

ISSUES IN BRIEF

Five Challenges to the Future of Transboundary Water Governance



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Along the banks of the Okavango River in Southern Africa, elephants, zebras, and hippopotami forage for food and sip from the cool, untainted waters. Fish, crocodiles, and birds take refuge in papyrus plants, and lions stalk their prey among the tall reed grasses that grow waist-high in the wet season. However, it is not only wildlife that inhabits the area surrounding the Okavango. Humans also live in this delicate ecosystem — and their numbers are increasing. The population in the river basin is projected to increase by more than 40 percent by 2050, and resource scarcity is a major concern (OKACOM 2014). This issue is not unique to the Okavango. Throughout the developing and industrialized world, water managers are making tough decisions regarding the distribution and conservation of this vital, life-sustaining resource.

In recent decades, community-based programs have flourished as efficient models for interstate river management (Mbaiwa 2004). These organizations

— hybrids between

traditional top-down forms of environmental governance and indigenous knowledge systems — are often better positioned than state governments to address details involved in the complex management of international rivers (Kgathi 2002). Although localized water management schemes have been successful in recent decades, communities now face basin-wide challenges that they cannot address alone. Transboundary institutions such as the Permanent Okavango River Basin Water Commission (OKACOM) are now integral to the planning and distribution of water between and within state boundaries. Rather than abandon community-based organizations, these regional groups must work with them to

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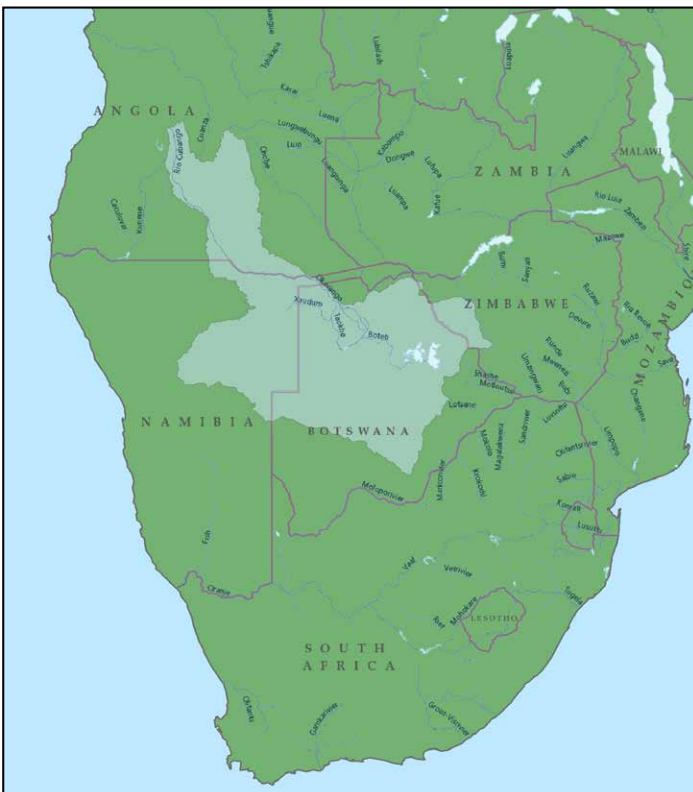
create a holistic framework for addressing challenges associated with allocation, financing, communication, and effective governance within and across borders.

The integration of these two management systems is vital to the sustainable development of the Okavango Basin. Management of such a complex river system requires the active involvement of individuals who work at all levels, from local to global, to ensure that water-consumptive infrastructure development can occur alongside conservation-based development and ecotourism. Moreover, community involvement in resource management has benefits above and beyond economic development. Inclusion of stakeholders in the decision-making process for water resources increases local resilience to disaster events such as floods and droughts, promotes social wellbeing through increased access to resources and infrastructure, and fosters the development of a strong and independent civil society that demands political representation and accountability from governments. Lessons learned from the integration of management systems in the Okavango are largely transferable to other international river basins and could highlight key components of sustainable water management for the longer-range future.

Experimental Governance in the Okavango Basin

The Okavango River is the confluence of tributaries and streams from the Cubango and Cuito Rivers that begin in central Angola, cross the Namibian panhandle, and eventually deposit into the Kalahari Desert in Botswana. A full 1900 km in length, the Okavango results in one of the largest inland deltas in the world. Approximately 95 percent of the 9.4 billion cubic meters of water that flows through the river comes from precipitation in the Angolan catchment, which flows south for almost four months before reaching the delta. This time lag, which is due to a gradient of only 60-meters for the entire length of the river, is imperative to supporting life in the arid southern region. Here, water enters the Kalahari Desert during the dry winter months and creates an oasis that supports a diversity of wildlife, plants, and human communities (Mendelsohn et al. 2010).

Figure 1: The Okavango River Basin

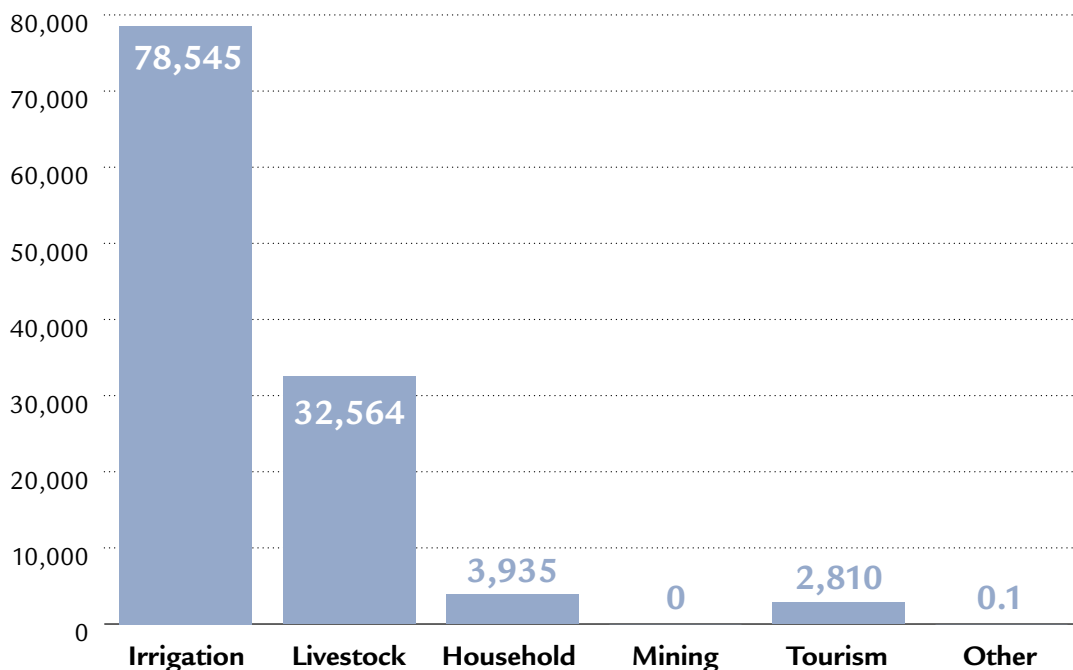


Data Source: Rivers Network (Map by Author)

While exact statistics on water use are difficult to obtain in the Okavango, it is clear that population growth and socioeconomic development are shifting the balance of supply and demand for water from the river. Roughly 900,000 people currently inhabit the basin: 57 percent reside in Angola, 25 percent in Namibia, and 18 percent in Botswana. Approximately 62 percent of inhabitants live in rural areas, while 38 percent live in urban centers along the river. Within a decade, 1.28 million people are projected to inhabit the basin, many of them flocking to urban areas such as Maun and Menongue where socio-economic development results in higher household water consumption per person. Houses in urban areas that are directly connected to water points use approximately 50 liters of water per person per day, while those in rural areas where residents must gather their water from distant wells use only 25. Agriculture is the most dominant use of water in the Okavango, accounting for 83 percent of total withdrawals. Other uses include livestock maintenance, mining, and water consumed at tourism facilities. Ecosystem and wildlife maintenance requires additional water reserves; however, these statistics are largely unknown at the basin-wide scale (FAO 2014).

Excluding water for ecosystem maintenance, the uses listed above constitute only 90 million cubic meters, or one percent of available water supply. While the future of development in the basin remains uncertain, growth predictions for the coming century estimate that as much as 39 percent of available supply may be extracted. This is particularly worrying in an environment as variable as the Okavango, where seasonal floods and droughts result in dramatic changes to flow. Whether this level of development could be sustained during drought periods is uncertain at best, and may coincide with climate change driven increases in temperature that will raise the already high rate of evaporation in the delta. The resulting decrease in the value of downstream tourism would almost certainly be detrimental to communities, wildlife, and the ecosystem as a whole (FAO 2014).

Table 1: Average Annual Okavango Basin Water Use (2008–2011), by Sector (1000s of m3)



Data Source: Food and Agricultural Organization of the United Nations, 2014

*Note: Tourism values include only water consumed at facilities and do not account for resources necessary to maintain wildlife populations.

Coordination at the local, state, and regional level is necessary to manage the complexities of a river the size of the Okavango. To address this, Angola, Namibia, and Botswana came together in 1994 to create OKACOM, a regional advisory body that works with state governments and non-governmental organizations to collect and share information on the sustainable use of water in the basin. OKACOM is composed of a Commission tasked with creating policy recommendations, a Secretariat that facilitates information flow between groups, and three steering committees that conduct technical studies on issues related to the political institutions that manage water, the hydrology of the river, and biodiversity in the basin. Soon after the founding of OKACOM, conservation groups from Namibia and Botswana came forward to present the Commission with the *Every River has its People Initiative*, a program aimed at providing communities with the skills and tools to participate in the management process. Eager to garner stakeholder involvement, OKACOM agreed to recognize the authority of community trusts and offered observer status to representatives

from these communities through a “basin-wide forum.” In the last decade, community-based water management groups — known in the Okavango as community trusts or water point committees — have become increasingly important to management. The groups are recognized by both OKACOM and state officials as legitimate governing bodies, and while important resource decisions are still made mostly at the state level, the trusts represent the interests of stakeholders in the policy process (Mbaiwa 2004).

Alongside representation, community management groups in the Okavango have the dual objective of providing public services while also promoting programs for conservation. Since the advent of community-based water management in Namibia, rural access to drinkable water has increased from 75 percent to 91 percent and urban access has improved from 95 percent to 98 percent (UN Mission to Namibia 2011). Trusts educate communities on the

sustainable use of resources, offer them an outlet for involvement in the political process through monthly or semi-annual community meetings, provide employment through water and tourism-based enterprises, and in some regions are actively involved in providing income to villages through the sale of licenses. These ventures can be highly lucrative. In the delta region where tourism is the most prominent, community groups generated 4.8 million Pula (US\$800,000) in 2001 through tourism contracts and partnerships with safari

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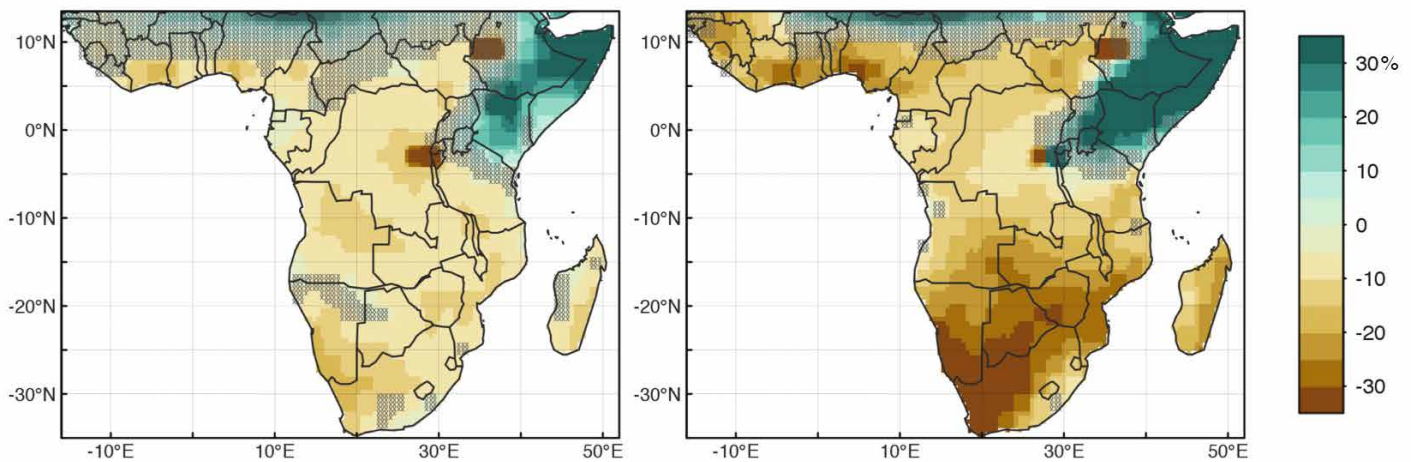
operators, the sale of hunting licenses, and the sale of hand-made crafts. The same year, more than 800 local inhabitants obtained employment through community-based projects and partnerships (Mbaiwa 2004).

Undoubtedly, the stable and healthy flow of water throughout the Okavango River is imperative to both the socio-economic as well as the ecological wellbeing of the basin. The delta is home to over 630 different species of wildlife and more than 3,000 species of plants — many of which are unique to the area (Mendelsohn et al. 2010; Mbaiwa 2004). While the distribution of water and financial assistance to communities is important for development, conservation of wildlife and natural resources is necessary to ensure development can continue in the future. Because Southern Africa is a place of extremes, water managers in the Okavango face a highly variable environment where multi-scale coordination is challenging and necessary, particularly as drought continues to plague the region and forces community groups to address increasing local demand for water amid regional uncertainty over the future flow of the river.

Challenges to Future Community-Based Management

Climate change and development will pose a significant challenge to water managers in the Okavango. Increases in temperature coupled with shorter and more intense wet seasons are likely to result in increased aridity in the basin, regardless of changes in water usage (See Figure 2 for more details). However, increasing demand for water from the river appears unavoidable. Calls from upstream water users to engineer the river for human use often have the most impact; in rapidly developing Angola, hydropower and massive-scale agricultural irrigation could potentially turn the country into a regional economic powerhouse (Ashton and Neal 2005). Because these challenges will involve multiple communities rather than existing within individual community parameters, the responsibility falls to OKACOM to actively facilitate dialogue between trusts. In establishing a framework for dealing with these basin-wide issues at the community level, five key challenges must be addressed.

Figure 2: Projected Aridity Index by 2°C (left) and 4°C (right) Increase in Temperature, 2071-2099



Note: The figures above represent a multi-model average of the projected percentage change in the aridity index for years 2071–2099 compared to data from 1951–1980 given an increase in the global average annual temperature of 2°C (left) and 4°C (right). A positive percentage indicates increased precipitation, while a negative percentage indicates increased dryness.

Source: World Bank (2013). *Turn Down the Heat: Climate Extremes, Regional Impacts, and the Case for Resilience*

COMMUNICATION: Facilitators at OKACOM must ascertain whether current outlets for communication are effective. Communication between stakeholders at all levels is an important key to successful governance. Devolved management structures are complex in part because they require vertical (individual-community-state-international) and horizontal (community-community, state-state, individual-individual) forms of communication. As the regional institution that manages water in the Okavango, OKACOM functions as a facilitator for dialogue at multiple levels including between communities, states, and regional policy-makers (Mendelsohn et al. 2010). While water managers in the Okavango have recognized the efficiency with which information can be transferred upwards towards OKACOM, they often note the difficulties that exist in communication between community groups. The absence of interaction between trusts puts additional pressure on state and regional actors to coordinate actions at a higher level, ultimately delaying the policy process. For trusts and water point committees in devolved management systems to be able to accomplish their goals, they must be able to effectively communicate amongst themselves.

EFFECTIVE GOVERNANCE: Once lines of communication are open, the first challenge facing community water managers in a rapid-development future is ensuring that governance practices are inclusive, equitable, and stimulating. Stakeholders within communities perceive benefit from self-management when they are actively involved in the process of decision-making (Pienaar 2013). Because of a diversity of cultural, geographic, and political factors, certain parties are often excluded from management while others simply lack the interest in, time for, or access to meetings where resources are discussed. However, excluded communities still affect the basin environment. Historically marginalized groups such as women and minorities must be involved in the future of water management, and institutions must begin to address inequalities in wealth, access to resources, education, and employment. Inclusion also requires connecting remote communities and those in post-conflict settings to the decision-making process. Transportation, protection from danger, and the establishment of meeting times and locations that allow all stakeholders to attend are vital to sustained community management as resources become scarcer. Similarly, non-traditional stakeholders such as youth and refugees who make up a significant portion of the region's population must be involved. Ensuring equity and inclusivity legitimizes community management within the basin and abroad, and fosters support for program outcomes within the communities themselves (Tippett 2005).

Alongside inclusivity and equity in management, community-based organizations must ensure that individual actors remain interested in participating in the decision-making process. One major complaint from stakeholders and participants alike is a lack of reciprocity — stakeholders don't attend meetings or participate in elections, and water managers don't provide usable, relevant information or policies. With help from OKACOM, community management groups must address the challenges of reciprocity. Social learning, and particularly the kind necessary to change consumptive habits, requires active participation above and beyond attendance (Tippet 2005). To maintain interest, trusts and water point committees must train enthusiastic facilitators who use innovative methods of reaching participants and must ensure that individuals have the resources that they need to attend meetings. Similarly, the trusts must distribute benefits equally and must find ways to provide information to individuals that can aid in improving livelihoods. Beyond OKACOM, partnerships with conservation groups, universities, and NGOs could be key in providing more useful forms of information.

FINANCIAL STABILITY: In addition to effective governance, community water management organizations must maintain financial self-sufficiency while simultaneously catering to a growing population. Trusts in the Okavango Basin rely largely on income from two sources: ecotourism and international aid (Green 2012; Mbaiwa 2004). As international institutions begin to withdraw funding from OKACOM following the closure of the *Every River has its People Initiative*, community water managers must find sources of income to sustain their organizations. Ecotourism and environmental partnerships have so far provided stability for communities in the basin, but the strong reliance of these groups on international tourists in an unstable global economy may prove to be a highly problematic as water resources diminish (Katerere 2001). Ecotourism in the Okavango is also financially unstable because these businesses are not locally owned. While some trusts do partner directly with these groups, income and employment benefits are relatively limited and communities must live with the fear that partners will withdraw from the region during economic downturn. While entrepreneurship and locally-owned tourism ventures may offer some additional financial benefits (Domptail 2014), diversification of economic activities outside of tourism will provide communities with the best opportunity for self-sufficiency. OKACOM will again be an important player in this transition, as production and agriculture-related undertakings require significant inputs of water, and will widely affect basin inhabitants.

ALLOCATION: One of the more difficult issues yet to be addressed in the Okavango is the establishment of a framework for basin-wide water allocation. Managing water in a limited resource environment requires striking a careful balance between conservation and growth. Human development is a water-intensive activity, and increased demand for energy and food production puts stress on managers to create efficient systems for resource distribution. Historically, demand for water from the Okavango River is low and formal allocation policies have not been necessary or, in fact, desired. State governments have worked hard to draft policies that avoid basin-wide allocation schemes, which are often considered to be politically rigid and dangerously inadaptable (Green et al. 2012). While these policies have so far succeeded in preventing fixed distribution, plans for development in Angola and Namibia have faced backlash from communities in the lower basin and will likely drive further discussions about formal distribution (Ashton and Neal 2005).

The challenges of mandated allocation are twofold. First, community management groups must determine within their boundaries how best to divide resources between multiple end-uses, a process that requires conflict mediation, bargaining, and settlement. Dialogue among stakeholders within villages is vital to determine where water is needed and where it can be sacrificed. Additionally, water managers at the regional level must address resource distribution between multi-community projects. Proposed hydropower dams, for example,

would impact the whole basin and require cross-sector action on allocation. Secondly, while creating a framework for allocation may be helpful in ensuring access to water, it does not address underlying issues associated with the wasteful use of resources. Quantity allocation could potentially increase the illusion of security and lead to degradation, while distribution of resources based on percent of flow could reduce stability necessary for development. Clearly, resilient water management requires more than redesigning distribution; it requires changing how water is perceived and used. In particular, water managers must address policies of energy production, zoning along the river's banks, agricultural production and irrigation, and the extraction of groundwater for human and livestock consumption (Tippet et al. 2005).

GATHERING AND DISTRIBUTING ENVIRONMENTAL DATA: In order for policies at the basin-wide level to function within the realities of the natural environment, communities throughout the basin must conduct qualitative and quantitative monitoring of resources. Individuals in communities are vital to the collection of this information — researchers, NGOs and universities conduct on-the-ground interviews with residents and involve them directly in the environmental monitoring process (Domptail 2014). However, certain communities — those that are distant from the river, in inaccessible areas, or are seasonally flooded — are often difficult to gain access to. The Angolan catchment, for example, was a site of frequent conflict during the civil war that occurred between 1975 and 2002 (Mendelsohn et al. 2010), and researchers today are prohibited from collecting data because of buried landmines.

Information gathered by trusts must also be redistributed to stakeholders in usable formats. Because of differences in language, literacy, and scientific understanding, this information is most helpful if presented through maps, charts, videos, drawings, and other visual portals. So far, community trusts have lacked resources to provide this service to their constituents. However, regional water managers in the Okavango have put a great deal of time and effort into making information widely available to people who live in the basin. In 2013, members of OKACOM commissioned a children's comic book series that discusses the geography of the river and the need for residents to work together to protect vulnerable water resources (comic available at the OKACOM website). Clearly, water managers at the international level have begun to address the challenge of access to information. However, at the community level, stakeholders still note the overwhelming nature of raw data presented to them (Tippet 2005). As regional water managers petition for increased stakeholder involvement, it is vital that they not only facilitate knowledge transfer between communities, but also train local water managers to work directly with their members to gather and redistribute important climatic and hydrologic data in a manner well suited to the local context.

Conclusion

Because of the sheer size of transboundary river basins, water managers must be present at all scales from local to regional for policies to be effective. As in the Okavango, policy-makers along the Ganges, the Niger, the Colorado, and elsewhere must begin to address the coupled impact of expanding populations and warming climates on water availability. While addressing these issues at the basin-wide scale is important to ensure sustainable solutions to issues of shortage, broad-scale institutions often struggle to monitor the reality of local resource availability. For this reason, communities are vital to effective resource management. However, difficulties exist in successfully integrating communities into regional management institutions. By addressing five major challenges to integration — communication, governance, finance, allocation, and data collection — management institutions can help to build more resilient socio-economic, political, and environmental conditions within their basins. These lessons, taken from the Okavango, can be useful in advancing effective water management in other regions similarly undergoing rapid social and climatic changes. ●



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