1977:128). This forms the backdrop to current developmental plans for another hydro-electric power station at the site of the Epupa waterfall.

Immediately after Angola gained independence on 11 November 1975, a civil war broke out with the participation of both internal and external forces. The war is still raging today (McGowan 1999:233) between the government of Angola and UNITA (the National Union for the Total Independence of Angola). This has had a profound impact on the dynamics of water politics in the Kunene River. Not only was the fighting concentrated in the southern part of Angola, and in particular in Angola’s Cunene province, but the Ruacana hydro-power complex was also seen as an important strategic asset by the warring parties. This was highlighted in 1975, when the civil war was still in its early stages.

South Africa, under Prime Minister John Vorster, was very reluctant at first to become involved in the Angolan civil war. The reason for this, was that South Africa did not want to offend Portugal and international opinion by interfering directly in what was still a Portuguese affair (Barber & Barratt 1990:191). However, after Cuba became engaged in the war on the side of the Angolan government, South Africa got very alarmed. According to Barber & Barratt (1990:189), the Cuban factor had a critical impact on South Africa’s decision to get involved in Angola. Throughout the conflict, the Cuban issue was central to South Africa’s policy on both Angola and Namibia.

South Africa’s first intervention in the Angolan conflict was in August 1975, when the South African Army went into Angola to protect the joint Kunene River project at Gauaque. Clashes between the MPLA (Popular Movement for the Liberation of Angola and UNITA), and harassment of workers at the dam site by the MPLA and UNITA, drew South African troops into Angola to occupy and defend the dam (Barber & Barratt 1990:191; Christie 1975:31). The harassment of workers led to a halt of work on the Gauaque Dam and gave rise to the possibility that water to Owamboland would be cut (Steenkamp Best & de Blij 1977:380). The action by the South African Army at that time, highlights the strategic importance of the Ruacana-Gauaque scheme for SWA/Namibia, as well as South Africa’s hold on the territory. It should be made clear that South Africa intervened in the Angolan conflict not only in order to take possession of Gauaque and to defend the water resources of SWA/Namibia. The reasons that South Africa initially intervened in the war had to do with South Africa’s own security concerns. Three aspects had an impact on this concern: Soviet and Cuban involvement, the threat to Namibia, and the threat also to the Kunene River project. The underlying motive, according to Barber and Barratt (1990:194), was to ensure a non-hostile, cooperative Angola, without Soviet influence, which would not threaten Pretoria’s dominance in southern Africa, particularly in Namibia. The August 1975 Gauaque incident was possibly the catalyst for South Africa’s involvement in Angola, because it gave South Africa a foothold in that country. However, it certainly was not a water war. Other countries also became involved in the Angolan conflict at that time: the Soviet Union, Cuba, the United States, Zambia and Zaire. The Angolan conflict was therefore a classic example of a Cold War proxy military
The dam was cut. The water pipeline to Owamboland was also destroyed. This conflict, fought along the ideological lines of the East-West divide, with the Kunene playing a small role. In addition, a number of African leaders — who also feared communist expansion — supported and appealed to South Africa to get involved in Angola. They included Kenneth Kaunda, Mobutu Sese-Seko, Houphouet-Boigny, Julius Nyerere and Leopold Senghor (Barber & Barratt 1990:188, 191-192). No action took place at the Calueque Dam for the remainder of the war, except in 1988. However, it was always a source of friction (Steenkamp 1990:42). Re: that as it may, the outbreak of war in Angola had a very negative effect on the cooperative endeavours between South Africa and Angola with regard to the Kunene River project.

By 1979, SWA/Namibia was considering extending its electricity supply lines to South Africa. The reason for this, was that the Ruacana hydro-electricity scheme was not running at full capacity because of the warring in Angola. The direct cause was that the South African and Angolan governments could not agree on the operation of the project, and work on the project was suspended. Angola refused to close the sluice gates of the Ruacana Dam and also refused to complete the work on the Calueque Dam. As a result, the power plant at Ruacana could only run at 120-160MW capacity (Financial Mail 24 August 1979:739). The power grid between South Africa and Namibia was completed in the early 1980s, after Ruacana proved incapable of producing electricity at full capacity (The Cape Times 22 February 1980:1). This showed how dependent SWA/Namibia was on South Africa for electricity, as well as the importance of the Kunene River project to the country at that time. As the 1980s proceeded, it was still not possible to tap the full potential of Ruacana and Calueque because of the antagonistic relationship between South Africa and Angola. The same thing happened with the Cahora Bassa hydro-electric scheme in Mozambique after the civil war broke out there (Business Day 23 March 1987:6). It is obvious that the Angolan government used the Ruacana and Calueque Dams as a lever to strengthen their position in the war against South Africa. Not completing the project meant that water to Owamboland, and electricity to the rest of SWA/Namibia, could not be delivered. This made South African operations in the war slightly difficult. However, because South Africa extended its power grid northwards into SWA/Namibia, it had a balancing effect on Angola’s leverage.

The strategic importance of the Ruacana-Calueque scheme was again emphasised in June 1988, when Cuban and Angolan forces launched an attack on the Calueque Dam, first by land and then by air. During the attack considerable damage was inflicted on the dam wall and the power supply to the dam was cut. The water pipeline to Owamboland was also destroyed. This was at a time when Owamboland was suffering a severe drought, and negotiations between South Africa, Cuba and Angola were held at different venues in London, Brazzaville, Cairo, Geneva and New York (Die Bauer 29 June 1988:1; Barber & Barratt 1990:342), in an attempt to end the conflict.

During the Braszaville Round of talks, South Africa held negotiations with the Angolan delegation regarding the status of the Kunene River scheme. South Africa pointed out the importance of the project to drought-stricken Owamboland. The Angolan side reacted positively to this notion, and undertook not to cut water and power to Owamboland (Die Bauer 29 June 1988:1). However, the attack took place after Angola’s assurance that the water and power would not be cut. The explanation for this could be the Cuban factor. The Cubans probably wanted to inflict as much damage as possible to the South African forces and convinced Angola to jointly attack the Ruacana-Calueque scheme. At the time a military expert, Mr. Helmoed-Rohmer Heitman, declared that the objective of the attack on the dam was to put it totally out of commission. Heitman added that “what is happening is that the Cubans have added to the bill [of South Africa] for defending Namibia. Perhaps they think if they keep on adding to it, the cost will become so great that South Africa will pull out” (The Star 30 June 1988:5). The assurance from Angola not to disrupt the scheme, indicated that as talks to end hostilities progressed, so did steps to cooperate regarding the development of the Kunene River. It also showed the importance of the Ruacana-Calueque scheme, not only to Namibia, but also to Angola. Bilateral cooperation in the Kunene River could start anew, following the withdrawal of South African and Cuban forces from Angola. However, the spectre of Angola’s continuing civil war, and the external involvement of outside parties, added a new dimension to water resource cooperation in the Kunene River basin during the 1990s.

Outbreak of peace and renewed cooperation: 1989-2000

Following the implementation of the United Nations Resolution 435 and the election of the Namibian constituent assembly seven months later (Barber & Barratt 1990:344), peace finally broke out in Namibia and Angola in April 1989. The two countries were quickly out of the starting blocks to reinvigorate the Ruacana hydro-electric scheme. In May 1989, delegations from Angola and Namibia met in Windhoek to re-activate the 1969 agreement between
South Africa and Portugal. The purpose of the meeting was to discuss the setting up of a Joint Technical Committee (JTC) and to formulate plans to repair the Gové Dam, which was damaged during the war. In June 1989, a second meeting in Luanda set out to discuss the damage to the Gové Dam. Foreign assistance for the repair of the structure was also discussed, as it was difficult for Angola to raise the money internally because of the war. In July 1989, the Administrator General of SWA/Namibia approved the Namibian component of the JTC. The JTC met for a third time that same month to start planning the reactivation of Ruacana.

After Namibia gained independence in 1990, the stage was set for greater cooperation between the two bordering countries with regard to the Kunene River. The two governments could start with the socio-economic reconstruction of Angola and Namibia as they saw fit. The government of Namibia realised that the country needed electricity to power its numerous mining operations and deliver employment to its people. Consequently, a number of coping strategies were considered in order to achieve this. However, these coping strategies also required written agreements with Namibia’s neighbours.

On 18 September 1990, Namibia signed two separate agreements with Angola concerning cooperation over the Kunene River, as well as cooperation in general between the two countries. One of the agreements concerned reactivating the three previous agreements between South Africa and Portugal in 1926, 1964 and 1969 respectively. This agreement had a number of purposes:

- To conclude the uncompleted Ruacana-Calueque water scheme.
- To establish a Joint Operating Authority, which would be tasked with ensuring maximum beneficial regulation at Gové for optimum power generation at Ruacana. The authority would also control the withdrawal of water along the middle reaches of the Kunene, and ensure the continuous operation and adequate maintenance of the water pumping works at Calueque, as well as the diversion weir at Ruacana.
- To allow the Permanent Joint Technical Commission, established in the 1969 agreement, to evaluate the development of further schemes on the Kunene in order to accommodate the present and future needs for electricity in both countries (Agreement 1990a:1-2).

The other agreement between Namibia and Angola created the Angola-Namibian Joint Commission of Cooperation (Agreement 1990b). The commission was to deal with joint cooperative endeavours regarding a number of issues, one of which was water. This commission was in response to the friendly relations that existed between Angola and the South West African People’s Organisation (SWAPO) in the years prior to Namibia’s independence (Agreement 1990b:2). Consequently, five written agreements on shared water resources exist between Namibia and Angola, one of which relates to general cooperation between the two countries. These agreements bode well for peaceful interaction in the water sphere.

These two agreements demonstrate not only the importance of international rivers to Namibia’s socio-economic well-being, but also to the relationship between the two countries. The linkage between these two agreements also highlights the fact that the overall relationship between countries sharing a river, can be a decisive factor in determining the kind of interaction one can expect between them when it comes to sharing the river’s resources. In this case, Namibia and Angola’s friendly relationship meant that cooperation in the field of water resources would follow as a matter of course.

With these agreements in place, Namibia and Angola could start with coping strategies in the water resource sector, in order to develop their socio-economic outlook. However, the water politics in the Kunene River basin took a dramatic turn in the early part of the 1990s. Firstly, the internal conflict in Angola took a turn for the worse after the breakdown of the Lusaka Accord, which was signed between the belligerent parties. Secondly, a new kind of actor arrived on the scene that elevated the dynamics of water politics to a new level.

Continuing conflict in Angola and new kids on the block

This section looks at the effect of the continuing conflict in Angola in the 1990s, as well as the involvement of non-state entities in future projects on the Kunene River. The only water project Namibia and Angola are pursuing at present is the Epupa hydro-electric scheme at the Epupa Waterfall. The two aspects identified in this portion of the paper – the war in Angola and involvement of non-state actors – have had a distinctive impact on the water politics of the Kunene River. These factors continue to influence the decisions of the two governments regarding the Epupa scheme, and they also (and this...
is especially true of the non-state entities) cast the interaction of the Kunene hydropolitical game in a different light.

**Angola's ongoing civil war**

After the end of the Cold War, the conflict in Angola seemed to be on the wane and the Bicesse Accords were signed by the warring Angolan parties in 1991. However, the Accords were never fully implemented because UNITA challenged the result of the presidential elections held in 1992 (Boulden & Edmonds 1999:130). The second phase of Angola's conflict started at the end of October 1992 and lasted officially until 20 November 1994, when the Lusaka Protocol was signed in the Zambian capital on behalf of President José Eduardo dos Santos and Dr Jonas Savimbi. Negotiations regarding the Protocol had taken just over a year, following UNITA's announcement of a unilateral ceasefire in Abidjan on 14 September 1993 (Cleary 1999:145).

When the ceasefire broke down, renewed fighting erupted between the FAA (Forças Armadas Angolanas) and UNITA. The government ignored UNITA's termination of hostilities, disregarded the ensuing peace negotiations in Lusaka and deployed new weapons and better trained units against cities held by UNITA (Cleary 1999:146). The renewed fighting had a devastating effect on the economy of Angola. As Cleary (1999:146) put it: 'What little was left of Angola's economy after almost 16 years of civil war was destroyed between 1992 and the end of 1994. The GDP declined by 70% over three years; total external debt, as percentage of GDP, almost quadrupled; as did military spending, while social expenditure was halved.' Not only is Angola suffering from severe economic dislocation, but a landmine problem also increases the seriousness of the country's economic woes. Approximately five to eight million mines were planted across the country, but nobody knows how much land is affected (Boulden 1999:131). The landmine and economic problems of Angola certainly have a negative effect on the country's water resource management strategies. The economic situation makes it difficult for Angola to find money to launch new water development projects, not only internally, but also for international projects. Landmines make it very difficult for the agricultural sector to be developed to its fullest potential. Consequently, adaptive capacity is at its lowest level and coping strategies cannot get off the ground — except perhaps if Angola goes into partnership with neighbouring countries. For instance, tap water supplied to towns is not potable and cholera is an ever-present threat. Visitors to Angola are warned not to drink the water. The water supply is in need of upgrading, as water supply stoppages are an almost daily occurrence in Luanda. Only 32% of Angola's population have access to safe water and only 16% have adequate sanitation facilities (SADC 1999:127). This is a grim outlook indeed. The war, which is still raging today, has not only had a negative effect on water resource development across the whole of Angola, but is also hampering the proposed Epupa scheme.

The decision as to whether or not to build a dam at Epupa Falls or Baynes Mountain lies with the Namibia-Angola Permanent Joint Technical Commission (PJTC). During 1998 and 1999, numerous meetings of the PJTC — organised to discuss the proposed projects on the Kunene — had to be postponed because of the security situation in Angola (Internet: The Namibian 25 June 1998). The war was not the only factor delaying the decision on the Epupa Dam. The PJTC had to put off a decision about the project in July 1998, after it found that the feasibility study on the project was incomplete (Internet: The Namibian 10 July 1998). In 1999, the PJTC decided that a meeting should be held in 2000 to make a decision on the Epupa project. The postponement of the decision caused a lot of frustration on the Namibian side, because if the Epupa Dam is further delayed, the cost of the dam could rise and make it unprofitable. A number of projects, like the Halt copper mine and Scorpion zinc mine, could also be affected, and consequently, the long-term economic outlook of Namibia (Internet: The Namibian 23 August 1999). The war in Angola has therefore an indirect impact on Namibia's socio-economic prosperity. At the same time, Namibia and Angola have not seen eye-to-eye on the sites of the proposed dam. Angola favours Baynes Mountain, and Namibia the Epupa Falls site. The Angolans' argument is that if a dam gets built at the Baynes site, then it will mean that the Gové Dam, which was damaged in the civil war, could be renovated. This in turn would bring much-needed development to Angola's Huambo province. Namibia, however, would like to see a dam built at Epupa. The Baynes site, they argue, is too small, despite its environmental and social advantages. The Epupa site is regarded as a prestige site by Namibia (Internet: The Namibian 13 July 1998). A dam at Epupa will also be larger than one at Baynes. The Epupa Dam will be the third-largest dam in Africa, and this holds the promise of much status and prestige for Namibia.

In September 1998, fierce fighting between UNITA and Angolan
government police forces broke out at the Gové Dam. The fighting was caused by a dispute over control of the installation (Internet: The Namibian 11 September 1998). The battle at Gové Dam shows that taking control of a water installation is only one strategy which belligerent parties use to gain advantage in an armed conflict. Whatever the purpose of the battle, it has certainly had a severe impact on a future dam at Epupa, as well as Angola's arguments for a dam at Baynes.

There seems to be a linkage between the damaged Gové Dam, the postponement of the decision about building a dam at Epupa or Baynes, and Namibia's sudden involvement in the Angolan conflict in December 1999. The Namibian President, Sam Nujoma, said that Namibia would back the Angolan government in its campaign against UNITA. The reason for this decision is the long-term friendly relationship between Namibia and the Angolan government (Internet: Mail & Guardian 15 December 1999). It seems as though the cooperation between Namibia and Angola regarding the war against UNITA, is pay-back for the support Angola showed SWAPO in its struggle against South Africa and UNITA in the 1970s and 1980s. It could also become a bargaining chip for Namibia in the upcoming decision on the site for the proposed dam on the Kunene. Also, the fighting reportedly occurred more to the west, away from the Kunene River and in the region of the Okavango River. It could have been a strategy by Namibia to contain the fighting in that area, and keep it away from the Kunene basin and its strategic water installations. Should UNITA gain ground again and project the conflict towards the Kunene River basin, it could spell trouble for any proposed project on the river. Namibia's actions in Angola and the Democratic Republic of Congo (DRC) do not go unnoticed by the international community. If donor agencies perceive the financing of a dam on the Kunene as a severe risk, Namibia could find it very difficult to secure money for the project. Owing to Namibia's perceived negative image, governments of such donor institutions could also influence them not to supply money to Namibia.

The war in Angola will, as long as it continues, have an impact on any international project on the Kunene River. However, military confrontation is not the only type of interaction that influences the hydro-politics in the Kunene River. In the mid-1990s, the dynamics of the hydro-political game in the Kunene River took on a new dimension with the appearance of a different kind of actor — the non-governmental organisation (NGO) or interest group.
Richard Meissner asked the IRN to get involved in the debate. Since then, a number of international NGOs, each with different agendas, have become embroiled in the Epupa Dam debate, together with local groups. At the local level, the Himba community organised the Epupa Action Committee (EAC) in 1997. Other Namibian interest groups are: the Legal Assistance Centre (LAC), Earthlife Africa-Namibia, the National Society for Human Rights (NSHR) and Greenspace. The Democratic Turnhalle Alliance (DTA), the main opposition party in Namibia, is also involved in the debate about the proposed dam. The most notable international interest groups are: the IRN, Environmental Defence (ED), the Association for International Water and Forest Studies (FIVAS) from Norway, Survival International from the UK, and a large number of NGOs from South Africa, most notably the Environmental Monitoring Group (EMG), Earthlife Africa (ELA) and the Southern African Rivers Association (SARA). In South Africa, the Green Party also threw its weight behind the anti-dam lobby. The NGOs work together in a sort of loose coalition and have contact with each other on a regular basis (Lori Pottinger, personal communication). The interest groups are not merely against the proposed dams for the sake of opposition alone. Alternatives have also been proposed. These include wind and solar power, the Kuudu Gas thermal power station with desalination capabilities (Meissner 1999:82), and the importation of electricity from South Africa, which, it is argued, would be cheaper than the Epupa hydro-power scheme (Sadie 1998:285). Most of these tactics are being used by interest groups in their fight against the proposed Epupa hydro-electric dam.

Two types of NGOs are involved in the politics of the Kunene River: those that operate within the national status quo (Shepherd 1996:424), and those that operate across international borders. The latter are characterised by organised activities occurring simultaneously in a number of countries, and by objectives that do not relate to the interests within any given territory (Hoblit 1995:61). It seems as if the latter group of NGOs is the most vociferous in its campaign against the proposed Epupa Dam.

Non-governmental organisations became involved in the Epupa Dam debate in 1995, after an anthropologist, Christa Coleman (who worked with the Himba in that region) highlighted the plight of the Himba, should the Epupa Dam be constructed (Internet: Coleman 1995). The reaction of Coleman in raising the awareness of the Himba was, in fact, the initial trigger event that set the ball rolling. A second trigger event occurred when Earthlife Africa-Namibia (ELA) contacted the International Rivers Network (IRN) and asked the IRN to get involved in the debate. Since then, a number of international NGOs, each with different agendas, have become embroiled in the Epupa Dam debate, together with local groups. At the local level, the Himba community organised the Epupa Action Committee (EAC) in 1997. Other Namibian interest groups are: the Legal Assistance Centre (LAC), Earthlife Africa-Namibia, the National Society for Human Rights (NSHR) and Greenspace. The Democratic Turnhalle Alliance (DTA), the main opposition party in Namibia, is also involved in the debate about the proposed dam. The most notable international interest groups are: the IRN, Environmental Defence (ED), the Association for International Water and Forest Studies (FIVAS) from Norway, Survival International from the UK, and a large number of NGOs from South Africa, most notably the Environmental Monitoring Group (EMG), Earthlife Africa (ELA) and the Southern African Rivers Association (SARA). In South Africa, the Green Party also threw its weight behind the anti-dam lobby. The NGOs work together in a sort of loose coalition and have contact with each other on a regular basis (Lori Pottinger, personal communication). The interest groups are not merely against the proposed dams for the sake of opposition alone. Alternatives have also been proposed. These include wind and solar power, the Kuudu Gas thermal power station with desalination capabilities (Meissner 1999:82), and the importation of electricity from South Africa, which, it is argued, would be cheaper than the Epupa hydro-power scheme (Sadie 1998:285). Most of these tactics are being used by interest groups in their fight against the proposed Epupa hydro-electric dam.

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In March 1997, the DTA sided with the interest groups, after the party made it clear that it would do everything in its power to stop the Epupa Dam, including an attempt to block the financial assistance which the government or Nampower might seek in order to build the dam. The Legal Assistance Centre (LAC) warned the government that it would use litigation if it defended its decision to go ahead with Epupa. The LAC also threatened litigation if complaints by the Himba were not properly addressed. The National Society for Human Rights (NSHR) called on the government to treat the issue with extreme caution if it wanted to avoid bloodshed (Internet: Pottinger 1997). The Deputy Minister of Mines and Energy, Jesaya Nyamu, said that the dam would be built, irrespective of the outcome of the feasibility study. In July 1997, the anti-dam lobby in Namibia was given a great boost when Hikunimue Kapika and Paulus Tjavara made a visit overseas. The chiefs visited Germany, Belgium, Great Britain, Norway and Sweden. They met with members of the German Parliament, European Union Ministers and managers of financial institutions, as well as NORAD and Norconsult, the Norwegian organisation that sponsored the Epupa feasibility study. A press conference was held after their arrival in Windhoek. Seven overseas organisations who sponsored the chiefs’ visit sent a letter to President Nujoma, urging him not to build another dam on the Kunene. The Ministry of Mines and Energy responded angrily to the visit and called it a ‘well organised farce’. The Ministry also said that the chiefs were used by ‘environmental extremists’ in the West. At its African conference, Earthlife Africa passed a resolution condemning the proposed Epupa Dam (Internet: Earthlife Africa 1997).

The draft feasibility study was completed in October 1997, and the Himba people were asked to comment on it, but they still opposed the dam in principle (Internet: International Rivers Network 1997). In November 1997, the EAC sent a letter to the President of Finland, Martti Ahtisaari, asking him to advise the Namibian government not to go ahead with Epupa and to consider alternative options of power generation (Internet: Letter to President Martti Ahtisaari 5 November 1997). In December 1997, a letter was sent from the Society for Threatened People to NORAD and Norconsult, asking them to stop supporting the dam (Internet: Letter to NORAD and Norconsult 19 December 1997). A number of independent scientists reviewed the feasibility study at the end of 1997. In general they found that, inter alia, the study was not up to standard (Internet: International Rivers Network 1998). A public hearing was held in Windhoek on 6 and 7 February 1998. Submissions were handed in by both the IRN and the EAC, which pointed out the negative effects of the proposed dam on the Himba. The IRN released a press statement in which they reported on the feasibility study in general. The press release, echoing the conclusions of the experts who reviewed the study, stated that the investigation was ‘riddled with incorrect conclusions, false assumptions and missing data’, and that this meant ‘that it cannot be used as a basis for a well-informed decision on the project’ (Internet: International Rivers Network 1998). The World Bank and the European Union also had strong reservations about the viability of the project (Internet: The Namibian 1 June 1998).

One of the most peculiar responses from the Namibian government were the gifts of a four-wheel drive ‘bakkie’ (pick-up truck) and a speed boat to the Himba community. Whether or not these donations were a strategy on the part of government to reverse Himba opposition to the Epupa debate, is a matter for debate. If they were, they did not serve their purpose: the Himba community reiterated their anti-dam stance after the gifts were received (Internet: The Namibian 2 June 1998; 2 July 1998). Gifts were not the only government response to NGOs involved in the Epupa debate. In June 1998, President Sam Nujoma launched a scathing attack on the opponents of the Epupa Dam. He also warned foreign nationals in Namibia who ‘disturbed the peace’, that they would be ‘deported’, ‘got rid of’ or ‘dealt with’, with ‘immediate effect’. The LAC came under severe criticism from the President (Internet: The Namibian 22 June 1998). This reaction gives some idea of the strained relations between the government and the NGOs, and also demonstrates Namibia’s insistence on going ahead with Epupa. The utterance of the President was the spark in the powder keg which unleashed a fierce debate in Namibia. Other NGOs and the DTA defended the LAC. The President was the spark in the powder keg which unleashed a fierce debate in Namibia. Other NGOs and the DTA defended the LAC. The President was the spark in the powder keg which unleashed a fierce debate in Namibia. Other NGOs and the DTA defended the LAC. The President was the spark in the powder keg which unleashed a fierce debate in Namibia. Other NGOs and the DTA defended the LAC. The President was the spark in the powder keg which unleashed a fierce debate in Namibia. Other NGOs and the DTA defended the LAC.
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17 March 1999). In the same month, the Minister of Mines and Energy, Jessaya Nyamu, indicated that a referendum could be held in the Kunene region to decide whether the controversial Epupa Dam should go ahead (Internet: The Namibian 29 March 1999). If a referendum is held on the Epupa issue, it will be a move in the right direction and would reduce possible internal conflict in Namibia.

The interaction between the different actors in the Kunene River basin has, since 1926 passed through phases of conflict and cooperation. However, the strategies and tactics of the different national and international NGOs continued during the last part of 1999. In August, the loose coalition of NGOs sent a letter to Getinet Giorgis of the African Development Bank (ADB), urging the ADB not to finance the Epupa Dam, if indeed they were considering doing so. The letter was signed by 42 organisations and 17 individuals (Internet: Letter to Getinet Giorgis 1999). Of the 42 organisations, more than half (23) were from South Africa, while five were from the UK and three from Namibia and Germany. This letter coincided with a briefing document sent to President Thabo Mbeki from the Environmental Monitoring Group (EMG), just before his visit to Namibia in August 1999. In the document the negative effects of the dam (in terms of the environment and the Himba community) were highlighted. The briefing document echoed Mbeki’s vision of an African Renaissance and emphasised the importance of the minority human rights of the Himba. The letter also stated that the proposed Epupa Dam was undermining the progressive development of Namibia, and was contrary to South Africa’s own self-interest in southern Africa (Internet: International Rivers Network, 1999). This shows that the NGOs are doing everything in their power to stop the Epupa Dam. It also indicates the link between government and citizens, and the democratic processes that are involved in lobbying for a certain issue. The letter and the briefing document are further steps in the internationalisation of the Epupa debate and indicate the initiatives which NGOs can take to advance their stance on an issue.

The interest groups pulled out all the stops, and used every forum possible to prevent Epupa from being constructed. In November 1999, the EAC and the LAC presented the case of the Himba before the World Commission on Dams (WCD) during a hearing in Cape Town. The WCD heard about the negative effects the dam could have on the Himba community. Andrew Corbett, from the LAC, also told the hearing that numerous meetings of the EAC in Namibia had been broken up by armed police (Internet: Cape Times 12 November 1999).

National and international NGOs have a profound impact on supply-side management projects in developing countries. At this stage, the lobbying activities are well organised and peaceful, and should not turn violent in the near future. Yet, as long as the Epupa Dam is on the cards, the interest groups will keep up their campaigns against it.

Conclusion

The interaction between the different actors in the Kunene River basin has, since 1926 passed through phases of conflict and cooperation. However, the Kunene River was not the direct causality in the periods of conflict. The chronological study shows that a number of factors – most importantly ideological differences between the actors during the Cold War – contributed to the conflictual state of affairs during the period 1975-1989, with the waters of the Kunene playing a small role. The last-stage of the relationship between the two neighbouring states is characterised by a larger degree of cooperation than has been demonstrated in the past. The good and solid relationship between Namibia and Angola is the reason for this, and this factor will always bode well for water politics in the Kunene River basin. The only bone of contention is the dam sites for the proposed dam on the Kunene. In all likelihood, if the issue of the dam sites persists into the future, the issue will be resolved peacefully. Initially, negotiations at ministerial level would be held between the two respective ministers who are concerned with the issue. Should these fail, talks will be held on a presidential level between Dos Santos and Nujoma. After this option has been exhausted, Namibia and Angola will move on to mediation and arbitration. However, it is envisaged that the issue will be resolved at presidential-level negotiations, if indeed, it should even come to that.

The role and involvement of national and international NGOs are of such a nature, that the issue of the Epupa Dam will continue to go against the grain of the non-state actors well into the future. One thing is certain, and that is that the interest groups in the Kunene River basin are here to stay, and will dog the Namibian government and influence other actors (like financial institutions) until the two countries either cancel the dam, or go ahead with it irrespective of the anti-dam lobby. The interest groups in Namibia are using peaceful means to advance their opposition to Epupa. If the Namibian and Angolan governments press ahead with the construction of a dam, the loose coalition will step up its campaigns against the governments, especially Namibia, which is seen as the driving force behind the new dam. If Namibia
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According to Coleman, President Sam Nujoma put an effective halt to the debate on the topic of the Epupa Dam by declaring that any civil servant opposing the plan would be fired (Internet: Coleman 1995).

The IRN was established in 1985 by Philip Williams, who had for years helped environmentalists trying to stop water projects in California (McCully 1996:307). The IRN's policy regarding the involvement in large dam projects abroad is that a local interest group should first contact the organisation before they will lobby the issue. The reason for this is that the IRN, like any organisation, has limited resources at its disposal and cannot get involved in large dam debates everywhere.

Will there be a water war in the Kunene River basin? If the Sidudu/Kasikili island dispute between Namibia and Botswana is taken as a yardstick for the way disagreements will be handled in southern Africa, then it bodes well for the peaceful resolution of water disputes. Also, the relations between the countries in southern Africa, and between Namibia and Angola in particular, are quite peaceful. These friendly relations are crucial to the prevention of conflict in the arena of hydropolitics. In conclusion, then, a water war, as defined in this paper, has not occurred in the Kunene River basin in the past, and the likelihood that it may occur in the future is very remote.

Footnotes

1 It was the hawkish Defence Minister P.W. Botha who, at a cabinet meeting in 1978, insisted South Africa become more directly involved in the Angolan war. The cabinet was overwhelmingly in favour of South Africa's involvement and Vorster had to give in to the hawks (De Klerk 1998:25-26).

2 The Portuguese ambassador to South Africa protested against the action by South Africa on the Calueque Dam, but no assurances could be given by him with regard to the safety of the workers and the pump station, and the South Africans remained at Calueque (Steenkamp 1990:39).

3 When litigation is used by an NGO or interest group it will not necessarily mean that a lawyer will be hired. Many interest groups and NGOs in the North employ their own legal experts and teams of lawyers, whose purpose is to articulate the interest of the organisation through litigation.
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The Cape Times, 22 February 1980, ‘SA Link to take Power to SWA’.

The Namibian, 1 June 1998, ‘Survival Raps Dam Decision’.


The Namibian, 2 July 1998, ‘After the 4WD Comes the Boat...’.


